

Analysis of Preference Formation Using Experience Information

Tadashi Yagi

Doshisha University, Imadegawa Karasuma, Kyoto, Japan

Email: tyagi@mail.doshisha.ac.jp

How to cite this paper: Yagi, T. (2018) Analysis of Preference Formation Using Experience Information. *Modern Economy*, 9, 484-509.

<https://doi.org/10.4236/me.2018.93032>

Received: February 23, 2018

Accepted: March 23, 2018

Published: March 26, 2018

Copyright © 2018 by author and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

In this paper, we hypothesize that unconscious biases are formed through life experience, and we formalize the process of preference formation mainly focusing on emotional factors. Based on this underlying model, we implement an empirical model and examine the relation between experience and preference formation using a dataset compiled by the NTTDATA Institute of Management Consulting, Inc. The analysis showed that there are strong relations between experiences and preferences, especially when the emotional impact of the experiences seems to be strong. The results of the empirical analysis are consistent with this intuition and give us various insights into the mechanism of preference formation. It is important to note that around 60% to 80% of experiences are statistically significant in explaining the formation of preference, and the number of significant variables increases when the preference is influenced by intense experiences, as is the case for the preference high quality or ecological options. This supports the intuitive idea that emotionally strong experiences have a strong influence on the formation of unconscious biases. This study gives us various kinds of insights into the marketing strategies. Especially, the analysis on the formation of preference by experiences in life helps to provide advertisement information with strong appeal to each consumer.

Keywords

Preference Formation, Experience, Unconsciousness, Emotion

1. Introduction

In this paper, we consider preference formation mainly focusing on emotional factors by analyzing a large dataset that includes information on experiences in life. Our approach is different from that of Tirunillai and Tellis [1], who ex-

tracted the key latent dimensions of consumer satisfaction by using a unifying framework of unsupervised latent Dirichlet allocation. In their approach, rich data on product reviews across 15 firms in five markets over four years were used to reveal the evaluation of products, while our approach uses rich data on the accumulation of life experiences and consumption to examine preference formation. Our idea is that life experiences form an emotional framework, which produces certain kinds of emotional responses to stimuli such as advertisements or consumption experiences.

The article is organized as follows. Section 2 presents the literature review. Section 3 presents a model of preference formation focusing on unconscious processes in the brain. Section 4 gives an outline of the rich data on life experience and presents the results of the analysis of the relation between preferences and life experience. Section 5 discusses the implications of the analysis for the formation of preferences for consumption.

2. Literature Review

Consumer choice is crucially dependent on preference, which summarizes various kinds of information, including unconscious thought processes. In conventional studies of consumer behavior, preference is deemed to be exogenously given. Mainly, preferences have been estimated from realized consumption behavior. “Revealed preference theory” advocated by Samuelson [2] is the pioneering approach for examining preference states. However, revealed preference theory is not fully predictive: it only describes behavior under the current set of circumstances, such as income constraints. Thus it cannot be used to address, for example, the potential change in preferences for luxury goods when income changes. Although rich consumers are more likely to purchase luxury goods than poor consumers, this does not necessarily mean that a poor individual will increase their consumption of luxury goods if their income increases. The experience of having been poor may lead that individual to prefer simple goods through familiarity or the desire “to not waste money”, for example. Thus, in predicting consumer behavior, it is necessary to understand how preferences are formed. Preference formation depends partly on attributes such as age, sex, income, and education. In this paper, we consider how life experience influences preference formation.

In empirical studies, the Linear Expenditure System (Pollak and Wales [3]) and the Almost Ideal Demand System (Deaton and Muellbauer [4]) have been developed to analyze the demand system by using expenditure data. Extensions of these methods have been elaborated to capture the aggregate demand system in the market. These approaches are not aimed at analyzing preference formation. The work of Carpenter and Nakamoto [5] is more in line with our approach. They examined the reasons for the advantages of pioneering products in market competition not only during the initial stage but also during the maturing stage by focusing on the preference formation process.

In recent developments of marketing research, emotion is an explicit subject of focus. Govers and Schoormans [6] analyzed the mechanism for generating diversity in a demand system and showed that the diversity of images of products is generated by combining preference and personality. Xie *et al.* [7] examined the difference in the formation mechanism for preference between a local brand and a global brand and showed that preference for the global brand is based on the presence of some special attribute, while preference for the local brand is based on reliability and affection.

Jiménez and Voss [8] examined the concept validity of emotion and appeal (EA). By employing this new measure, they showed that EA and self-concept maintenance are related. Furthermore, they showed that willingness to pay is predicted by EA. Deshwal [9] focused on the role of emotions when a consumer purchases a product, and argued that emotional marketing can be used as a tool for increasing customer base. Majeed and Usman [10] conceptualized how women respond to emotional advertisements, and developed an ACE model, which is composed of appeal drivers (A), celebrity endorsements (C), and emotions (E). A partial least squares structural equation modeling analysis found that showbiz celebrities expressing the emotion of happiness make the most effective ACE mix for influencing the consumption behavior of women.

3. Model of Preference Formation

3.1. Importance of the Unconscious

As Winkielman and Berridge [11] argued, emotion is genuinely unconscious. They showed in laboratory experiments that this implicit emotion causes emotional reaction unconsciously. Preferences are, therefore, unconscious in the sense that implicit emotions are generated as the result of experiences throughout life. Winkielman *et al.* [12] suggested that preferences are jointly determined by basic affective processes and basic motivational processes, and a triggering affective stimulus can be unconscious. This statement is important in the sense that basic affect interacts with motivation.

We can interpret the above statement in a marketing context. **Figure 1** illustrates the structure of a consumer's decision making when he/she receives certain stimuli. The affective process and the motivational process refer to unconscious thought processes generated as the result of experiences in his/her life. The motivational process consists of the motivations for pursuing reward and for avoiding punishment. Dijksterhuis and Nordgren [13] stressed the importance of unconscious thought in decision making and argued that the precision of decision making improves by relying on the unconscious unless any applicable rules exist. The reasoning behind this statement stems from "the weighting theory", which implies that some weightings are given unconsciously to stimuli experienced, and the affective and motivational processes interact with each other with these weightings (see Dijksterhuis and Nordgren [13]).

To illustrate this structure, we consider the example of an advertisement for a

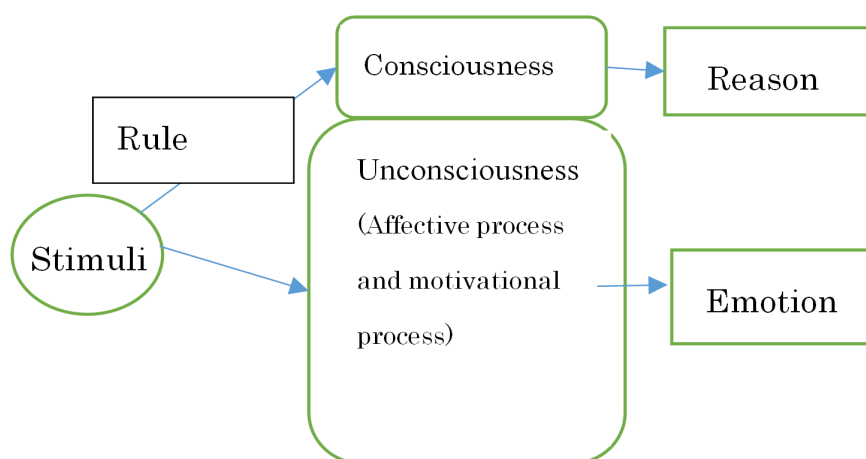


Figure 1. Structure of unconscious thought (color in print).

travel tour. Huge numbers of advertisements for travel tours can be seen in daily newspapers and magazines. It is expected that only rarely will consumers evaluate the price and quality of a travel tour by checking every advertisement. Whether the consumers pay attention to the advertisement or not depends on some unconscious decision making. When a consumer browses advertisements, some advertisement, such as one with a color picture of a beautiful mountain, may stimulate unconscious affection, provoking the consumer to check the price of the tour. Whether the consumer paid attention to the advertisement depends on unconscious decision making, although the behavior of checking price may stem from conscious thought. Checking the price is followed by thinking based on some calculation rule, and an evaluation of the tour could be attained consciously. However, it should be noted that one never evaluates a tour consciously without raising some kind of affection, such as excitement, when receiving stimuli from an advertisement.

