

Resolving Service Quality Uncertainty through Word-of-Mouth Communication

Shigeru MATSUMOTO and Yang CAO



文部科学省私立大学社会連携研究推進拠点
関西大学政策グリッドコンピューティング実験センター

Policy Grid Computing Laboratory,
Kansai University
Suita, Osaka 564-8680 Japan
URL : <https://www.pglab.kansai-u.ac.jp/>
e-mail : pglab@jm.kansai-u.ac.jp
tel. 06-6368-1228
fax. 06-6330-3304

関西大学政策グリッドコンピューティング実験センターからのお願い

本ディスカッションペーパーシリーズを転載、引用、参照されたい場合には、ご面倒ですが、弊センター（pglab@jm.kansai-u.ac.jp）宛にご連絡いただきますようお願い申し上げます。

Attention from Policy Grid Computing Laboratory, Kansai University

Please reprint, cite or quote WITH consulting Kansai University Policy Grid Computing Laboratory (pglab@jm.kansai-u.ac.jp).

Resolving Service Quality Uncertainty through Word-of-Mouth Communication

Shigeru MATSUMOTO ^{1,2}

Yang CAO ²

Abstract

People use various information sources to resolve service quality uncertainty. This paper focuses on word-of-mouth communication among mothers. We conduct a survey of mothers with children in kindergarten to determine whether they use information from their friends on the choice of kindergartens and children's clinics. We identify the factors that influence mothers' word-of-mouth communication. We find that a younger and wealthy mother uses information from friends more frequently on the choice of children's clinics. We also examine whether the behavior of mothers is influenced by the communication skills of other mothers in the classroom. We do not find network externalities in mothers' word-of-mouth communication.

Key Words:

Network Externalities, Quality Uncertainty, Word-of-Mouth Communication

¹Department of Economics, Aoyama Gakuin University

²Policy Grid Computing Laboratory, Kansai University

Introduction

Suppose there are variations in the service quality of facilities. Then, people try to obtain relevant information before choosing a facility. If they are unable to find out the service quality of a facility without using it, they may consult their friends about it. Although various communication methods are available in modern society, word-of-mouth communication still plays an important role in our daily lives.

This paper analyzes word-of-mouth communication between mothers. Residing in the same neighborhood, they often have common concerns. To effectively obtain valuable local information, they exchange a variety of information on a daily basis.

We conducted a survey of mothers with children in kindergarten to determine whether they use information obtained from friends with regard to the choice of kindergartens and children's clinics. We focused our attention on the choice of these two facilities due to the following three reasons. First, selecting one of these facilities is an important issue for mothers. They must choose these facilities very carefully. Second, they try to obtain relevant information before choosing the facilities. However, it is difficult to evaluate the service quality of these two facilities beforehand. Therefore, they consult with another mother (a friend) since she may have exclusive information. Third, kindergartens and children's clinics are local facilities, and this makes the information obtained from friends more useful as compared to that obtained from other sources³.

Mothers obtain new information through word-of-mouth communication, using

³ We conducted our survey in Japan, where there is a minor variation in doctor's consultation fees and tuitions.

which they can successfully choose the facility. The objective of this paper is to identify the factors that influence communication between mothers; it initially examines whether socioeconomic variables influence their communication. It is revealed that none of the socioeconomic variables explain the difference in mothers' communication skills with regard to the choice of kindergarten. In contrast, their age and their spouse's income explain the difference in their communication on the choice of clinics. Therefore, socioeconomic variables partially explain mothers' communication skills.

In choosing between children's clinics, mothers can consider the evaluation of the mothers of her children's classmates. When a mother contacts a group (the kindergarten class) of mothers who actively socialize with their friends, she may begin to exchange information more frequently; this makes it likely that she will use information from friends in the choice of children's clinics. In this paper, we examine whether network externalities exist in word-of-mouth communication among mothers. Our result reveals that the classroom environment does not influence mothers' behavior. Thus, we eliminate network externalities.