In this paper, we hypothesize that unconsciousness is formed as the result of experiences in life. For example, a consumer who once had an experience of positive affection from beautiful scenery unconsciously seeks to repeat that experience, and unconsciously responds positively to similar stimuli. This positive affection is a kind of engine moving the consumer to check the advertisement with the picture of beautiful scenery. In the next subsection, we formalize the process of preference formation. Then, we examine the relation between experience and preference formation empirically.

3.2. Formal Model of Preference Formation

In this subsection, we formalize the process of preference formation based on the hypothesis that preference is formed through the accumulation of experiences in a life. Denote an i -type experience by x_i , and the utility of some item generated by experience x_i at time s by u_{is} . Thus, the utility is given by

$$u_{is} = u(\bullet | x_i(s)). \quad (1)$$

The overall utility formed through the accumulation of experiences up to time t is denoted by $\bar{u}_t(\bullet)$, and it is given by

$$\bar{u}_t(\bullet) = \sum_{s=1}^t \sum_{i=1}^I \omega_i(s) u_{is}(\bullet | x_i(s)), \quad (2)$$

where $\omega_i(s)$ is the unconscious weight given to the i -type experience at time s , and I is the number of types of experience.

In the empirical implementation, we introduce a linear regression model in which preference is the explained variable and types of experience are the explanatory variables:

$$P_{kj} = \alpha + \beta_1 x_{1j} + \cdots + \beta_I x_{Ij} + \varepsilon_j, \quad j = 1, \dots, n, \quad (3)$$

where P_{kj} is k -type preference of individual j , α and β_i are parameters to be estimated, ε_j the error term, and n is the number of individual.

4. Empirical Analysis

4.1. Data

For this analysis, I used a database compiled by the NTTDATA Institute of Management Consulting, Inc., from the results of a survey of human behavior (value judgments, experience in life, financial situation of the household, health situation, personal information, etc.). The survey was conducted from February 24, 2017 to March 13, 2017 and the questionnaire was distributed to 20,955 monitors, 15,794 of which returned their answers (return rate, 75.4%).

The following is the basic information about the total sample. The male ratio to female ratio is 60.2%. The average age is 51.4 with a standard deviation of 12.8. The average personal annual income is 3.87 million Yen (\$35,200) with a standard deviation of 3.73 million Yen (\$33,900). The average household annual income is 6.09 million Yen (\$55,363) with a standard deviation of 3.90 million Yen (\$35,455). The proportion of university graduates is 50.7%.

The value of the average personal annual income of employee given by 2014 Statistical Survey of Actual Status for Salary in the Private Sector of Japan is 4.14 million Yen (\$37,635). The value of the average household annual income given by 2016 Family Expenditure Survey of Japan is 5.54 million Yen (\$50,353). The university entrance rate given by the 2015 Basic School Survey compiled by Ministry of Education, Culture, Sports, Science and Technology of Japan is 51.5%. From these values, we can judge that the sample selected could represent the targeted population.

4.2. Steps of the Analysis

In the first step of the analysis, questions about experience are grouped into types of leisure and cultural experiences. In this step, factor analysis by the principal component method is repeatedly applied to these types of leisure and cultural experiences. In [Appendix 1](#), one example of a factor analysis by the prin-

principal component method is shown.

In the second step, factor analysis by the principal factor method is applied repeatedly to a large number of questions about preferences. The questions are categorized into four groups: clothing, food, housing, and play. The results of the analysis are given in **Appendices 2-5**.

In the third step, we examined the relation between experiences and preferences. After examining the relation, we tried to increase its generality. For this purpose, we reduced the number of variables representing the types of experience by applying the factor analysis to the variables generated in the first step. The result is shown in **Appendix 6**.

4.3. Preference Formation and Experiences in Life

Using the variables on preferences generated by the factor analysis in **Appendices 2-5**, we examine the relation between preferences and life experiences. In the empirical implementation, we introduce a linear regression model based on the model given in Equation (3). The explained variable is the k -type preference of individual j such as preference for high quality and so on, those are denoted by P_{kj} . The explanatory variables are i -type life experiences of individual j , those are denoted by x_{ij} such as friendship experience and so on.

We conducted multivariate regression analysis and the standardized regression coefficients derived from the analysis are listed in **Tables 1-4** and **Figures 2-5**. The linear regression procedure of SPSS version 24 is used for the estimation. By comparing the values of the standardized regression coefficients, we can determine the relative strengths of the influence of experiences on preference. The results of multivariate regression analysis could be judged to be quite robust, because there is no sign of multi-correlation. In addition, the stability of parameters is checked by changing the size of sample used in the estimation.

4.3.1. Clothing Preferences (Table 1 and Figure 2)

1) Wasteful habit

Musical experiences, such as “music and art experience” and “Soul and Reggae”, have a positive influence on wasteful habit. On the other hand, “friendship experience” and “light religious” experience have a negative influence on wasteful habit. These results suggest that “living for the moment” is promoted by music enjoyment and the “long-term-view way of living” is influenced by friendship and light religious experiences.

2) Preference for high quality

It is interesting that traveling for leisure has the strongest positive influence. Sensitivity to high quality is improved by having intense experiences while visiting museums or luxury hotels. Music and art experiences, photography experience, and social network service (SNS) experience also have the positive influence on the preference for high quality. This is interpreted as meaning that exposure to beauty or high-quality works forms the preference for high quality,

Table 1. Standardized coefficients for statistically significant experiences (5% level): clothing.

	Wasteful habit	High quality	Ecology	Frugality	Casual
Age	-0.21		0.152	0.359	0.126
Age squared	0.327	0.099		-0.247	
Monetary assets		-0.021			0.021
Personal annual income	-0.033	0.051		-0.032	-0.034
Household annual income	-0.03			-0.046	
Male dummy	0.093	0.092		-0.044	
High educational attainment	-0.038	-0.025	-0.016		
Leisure experience	-0.026	-0.041	-0.026	0.112	0.128
Light religious experience	-0.04	-0.036		0.059	0.151
Exchange experience	-0.026		0.016	0.08	0.135
Friendship experience	-0.056	-0.035			0.089
Ballard experience		-0.032	0.022		0.033
Deep religious experience		0.024	0.031		
Supplementary school or club activity experience				0.032	0.091
Travel for leisure experience		0.072	0.049	0.016	
Bullying and poverty experience			0.016	0.041	0.044
Music and art experience	0.017	0.02			0.043
Club and friendship experience				0.052	0.061
Western music experience	-0.025	0.026		-0.022	0.034
Photography experience		0.035	0.025		
SNS experience	0.015	0.044		0.032	
Traditional Japanese music experience			0.026		
Soul or Reggae experience	0.031	0.026	0.014		
Family hardship experience	0.018		0.016	0.047	0.025

and SNSs stimulate conspicuous consumption. On the other hand, leisure experience (including play within the house), light religious experience, and friendship experience have a negative influence on the formation of preference for high quality. These experiences also have a negative influence on conspicuous consumption.

3) Ecology preference (*i.e.*, preference for environmental friendliness)

Travel for leisure has the strongest positive influence on the ecology preference. The second strongest positive influence is deep religious experience. Travel is a good opportunity to experience the beauty and wonder of nature. Deep religious experience also strengthens the reverence for nature. It is interesting that only traditional Japanese music experience has a statistically significant effect on this preference. Traditional Japanese music places high regard on nature,

Table 2. Standardized coefficients for statistically significant experiences (5% level): food.

	Gourmet	Natural	Frugality
Age	0.192	0.183	
Age squared			-0.048
Monetary assets	-0.015	0.034	
Personal annual income		-0.052	
Household annual income	-0.04		-0.1
Male dummy	0.088	-0.099	
High educational attainment	-0.044		
Leisure experience		0.097	0.131
Light religious experience	-0.027	0.155	0.038
Exchange experience		0.139	0.036
Friendship experience	-0.056	0.131	-0.032
Ballard experience	-0.016	0.061	0.022
Deep religious experience	0.017	0.024	-0.025
Supplementary school or club activity experience	0.019	0.095	0.025
Travel for leisure experience	0.056	0.016	-0.022
Bullying and poverty experience	0.032	0.045	0.04
Music and art experience	0.033	0.044	
Club and friendship experience	0.017	0.086	0.031
Western music experience		0.051	-0.042
Photography experience	0.023		
SNS experience	0.053		
Traditional Japanese music experience		0.037	-0.026
Soul or Reggae experience	0.036	0.013	-0.024
Family hardship experience	0.043	0.037	0.03

and the essence of the music stems from harmony with nature. It is interpreted that this stance for nature increases the preference for ecological options.

4) Preference for frugality

Leisure experience (including play within the house) has the strongest influence and exchange experience (such as meeting for promoting social human relation) has the second strongest influence on the formation of a preference for frugality. The third strongest factor is light religious experience and the fourth is club and friendship experience. The common feature of these influences would be the experience of joy without spending much money. The fifth strongest factor is family hardship experience, which implies that spending a lot of money is not allowed due to the family situation.

Table 3. Standardized coefficients for statistically significant experiences (5% level): housing.

	Stability	Frugality	High quality	Natural	Second Hand
Age	-0.409	0.265	-0.18	-0.381	-0.213
Age squared	0.694	-0.205	0.249	0.596	0.26
Monetary assets	0.015		0.036		
Personal annual income		-0.04	0.05		
Household annual income	0.044	-0.094	0.097	-0.016	-0.088
Male dummy		0.036	0.036	-0.018	0.037
High educational attainment	-0.019	-0.035		-0.029	-0.019
Leisure experience	0.127	0.102	0.022	0.026	0.063
Light religious experience	0.138			0.04	0.019
Exchange experience	0.156	0.056	0.056	0.048	0.031
Friendship experience	0.121			0.083	
Ballard experience	0.066	0.034		0.062	0.065
Deep religious experience		0.027	0.056	0.057	0.045
Supplementary school or club activity experience	0.105		0.05	0.049	
Travel for leisure experience	0.013	0.038	0.104	0.084	0.064
Bullying and poverty experience	0.026	0.063	0.056	0.031	0.086
Music and art experience	0.05	0.019	0.053	0.048	0.05
Club and friendship experience	0.083	0.025	0.017	0.089	0.033
Western music experience	0.031	-0.032	0.039	0.037	0.055
Photography experience	-0.024		0.098	0.072	0.075
SNS experience		0.048	0.075	0.021	0.031
Traditional Japanese music experience			0.057	0.023	
Soul or Reggae experience	-0.026		0.092	0.034	0.072
Family hardship experience	0.044	0.023	0.025	0.055	0.032

5) Casual preference (*i.e.*, preference for casual style)

Light religious experience has the strongest influence on the preference for casual style. Exchange experience has the second strongest influence. Exchange experience includes leisure and travel with friends and social exchange with a neutral relationship. This could be interpreted as meaning that neutral relationships make people casual. It is noteworthy that travel for leisure does not have a statistically significant effect on the preference for casual style. This means that the preference for casual styles formed through neutral rather than intense experiences.

4.3.2. Food Preferences (Table 2 and Figure 3)

1) Preference for gourmet food

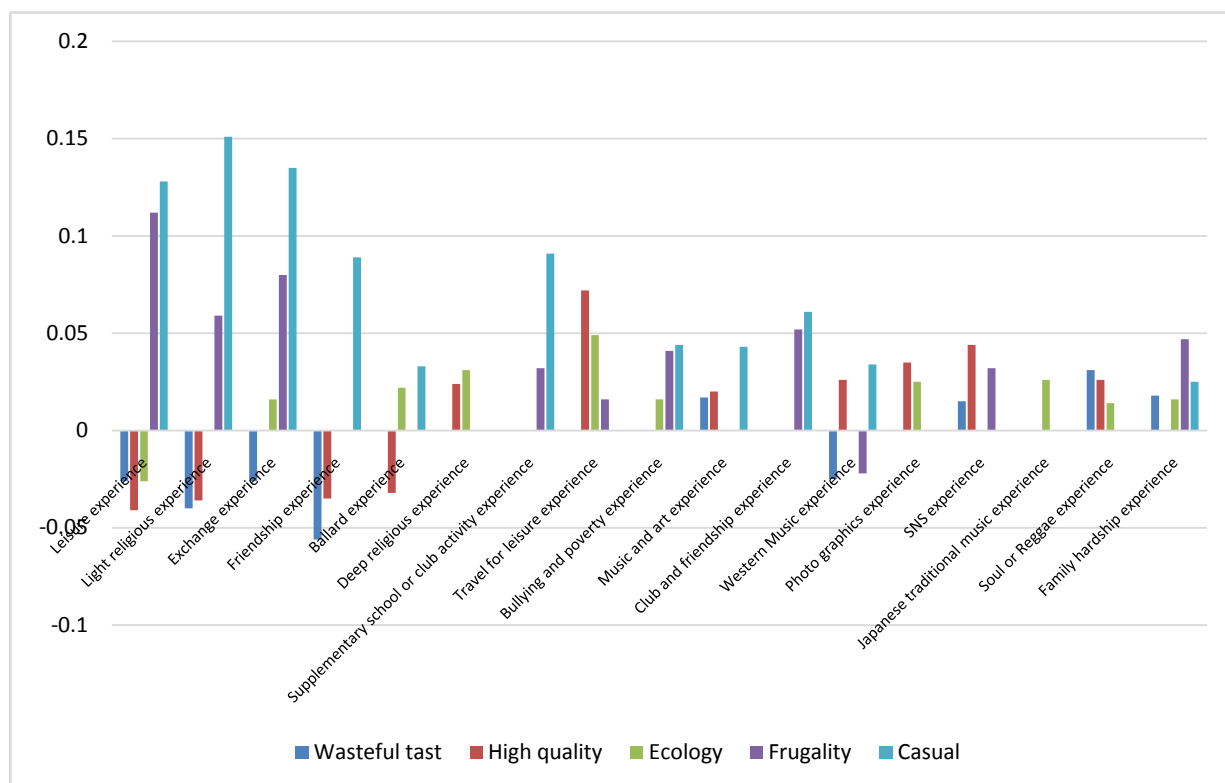


Figure 2. Standardized coefficients for statistically significant experiences (5% level): clothing (color in print).

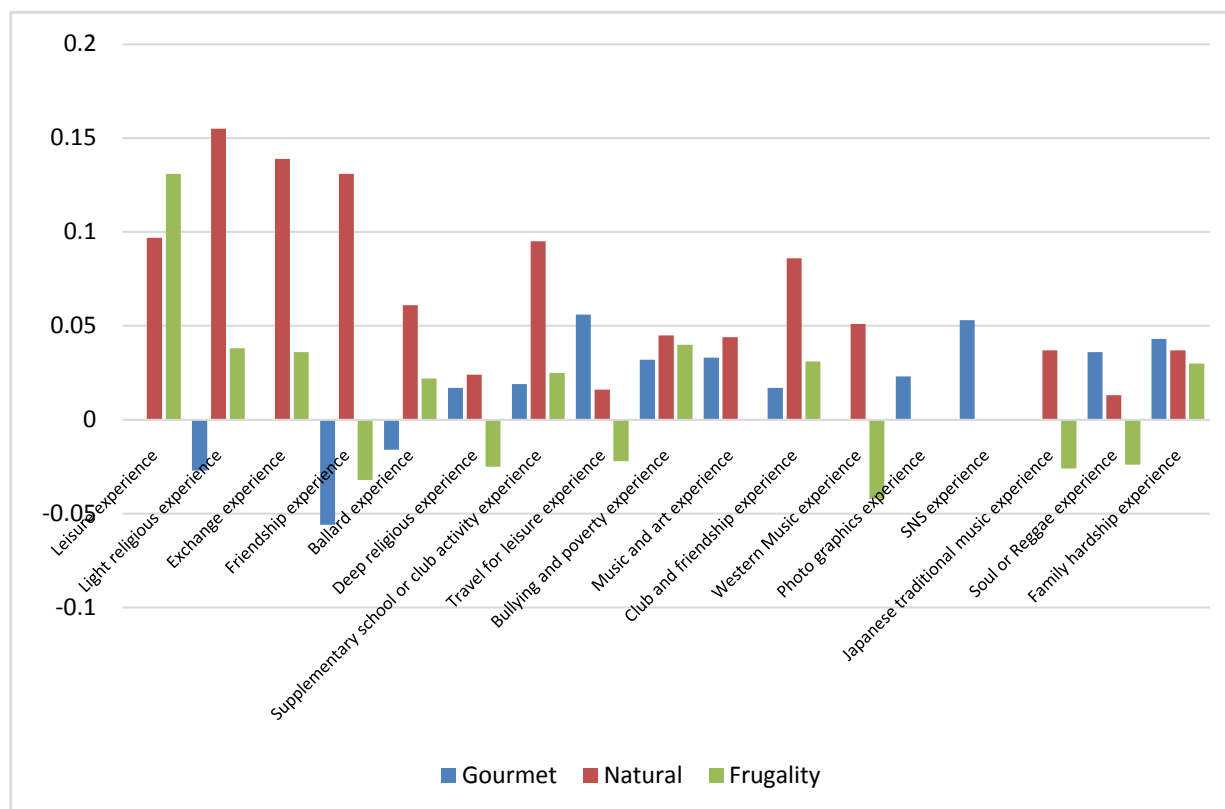


Figure 3. Standardized coefficients for statistically significant experiences (5% level): food (color in print).