The rest of the paper is organized as follows. In the following section, we discuss the foregoing works related to our study. In Section 3, we explain our survey methodology. Section 4 describes our dataset. We specify our empirical model in Section 5 and report the results in Section 6. Section 7 presents our conclusions.

1. Background

In recent years, several social scientists have examined whether an agent alters his or

her behavior through social interactions. They measured the effect of social interaction in various social problems, namely, teenage pregnancy and school dropout behavior (Evans, Oates, and Schwab 1992), crime (Glaser, Sacerdote, and Scheinkman 1996), unemployment (Topa 2001), and industrialization (Miguel, Gertler, and Levine 2005).

Since a desirable education policy changes with the presence of peer effects, the examination of peer effect in classrooms is important. The effect of social interaction on school education has been analyzed most extensively. Many papers examine whether the performance of students is influenced by that of their peers (Angrist and Lang 2004), (Hoxby 2000), (Sacerdote 2001), (Zimmerman 2003), (Winston and Zimmerman 2003), and (Arcidiacono and Nicholson 2005).

Another intensive research field is development economics. In developing countries, formal social organizations are often weak. Under certain circumstances, informal networks among local residents are substituted for the functions of formal social organization. It is important to understand how informal networks function in developing economics. Several literatures examine the functions of the informal networks among local residents. See for example, Narayan and Pritchett (1999) and Fafchamps and Minten (2001, 2002).

The foregoing studies analyze the effect of social interactions on socioeconomic outcomes. Some literatures examine the effect of student interaction on their performance, whereas others examine the effect of trade network of brokers on their sales. Although it is important to analyze the effect of social interaction on the outcome, many factors other than social interaction, which the study attempts to analyze,

influence the outcome. Unfortunately, it is often difficult to separate the effect of a specific social interaction from the effects of other factors.

This paper carefully considers the various stages of social interactions. In the first stage, an agent makes contact with another agent. In the second stage, the agent chooses a specific action. In the final stage, the outcome of the chosen action becomes clear. This paper studies the action in the second stage. In particular, we examine whether the agent alters her action through social interactions.

To precisely draw inferences from social interaction, we have to specify how social interaction works. Manski (2000) classified social interaction into three categories: constraint interactions, expectation interactions, and preference interactions.

When positive (negative) constraint interactions are present, decisions by one agent decreases (increases) the cost of the action of other agents. A familiar form of negative constraint interaction is congestion. People take into account the travel time when making their travel decisions. Travel time depends on the number of agents using the road. Thus, the driving decision of one agent is affected by the decision of other agents.

When agents do not have perfect information, they form expectations of the outcomes that follow from the actions. The agents can obtain new information by making contact with other agents, using which, they may alter their actions. In expectation interactions, social interactions change the formation of expectation and subsequently change the agent's action.

Preference interactions occur when the order of an agent's preference over the

choice sets is influenced by the actions chosen by other agents. In noncooperative game theory, it is often presumed that the payoff to the agent depends on the actions chosen by other agents. For example, in the prisoner's dilemma setting, the punishment of one prisoner depends on the confession by the other prisoner.

In this paper, we focus on expectation interaction. We assume that mothers do not have precise knowledge about the service quality of kindergartens and children's clinics. However, some mothers have some exclusive information about service quality. Thus, by communicating with each other, mothers can obtain new information.

2. Survey Methodology

2.1. Focus Group

This paper focuses on mothers who have children in kindergarten. In Japan, most of the children attend kindergarten from 9am to 3pm. Therefore, the mobility of the mothers is extremely restricted. Due to the restricted mobility, we expect that the value of word-of-mouth communication rises among them.

Mothers with small children take their children out in parks or other playgrounds. After their children befriend each other, their mothers make contacts as well, and exchange phone numbers and visit each other. It is common for a mother to create a circle of friends through the activities of their children. They reside in the same area and share a common concern about the development of their children. These circumstances encourage them to exchange information; some of the information obtained through word-of-mouth communication is valuable.