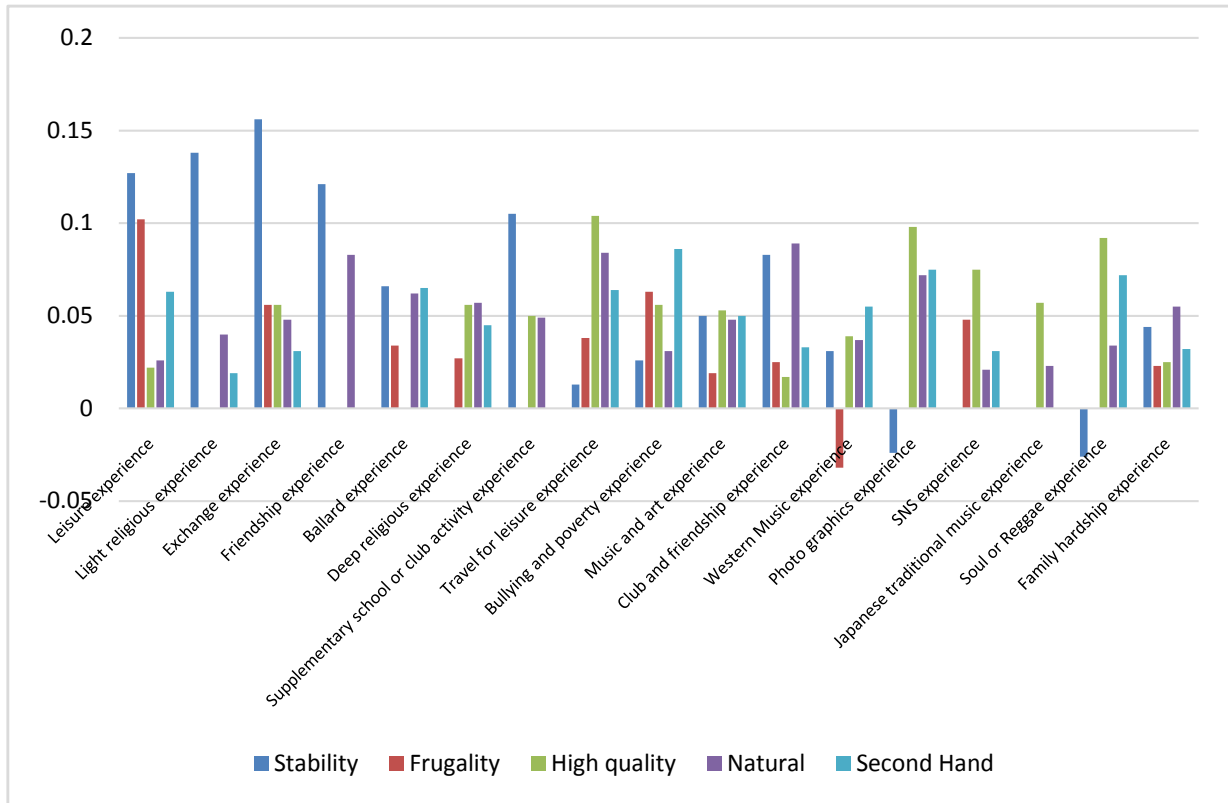


Figure 4. Standardized coefficients for statistically significant experiences (5% level): housing (color in print).

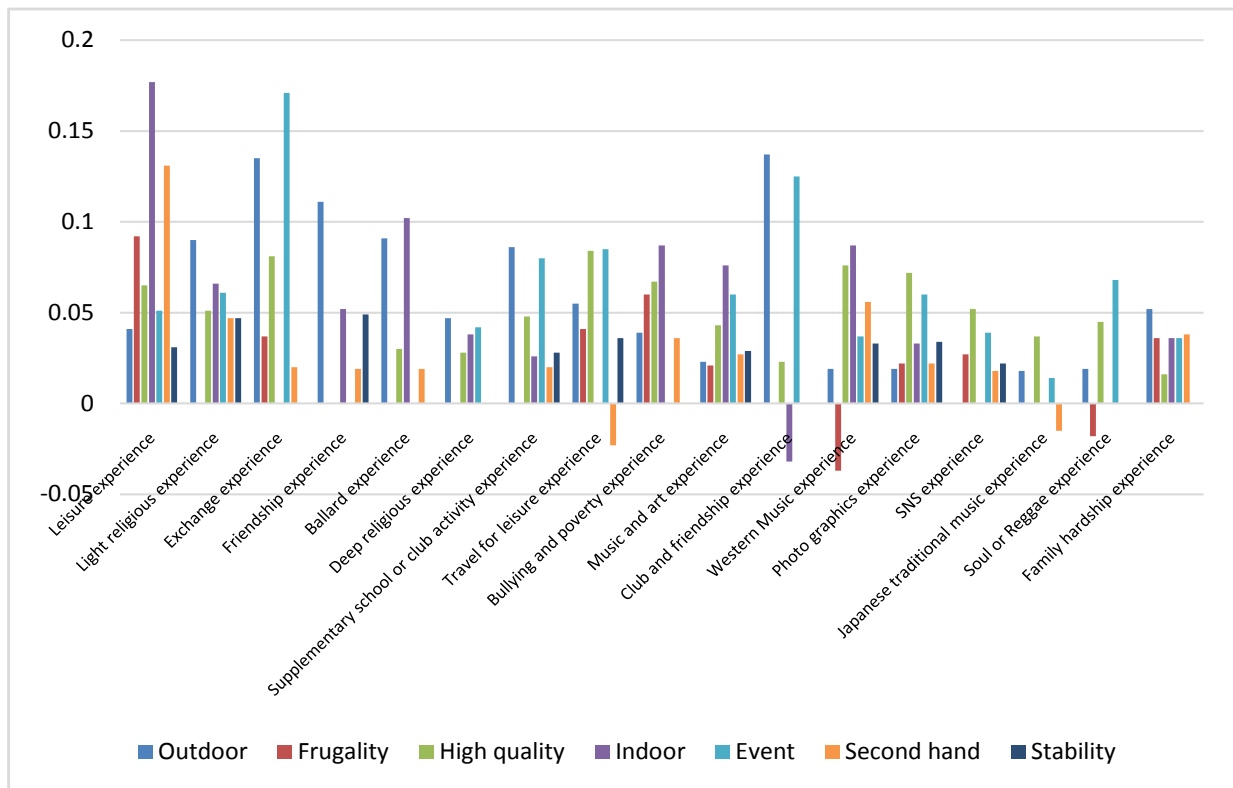


Figure 5. Standardized coefficients for statistically significant experiences (5% level): play (color in print).

Table 4. Standardized coefficients for statistically significant experiences (5% level): play.

	Out-door	Frugality	High quality	Indoor	Event	Second hand	Stability
Age	-0.673	0.156	0.257	-0.261	0.388	0.215	-0.355
Age squared	0.972	-0.157	0.309	0.294	0.392	-0.257	0.442
Monetary assets			0.034				0.022
Personal annual income		-0.026				-0.032	
Household annual income	-0.024	-0.074	0.083	-0.091	0.055	-0.043	0.045
Male dummy	-0.022	0.046	0.068	0.034		0.081	0.075
High educational attainment	-0.023			-0.021		-0.032	-0.02
Leisure experience	0.041	0.092	0.065	0.177	0.051	0.131	0.031
Light religious experience	0.09		0.051	0.066	0.061	0.047	0.047
Exchange experience	0.135	0.037	0.081		0.171	0.02	
Friendship experience	0.111			0.052		0.019	0.049
Ballard experience	0.091		0.03	0.102		0.019	
Deep religious experience	0.047		0.028	0.038	0.042		
Supplementary school or club activity experience	0.086		0.048	0.026	0.08	0.02	0.028
Travel for leisure experience	0.055	0.041	0.084		0.085	-0.023	0.036
Bullying and poverty experience	0.039	0.06	0.067	0.087		0.036	
Music and art experience	0.023	0.021	0.043	0.076	0.06	0.027	0.029
Club and friendship experience	0.137		0.023	-0.032	0.125		
Western music experience	0.019	-0.037	0.076	0.087	0.037	0.056	0.033
Photography experience	0.019	0.022	0.072	0.033	0.06	0.022	0.034
SNS experience		0.027	0.052		0.039	0.018	0.022
Traditional Japanese music experience	0.018		0.037		0.014	-0.015	
Soul or Reggae experience	0.019	-0.018	0.045		0.068		
Family hardship experience	0.052	0.036	0.016	0.036	0.036	0.038	

The strongest positive influence is travel for leisure experience, and the second is SNS experience. This implies that people form gourmet preferences as the result of excellent food experiences during traveling. SNSs stimulate conspicuous consumption by presenting photos of delicious food to the public.

2) Natural preference (*i.e.*, preference for natural ingredients)

The most interesting point here is the lack of a specific experience influencing the formation of a preference for naturalness. Almost all the experiences except

for photography experience and SNS experience have a positive influence on the formation of a preference for naturalness, and there is no negative experience. Among the experiences, light religious experience has the strongest influence. This can be interpreted as meaning that religion teaches us the importance of nature, which is deemed as a gift from the gods.

3) Preference for frugality

Leisure experience (including play within the house) has the strongest influence on the preference for frugality in this context. Those who enjoy staying home have fewer opportunities to eat excellent food and have less desire to enjoy good meals. On the other hand, those who seek to enjoy good meals through travel do not have a preference for frugality. Deep religious experience, music experience, and traditional Japanese music experience have a negative influence on the preference for frugality. These results imply that a preference for frugality is formed when one has fewer opportunities to eat in socially formal situations.

4.3.3. Housing Preferences (Table 3 and Figure 4)

1) Preference for firmness and stability

Concerning preference for firmness and stability, we try to interpret the results using a different approach. In this category, we examine the experiences that have the strongest influence on preference formation. Leisure experience (including play within the house), light religious experience, exchange experience, friendship experience, Ballard music experience, and supplementary school or club activity experience have the strongest influences on preference for stability. One interpretation for this result is that the preference for stability is formed through weak social interaction, and a moderate stance toward community members.

2) Preference for frugality

Bullying and poverty experience have the strongest influences on the formation of a preference for frugality in this context. One interpretation for this result is that the preference for frugality is not formed as the result of former experience, but arises from the economic situation.

3) Preference for high quality

Travel for leisure has the strongest influence on the formation of a preference for high quality housing. Travel provides a good opportunity for viewing excellent houses around the world. The good impression produced by well-designed, high-quality houses remains for a long time and forms the desire to build such a house. The high value of the standardized coefficient for photography experience can be interpreted in a similar way.

4) Preference for natural materials

Friendship experience, travel for leisure experience, club and friendship experience, and photography experience all have a relatively strong influence on the formation of a preference for natural surroundings. These experiences promote sensitivity to nature.

5) Preference for used housing

This preference is similar to the preference for frugality. Bullying and poverty experience have the strongest influence. One interpretation for this result is that this preference is also formed from the economic situation rather than from former experience.

4.3.4. Preferences for Leisure Activities (Table 4 and Figure 5)

1) Preference for outdoor activities

Exchange experience, club and friendship experience, and friendship experience have a relatively strong influence on the formation of a preference for natural activities. One interpretation for this result is that enjoying nature through social activities such as hiking and camping promotes sensitivity to nature.

2) Preference for frugality

Leisure experience (including play within the house) has the strongest influence on the formation of a preference for frugality in leisure activities. Those who know how to enjoy themselves within house have less incentive to spend a lot of money on leisure activities.

3) Preference for high quality

Travel for leisure has the strongest influence on the formation of a preference for high quality leisure activities. Through travel, one gets to know various types of leisure activity. By experiencing large variety of activities, it becomes possible to select the high quality ones. Exchange experience can be interpreted in a similar way. Sophisticated leisure experiences, including music and photo experiences, promote the formation of a preference for high-quality leisure activities.

4) Preference for indoor activities

Leisure experience (including play within the house) has the strongest influence on the formation of a preference for indoor activities. Those who know how to enjoy themselves within the house have less incentive to go outside.

5) Preference for attending events

Exchange experience has the strongest influence, and club and friendship experience has the second strongest influence on the formation of a preference for attending events. Travel for leisure also has a relatively strong influence. These results are interpreted as meaning that good and enjoyable experiences at various types of events are experienced through social activity or travel.

6) Preference for second hand play tools or media

Leisure experience (including play within the house) has the strongest influence on the formation of this preference. Those who know how to enjoy themselves within the house have less incentive to spend a lot of money on leisure activities. For them second hand play is good enough.

7) Preference for firmness and stability

Friendship experience has a relatively strong influence on the preference for stability. Compared to other preferences, the influence of experience is weaker.

This means the preference for firmness and stability is not formed through experience, but through social consciousness.

4.4. Correlation of Preferences among Items

In **Tables 5-7**, the coefficients for the correlations of various preferences are listed. The strength of correlation differs among items, but the pattern is similar for all preferences. For example, “clothing and food” and “housing and play” have strong correlations, whereas “clothing and play” and “clothing and housing” have relatively small correlations.

5. Discussion and Conclusion

In this paper, we focused on unconscious thought processes that are formed through experiences in life. Intuitively, we can expect that emotionally strong

Table 5. Correlation coefficients for a preference for a high grade experience among items.

	Clothing: High grade preference	Food: Gourmet preference	Housing: High grade preference	Play: High grade preference
Clothing: High grade preference	1	0.539**	0.111**	0.095**
Food: Gourmet preference	0.539**	1	0.113**	0.115**
Housing: High grade preference	0.111**	0.113**	1	0.480**
Play: High grade preference	0.095**	0.115**	0.480**	1

Table 6. Correlation coefficients for a preference for frugality among items.

	Clothing: Frugality preference	Food: Frugality preference	Housing: Frugality preference	Play: Frugality preference
Clothing: Frugality preference	1	0.484**	0.226**	0.202**
Food: Frugality preference	0.484**	1	0.233**	0.217**
Housing: Frugality preference	0.226**	0.233**	1	0.460**
Play: Frugality preference	0.202**	0.217**	0.460**	1

Table 7. Correlation coefficients for an ecological preference among items.

	Clothing: Ecology preference	Food: Natural preference	Housing: Natural preference	Play: Natural preference
Clothing: Ecology preference	1	0.355**	0.219**	0.187**
Food: Natural preference	0.355**	1	0.232**	0.373**
Housing: Natural preference	0.219**	0.232**	1	0.501**
Play: Natural preference	0.187**	0.373**	0.501**	1

experiences have a strong influence on the formation of unconscious patterns of thought, and preferences are formed through the accumulation of experiences. The results of the empirical analysis are consistent with this intuition and give us various insights into the mechanism of preference formation. Firstly, it is important to note that around 60% to 80% of experiences are statistically significant in explaining the formation of preference, and the number of significant variables increases when the preference is influenced by intense experiences, as is the case for the preference high quality or ecological options. This supports the intuitive idea that emotionally strong experiences have a strong influence on the formation of unconscious biases.

Secondly, the correlation coefficients of preference among items suggest that preference depends on the items, but the pattern of difference is similar among preferences. This suggests that the possible differences in the strength of the relation between experience and unconscious thought are different among items. Alternatively, it might be possible that there are differences in the strength of the relation between unconscious thoughts and preferences among items.

This study gives us various kinds of insights into the marketing strategies. Especially, the analysis on the formation of preference by experiences in life helps to provide advertisement information with strong appeal to each consumer. For example, it might be possible for an apparel company to design an effective promotion film or picture for consumers with specific preference such as ecology by imaging beautiful scenery with ballad music. This example is a part of strategy for changing consumers' behavior. The main force for changing consumers' behavior would be emotional impact. This study could be developed further for designing this emotional impact.

Acknowledgements

Funding: This work was supported by a grant of Strategic Research Foundation Grand-aided Project for Private Universities from Ministry of Education, Culture, Sport, Science and Technology, Japan (MEXT), 2013-2018 (S1391010).

References

- [1] Tirunillai, S. and Tellis, G.J. (2014) Mining Marketing Meaning from Online Chatter: Strategic Brand Analysis of Big Data using Latent Dirichlet Allocation. *Journal of Marketing Research*, **51**, 463-479. <https://doi.org/10.1509/jmr.12.0106>
- [2] Samuelson, P. (1938) A Note on the Pure Theory of Consumers' Behaviour. *Economica*, **5**, 61-71. <https://doi.org/10.2307/2548836>
- [3] Pollak, R.A. and Wales, T.J. (1969) Estimation of the Linear Expenditure System. *Econometrica: Journal of the Econometric Society*, **37**, 611-628. <https://doi.org/10.2307/1910438>
- [4] Deaton, A. and Muellbauer, J. (1980) An Almost Ideal Demand System. *The American Economic Review*, **70**, 312-326.
- [5] Carpenter, G.S. and Kent, N. (1989) Consumer Preference Formation and Pioneering Advantage. *Journal of Marketing Research*, **26**, 285-298.

- <https://doi.org/10.2307/3172901>
- [6] Govers, P.C.M. and Schoormans, J.P.L. (2005) Product Personality and Its Influence on Consumer Preference. *Journal of Consumer Marketing*, **22**, 189-197.
<https://doi.org/10.1108/07363760510605308>
- [7] Xie, Y., Rajeev, B. and Peng, S. (2015) An Extended Model of Preference Formation between Global and Local Brands: The Roles of Identity Expressiveness, Trust, and Affect. *Journal of International Marketing*, **23**, 50-71.
<https://doi.org/10.1509/jim.14.0009>
- [8] Jiménez, F.R. and Voss, K.E. (2014) An Alternative Approach to the Measurement of Emotional Attachment. *Psychology & Marketing*, **31**, 360-370.
<https://doi.org/10.1002/mar.20700>
- [9] Deshwal, P. (2015) Emotional Marketing: Sharing the Heart of Consumers. *International Journal of Advanced Research in Management and Social Sciences*, **4**, 254-265.
- [10] Majeed, S., Lu, C. and Usman, M. (2017) Want to Make Me Emotional? The Influence of Emotional Advertisements on Women's Consumption Behavior. *Frontiers of Business Research in China*, **11**, 16. <https://doi.org/10.1186/s11782-017-0016-4>
- [11] Winkielman, P. and Berridge, K.C. (2004) Unconscious Emotion. *Current Directions in Psychological Science*, **13**, 120-123.
<https://doi.org/10.1111/j.0963-7214.2004.00288.x>
- [12] Winkielman, P., Berridge, K.C. and Wilbarger, J.L. (2005) Unconscious Affective Reactions to Masked Happy versus Angry Faces Influence Consumption Behavior and Judgments of Value. *Personality and Social Psychology Bulletin*, **31**, 121-135.
<https://doi.org/10.1177/0146167204271309>
- [13] Dijksterhuis, A. and Nordgren, L.F. (2006) A Theory of Unconscious Thought. *Perspectives on Psychological Science*, **1**, 95-109.
<https://doi.org/10.1111/j.1745-6916.2006.00007.x>

Appendices

Appendix 1. Principal component analysis of experiences during elementary school days.

	Leisure through social interaction	Indoor leisure	Leisure through community relation	Supplementary learning	Club activity	SNS
Shopping	0.649	0.075	0.224	0.128	0.002	0.112
Leisure in game center or bowling	0.614	0.196	-0.114	0.072	0.25	0.032
Leisure in sport spectating or concert	0.607	0.101	0.116	0.16	0.056	0.145
Outdoor leisure such as cycling or travel	0.595	0.054	0.135	0.066	0.265	0.069
Dining out and chattering with friends	0.477	0.199	0.181	0.179	0.161	-0.036
Enjoying music	0.421	0.379	0.2	0.234	-0.12	0.111
Reading manga or magazine	0.054	0.657	0.319	0.112	0.133	0.006
Playing game	0.106	0.64	-0.291	0.082	0.223	0.117
Watching TV or DVD	0.243	0.569	0.111	0.148	0.094	0.065
Drawing manga or illustration	0.054	0.562	0.19	0.099	-0.017	0.044
Playing card game	0.231	0.35	0.197	-0.081	0.308	0.022
Having a good time with family	0.19	-0.019	0.61	0.043	0.21	0.024
Reading books	0.061	0.298	0.6	0.233	-0.004	0.081
Reading books	0.063	0.129	0.566	0.365	0.159	0.028
Indoor game such as Chess	0.178	0.349	0.445	-0.023	0.353	-0.065
Enjoying community event such as festival	0.202	0.046	0.326	0.171	0.543	-0.015
Outdoor playing	0.025	0.129	0.271	0.028	0.561	-0.074
Supplementary study at cram school	0.085	0.056	-0.015	0.796	0.054	0.012
Taking lesson class	0.099	0.062	0.178	0.714	0.148	-0.018
Boys or girls scout	0.022	-0.048	-0.191	0.231	0.647	0.124
Mail, SNS, Internet surfing	0.081	0.022	0.036	-0.003	-0.031	0.8
Smartphone game	0.021	0.046	-0.004	-0.006	0.043	0.809

Note: Rotation method is the Equamax Method.

Appendix 2. Factor analysis of clothing preferences.

	Waste preference	High grade preference	Ecology preference	Frugality preference	Casual preference
Clothing gorgeous	0.676	0.489	0.147	0.141	-0.054
Clothing hand made	0.66	0.296	0.364	0.225	-0.013
Clothing new item	0.622	0.389	0.243	0.2	0.054
Clothing imported	0.616	0.476	0.204	0.176	0.02
Clothing waste	0.584	0.42	0.153	0.166	0.04
Clothing advised	0.578	0.264	0.228	0.153	0.131
Clothing old fashioned	0.557	0.229	0.392	0.209	0.073
Clothing used	0.504	0.25	0.309	0.327	-0.029
Clothing urban	0.5	0.431	0.113	0.066	0.164
Clothing formal	0.487	0.442	0.199	0.074	0.05
Clothing bulk purchase	0.486	0.217	0.302	0.323	0.051
Clothing high grade	0.413	0.692	0.111	0.037	0.017
Clothing brand oriented	0.339	0.681	0.142	0.093	0.035
Clothing specialty shop	0.355	0.555	0.182	0.109	0.142
Clothing challenging	0.215	0.506	0.326	0.302	-0.006
Clothing independently	0.136	0.399	0.364	0.312	0.096
Clothing quality	0.029	0.384	0.127	-0.098	0.229
Clothing ecological	0.201	0.162	0.699	0.273	0.102
Clothing healthy	0.099	0.164	0.659	0.222	0.209
Clothing natural	0.089	0.067	0.628	0.167	0.234
Clothing domestic	0.149	0.136	0.363	0.151	0.377
Clothing shopping at local shop	0.332	0.005	0.298	0.253	0.31
Clothing discount	0.012	0.031	0.118	0.666	0.194
Clothing reasonable price	0.02	-0.18	0.05	0.569	0.281
Clothing point system	0.121	0.233	0.262	0.544	0.091
Clothing mail order	0.214	0.233	0.28	0.369	0.096
Clothing frugality	0.194	-0.12	0.229	0.353	0.346
Clothing not used	-0.142	0.048	-0.084	0.06	0.617
Clothing simple	-0.026	-0.121	0.191	0.203	0.567
Clothing real shop	0.066	0.117	0.044	0.123	0.527
Clothing casual	-0.053	-0.047	0.164	0.255	0.439
Clothing not bulk shopping	0.241	0.135	0.17	0.112	0.421
Clothing stability	0.019	0.156	0.152	0.047	0.315

Note: Rotation method is the Equamax Method.

Appendix 3. Factor analysis of food preferences.

	Gourmet preference	Natural preference	Frugality preference	Meat preference
Food gorgeous	0.84	-0.036	-0.109	0.054
Food imported	0.794	0.054	-0.038	0.003
Food brand oriented	0.775	-0.009	-0.132	0.017
Food urban	0.755	0.065	-0.074	0.036
Food waste	0.751	0.026	-0.034	0.076
Food high grade	0.743	-0.021	-0.202	0.053
Food sociable	0.736	0.068	-0.081	0
Food eating out	0.726	-0.051	-0.012	0.142
Food challenging	0.632	0.102	-0.011	-0.034
Food mail order	0.622	0.187	0.102	-0.062
Food specialty shop	0.62	0.137	-0.136	0.049
Food ready-made meal	0.609	0.136	0.164	0.031
Food junk food	0.604	0.079	0.234	0.083
Food independently	0.593	0.196	0.062	-0.14
Food convenience store	0.545	0.123	0.21	0.051
Food ecological	0.544	0.324	0.113	-0.256
Food single	0.529	0.229	0.215	-0.125
Food not bulk purchase	0.486	0.276	0.088	-0.095
Food bulk purchase	0.446	0.303	0.206	0.012
Food vegetarian	0.024	0.655	0.019	0.123
Food domestic	0.085	0.643	-0.045	0.014
Food local purchase	0.163	0.589	0.141	-0.047
Food fish	0.078	0.589	-0.001	0.293
Food local production and purchase	0.251	0.583	-0.077	-0.125
Food health	0.206	0.554	-0.025	-0.155
Food hand made	0.198	0.548	0.028	-0.004
Food real shop	0.032	0.521	0.144	0.176
Food with family	0.178	0.489	0.041	0.048
Food simple	0.208	0.475	0.23	-0.164
Food stability	0.111	0.443	0.067	-0.057
Food quality	0.076	0.405	-0.247	0.006
Food reasonable price	0.109	0.238	0.593	0.067
Food discount	0.167	0.304	0.552	0.044
Food frugality	0.203	0.408	0.403	-0.117
Food point system	0.352	0.276	0.381	-0.021
Food meat	0.108	0.41	0.103	0.44

Note: Rotation method is the Quartimax Method.

Appendix 4. Factor analysis of housing preferences.

	Steady preference	Frugality preference	High grade preference	Natural preference	Used preference
Housing not used	0.564	0.151	0.158	0.05	0
Housing stability	0.467	0.071	0.007	0.118	0.009
Housing domestic	0.44	0.138	0.123	0.225	0.064
Housing quality	0.422	-0.002	0.217	0.135	-0.114
Housing simple	0.326	0.099	-0.058	0.182	0.192
Housing local purchase	0.302	0.183	-0.004	0.228	0.175
Housing discount	0.111	0.752	0.043	0.038	0.073
Housing point system	0.07	0.59	0.118	0.084	0.016
Housing reasonable price	0.032	0.453	-0.156	0.009	0.268
Housing high grade	0.156	-0.031	0.532	0.073	0.017
Housing brand oriented	0.134	0.047	0.459	0	0.001
Housing gorgeous	-0.033	0.01	0.384	0.068	0.117
Housing imported	0.023	0.005	0.334	0.063	0.19
Housing new item	0.179	0.105	0.281	0.08	0.074
Housing urban	0.16	0.055	0.27	0.048	0.133
Housing challenging	-0.074	0.032	0.269	0.134	0.186
Housing natural	0.168	0.028	-0.015	0.603	0.089
Housing ecology	0.168	0.201	0.019	0.478	0
Housing hand made	0.043	0.023	0.103	0.376	0.167
Housing old fashioned	0.097	0.009	0.106	0.348	0.235
Housing independently	0.06	0.04	0.21	0.225	0.223
Housing used	0.068	0.107	0.007	0.069	0.309
Housing rental	-0.076	0.034	0.075	0.036	0.16

Note: Rotation method is the Equamax Method

Appendix 5. Factor analysis of play preferences.

	Natural preference	Frugality preference	High grade preference	Indoor preference	Event preference	Used preference	Steady preference
Play natural	0.545	-0.015	-0.016	0.029	0.085	-0.033	-0.006
Play healthy	0.525	0.064	0.004	-0.001	0.121	-0.074	0.045
Play local purchase	0.467	0.113	0.096	0.14	-0.002	0.044	0.042
Play domestic	0.44	0.062	0.228	0.136	-0.006	0.06	0.135
Play morning	0.381	0.044	0.052	-0.052	0.002	0.04	-0.014
Play with family	0.372	0.044	0.009	-0.072	0.144	-0.013	0.001
Play frugality	0.34	0.265	-0.065	0.168	-0.119	0.064	-0.003
Play not used	0.291	0.087	0.294	0.144	0.089	0.18	0.244
Play outdoor	0.285	0.016	0.055	-0.133	0.312	-0.002	-0.002
Play old fashioned	0.264	-0.005	0.122	0.158	0.002	0.107	0.011
Play self-improvement	0.261	-0.017	0.125	0.182	0.083	0.017	0.02
Play discounted	0.144	0.791	0.092	0.054	0.046	0.042	0.06
Play point system	0.144	0.54	0.099	0.076	0.077	0.074	0.042
Play reasonable price	0.222	0.47	-0.071	0.135	-0.039	0.091	-0.006
Play brand oriented	0.072	0.031	0.527	-0.023	0.04	-0.025	0.039
Play high grade	0.074	-0.014	0.497	-0.003	0.055	-0.045	0.061
Play imported	0.102	-0.004	0.391	0.078	0.052	0.116	-0.019
Play urban	0.174	0.021	0.304	0.119	0.123	0.002	0.005
Play new item	0.12	0.055	0.281	0.134	0.173	0.072	0.075
Play quality	0.201	0.021	0.264	0.023	0.006	0.02	0.528
Play waste	-0.005	0.026	0.232	0.144	0.24	0.062	0.008
Play single	0.152	0.076	0.093	0.456	-0.045	0.062	0.01
Play night	0.064	0.083	0.112	0.41	0.2	0.049	0.065
Play indoor	0.067	0.07	0.029	0.349	-0.036	0.076	-0.016
Play independently	0.182	0.002	0.128	0.255	0.155	0.087	0.044
Play event	0.126	0.033	0.08	0.003	0.417	0.013	-0.047
Play challenging	0.088	-0.015	0.126	0.085	0.377	0.032	-0.01
Play societal	0.2	-0.01	0.125	0.005	0.355	-0.007	0.017
Play used	0.069	0.119	0.097	0.149	0.019	0.61	0.023
Play rental	0.087	0.072	0.057	0.129	0.051	0.322	-0.006
Play stability	0.313	0.121	0.09	0.072	-0.075	-0.02	0.395

Note: Rotation method is the Quartimax Method.

Appendix 6. (a)-(c) Principal component analysis of experiences.

(a)

	Leisure experience	Light religious experience	Exchange experience	Friendship experience	Ballard experience	Deep religious experience
Indoor leisure after junior high school	0.837	0.095	-0.066	0.064	-0.045	-0.01
Indoor leisure during elementary school days	0.827	0.019	-0.053	0.071	-0.072	-0.013
Japanese pop after junior high school days	0.535	0.086	0.266	-0.172	0.01	0.019
Japanese pop during elementary school days	0.522	0.114	0.332	-0.177	0.037	0.015
Light religious experience during elementary school days	0.061	0.92	0.058	0.091	0.042	-0.002
Light religious experience after unior high school days	0.045	0.917	0.092	0.115	0.063	-0.005
Leisure through social interaction after junior high school days	-0.029	0.144	0.783	0.001	0.084	0.008
Leisure through social interaction during elementary school days	-0.063	0.018	0.572	-0.027	-0.079	0.013
Travel with friends during elementary school days	0.137	0.167	0.527	0.335	-0.024	0.052
Travel with friends after junior high school days	0.137	0.203	0.507	0.347	0.039	0.053
Self-improvement in community during elementary school days	0.02	0.14	0.073	0.805	0.108	0.027
Leisure with family after junior high school days	-0.009	0.088	-0.03	0.794	0.073	0.044
Ballard music during elementary school days	-0.037	0.031	-0.003	0.031	0.865	0.031
Ballard and classical after junior high school days	-0.041	0.059	0.023	0.099	0.861	0.057
Deep religious experience after junior high school days	-0.016	0.002	-0.002	0.032	0.041	0.885
Deep religious experience during elementary school days	-0.001	-0.011	0.015	0.017	0.042	0.882
Supplementary school during elementary school days	0.031	0.061	0.02	0.065	0.051	0.032
Supplementary school after junior high school days	-0.043	0.081	-0.027	-0.102	-0.025	0.047
Travel for leisure during elementary school days	0.058	0.001	-0.064	0.025	-0.003	0.049
Travel for leisure after junior high school	0.073	0.047	0.199	0.075	-0.002	0.051
Bullying, violence, and poverty after junior high school days	0.053	-0.002	-0.026	0.004	-0.002	0.026
Private distress during elementary school days	0.048	0.007	-0.009	0.007	-0.002	0.035
Music and art after junior high school days	-0.008	0.052	-0.018	0.084	0.079	0.049
Music and art during elementary school days	0.047	0.094	0.111	0.189	0.034	0.079
Club activity during elementary school days	0.017	0.134	0.143	-0.173	0.036	0.062
Friendly connection after junior high school days	0.019	-0.002	-0.066	0.106	0.117	0.057
Western and classical music during elementary school days	-0.011	0.001	0.024	-0.033	0.015	0.027
Western music after junior high school days	0.18	0.125	0.175	-0.017	-0.006	0.016
Photography during elementary school days	-0.015	0.013	-0.007	-0.01	0.018	0.071
Visual art photo graphic after junior high school days	0.138	0.101	0.126	0.157	0.177	0.105
Stage performance after junior high school days	-0.026	-0.027	-0.077	-0.035	-0.114	-0.02

Continued

SNS during elementary school days	-0.05	0.014	-0.128	0.015	0.012	0.021
SNS after junior high school days	0.068	-0.037	0.076	-0.01	-0.122	0.001
Japanese traditional culture during elementary school days	0.009	-0.006	-0.035	-0.007	0.026	0.032
Flower and tea ceremony after junior high school days	-0.04	0.082	0.135	0.213	0.09	0.08
Soul and reggae after junior high school days	0.054	0.024	0.128	-0.035	-0.014	0.017
Soul and reggae during elementary school days	0.007	-0.013	-0.051	-0.051	0.029	0.042
Hardship such as death of family members or failure in exam after junior high school days	0.015	0.074	0.021	0.028	0.036	0.037
Distress in family during elementary school days	-0.028	0.02	-0.015	0.012	0.047	0.04

(b)

	Supplementary school or club activity experience	Travel for leisure experience	Bullying and poverty experience	Music and art experience	Club and friendship experience	Western Music experience
Indoor leisure after junior high school	0.051	0.026	0.062	-0.009	0.057	0.154
Indoor leisure during elementary school days	-0.015	0.065	0.059	-0.021	0.032	0.135
Japanese pop after junior high school days	-0.004	0.104	0.096	0.173	0.017	-0.354
Japanese pop during elementary school days	-0.032	0.101	0.076	0.264	-0.018	-0.221
Light religious experience during elementary school days	0.075	0.034	0.011	0.078	0.068	0.056
Light religious experience after junior high school days	0.07	0.013	-0.002	0.063	0.078	0.049
Leisure through social interaction after junior high school days	-0.01	0.098	-0.035	0.027	0.037	0.134
Leisure through social interaction during elementary school days	-0.08	0.398	0.013	0.132	0.017	0.116
Travel with friends during elementary school days	0.3	-0.061	-0.048	0.058	0.357	0.054
Travel with friends after junior high school days	0.265	-0.224	-0.052	0.045	0.368	0.054
Self improvement in community during elementary school days	-0.109	0.05	-0.002	0.109	0.084	-0.026
Leisure with family after junior high school days	0.078	0.076	0.022	0.172	-0.146	-0.011
Ballard during elementary school days	0	-0.024	0.011	0.054	0.044	0.012
Ballard and classical after junior high school days	0.021	0.008	-0.016	0.044	0.07	-0.007
Deep religious experience after junior high school days	0.044	0.049	0.029	0.048	0.032	0.017
Deep religious experience during elementary school days	0.018	0.034	0.032	0.053	0.062	0.017
Supplementary school during elementary school days	0.801	0.075	0.029	0.103	-0.177	0.053
Supplementary school after junior high school days	0.787	0.067	0.01	0.125	0.228	-0.035
Travel for leisure during elementary school days	0.053	0.805	0.026	0.017	0.066	0.031
Travel for leisure after junior high school	0.093	0.777	0.021	0.021	0.07	0.033

Continued

Bullying, violence, and poverty after junior high school days	-0.009	0.021	0.887	0.031	0.008	0.007
Private distress during elementary school days	0.038	0.015	0.863	0.043	-0.021	0.025
Music and art after junior high school days	0.072	0.039	0.036	0.823	0.013	0.129
Music and art during elementary school days	0.174	0.008	0.056	0.743	0.015	0.124
Club activity during elementary school days	0.183	-0.014	-0.002	0.022	0.758	-0.006
Friendly connection after junior high school days	-0.202	0.223	-0.007	-0.002	0.721	0.005
Western and classical music during elementary school days	0.016	0.097	0.022	0.119	-0.031	0.771
Western music after junior high school days	0.007	-0.013	0.023	0.13	0.045	0.73
Photo graphic during elementary school days	0.002	0.08	0.047	-0.039	0.018	0.052
Visual art photo graphic after junior high school days	0.114	0.002	0.061	-0.128	0.006	0.178
Stage performance after junior high school days	-0.038	0.014	0.026	0.245	0.115	-0.112
SNS during elementary school days	-0.012	0.024	0.016	-0.003	0.082	0.073
SNS after junior high school days	0.022	0.087	0.057	0.029	-0.056	-0.016
Japanese traditional culture during elementary school days	0.029	0.039	0.043	0	0.04	0.073
Flower and tea ceremony after junior high school days	0.115	-0.006	0.004	-0.119	-0.114	0.034
Soul and reggae after junior high school days	0.031	0.06	0.028	0.054	-0.003	0.029
Soul and reggae during elementary school days	-0.025	0.053	0.063	0.039	0.013	-0.125
Hardship such as death of family members or failure in exam after junior high school days	0.073	0.001	-0.065	0.02	0.014	0.015
Distress in family during elementary school days	-0.08	0.042	0.127	-0.001	0.042	-0.004

(c)

	Photo graphics experience	SNS experience	Japanese traditional music experience	Soul or Reggae experience	Family hardship experience
Indoor leisure after junior high school	0.022	-0.071	-0.075	0.054	-0.014
Indoor leisure during elementary school days	0.002	0.033	-0.033	0.112	-0.006
Japanese pop after junior high school days	0.116	0.266	0.099	-0.185	0.023
Japanese pop during elementary school days	0.106	0.174	0.127	-0.197	0.016
Light religious experience during elementary school days	0.036	-0.016	0.021	0.009	0.068
Light religious experience after junior high school days	0.024	-0.007	0.034	0.002	0.062
Leisure through social interaction after junior high school days	-0.032	-0.078	0.029	0.073	0.017
Leisure through social interaction during elementary school days	0.128	0.022	0.051	0.018	-0.015
Travel with friends during elementary school days	0.005	0.057	0.021	0.052	0.018

Continued

Travel with friends after junior high school days	0	0.024	0.022	0.043	0.029
Self improvement in community during elementary school days	0.022	-0.028	0.035	-0.046	0.046
Leisure with family after junior high school days	0.051	0.016	0.14	-0.055	0.02
Ballard during elementary school days	0.027	-0.076	0.044	-0.005	0.026
Ballard and classical after junior high school days	0.031	-0.034	0.03	0.016	0.071
Deep religious experience after junior high school days	0.053	0.016	0.025	0.019	0.041
Deep religious experience during elementary school days	0.052	0.004	0.059	0.035	0.044
Supplementary school during elementary school days	0.028	0.011	0.059	0.005	-0.01
Supplementary school after junior high school days	0.023	-0.001	0.063	0.006	0.01
Travel for leisure during elementary school days	0.078	0.091	0.018	0.055	0.025
Travel for leisure after junior high school	-0.005	0.043	0.021	0.073	0.037
Bullying, violence, and poverty after junior high school days	0.017	0.035	0.011	0.027	0.129
Private distress during elementary school days	0.061	0.039	0.035	0.055	-0.064
Music and art after junior high school days	-0.091	0.071	-0.049	0.054	0.016
Music and art during elementary school days	0.068	-0.042	-0.021	0.055	0.012
Club activity during elementary school days	-0.038	-0.011	-0.016	0.019	0.029
Friendly connection after junior high school days	0.131	0.035	-0.025	-0.013	0.055
Western and classical music during elementary school days	0.087	0.082	0.072	-0.002	0.017
Western music after junior high school days	0.019	-0.022	0.018	-0.101	0
Photo graphic during elementary school days	0.807	0.16	-0.058	0.088	0.016
Visual art photo graphic after junior high school days	0.588	0.06	-0.241	0.032	0.068
Stage performance after junior high school days	0.562	-0.096	0.429	0.14	0.033
SNS during elementary school days	0.086	0.789	0.056	0.116	0.022
SNS after junior high school days	0.049	0.75	0.028	0.078	-0.002
Japanese traditional culture during elementary school days	-0.001	0.089	0.8	0.115	0.031
Flower and tea ceremony after junior high school days	-0.119	0.022	0.63	-0.017	-0.014
Soul and reggae after junior high school days	0	0.034	0	0.817	0.012
Soul and reggae during elementary school days	0.169	0.175	0.137	0.687	0.039
Hardship such as death of family members or failure in exam after junior high school days	0.027	0.027	0.002	0.021	0.774
Distress in family during elementary school days	0.023	-0.011	0.018	0.02	0.804

Note: Rotation method is the Equamax Method.