In this survey, we asked mothers whether they use the information obtained from their friends on the choice of kindergartens and children's clinics. Every mother wants her child to be educated in a good environment and also to be examined by a good medical doctor. Thus, the choice of these two facilities is particularly important. Nonetheless, it is difficult to determine the service quality of these facilities beforehand. Therefore, we expect that mothers consult with their friends before choosing a facility.

2.2. Survey Methodology

The survey was conducted in Suita City from June 16, 2006 to July 10, 2006. Suita City is a commuters' town of Osaka City, the second largest city in Japan. In 2005, the population of Suita City stood at approximately 350,000.

We conducted the survey in cooperation with private kindergartens located in Suita City. We attended the annual meeting of Suita Private Kindergarten Association held on June 26, 2006 and requested the directors of all the kindergartens to provide assistance in our survey.⁴ Later, we contacted each kindergarten by phone and again requested their assistance. Subsequently, seven kindergartens agreed to cooperate.⁵

A preliminary survey was conducted at one kindergarten, and the main survey was conducted at the remaining six kindergartens; we refer to these as Kindergartens 1, 2, 3, 4, 5, and 6. In the following analysis, we use the results obtained from the main survey. We asked the kindergartens to distribute questionnaires to the children attending and to collect the questionnaires within 10 business days. In the six kindergartens, 2,237

⁴ All the private kindergartens located in Suita are members of this association.

⁵ There are 17 private kindergartens in Suita.

questionnaires were distributed, of which 1,541 were collected. Therefore, the collection rate of the survey is approximately 68.9%.⁶ After eliminating the inappropriate questionnaires, we obtained 1,492 samples.

3. Data

3.1. Information Source

In the survey, we asked mothers on what basis they chose the kindergarten and children's clinic. We provided a multiple-response questionnaire and asked mothers to indicate all methods that they used in choosing these two facilities. Table 1 summarizes the results.

The table shows that very few mothers use information obtained from sources such as informative magazines and the Internet; in contrast, many mothers use information from their acquaintances (friends, relatives, etc).

3.2. Statistical Summary

When a mother answered that she used information from her acquaintances, we asked her to specify the person who introduced the facility to her. By examining the written answers carefully, we identified the mothers who used information from their friends.⁷

The first two rows in Table 2 list the ratio of the mothers who used information

⁶ We distributed one questionnaire to each kindergartner but collected one questionnaire from each household. When brothers and sisters attended the same kindergarten, questionnaires of all but one child were discarded. Therefore, the actual collection rate should be slightly higher than 68.9%.

⁷ We eliminated from consideration those mothers who obtained information only from their relatives or specialists (another medical doctor).

from friends. It also shows that the ratio varies among kindergartens and between the two facility choices. On the choice of kindergarten, the mothers with children in kindergarten 1 use information from friends most frequently. In contrast, on the choice of a children's clinic, the mothers with children in kindergarten 6 use information from friends most frequently.

4. Empirical Model

4.1. Socio-demographic Variables of Agents

We initially examined whether socioeconomic variables, typically used in econometric analyses, can explain the difference in communication between mothers. We considered four socioeconomic variables in the analysis including the mother's age, educational background, and job. We also include her spouse's income, which largely influences household income, since only a few mothers hold fulltime jobs. At the bottom of Table 2, we report the summary statistics of these four variables.

4.2. Value of Information obtained from friends

If a child has a brother or a sister, then the child will use the facility that the brother or sister used. Thus, the mother is less likely to consult her friends in choosing the kindergarten. To control for the effect of the presence of brothers and sisters on the use of information from friends, we create a dummy variable, the brother-sister use variable. This variable becomes 1 when a mother answered that she chose the facility because her elder child had used it before.

If a mother herself has used the same facility in her childhood, she is bound to know its service quality. Moreover, if her relatives have used the facility, she can inquire about its service quality from them. In both situations, the mother is less likely to consult her friends. To control for these effects, we create another dummy variable, the relative use variable; it becomes 1 when a mother answered that she chose the facility because she or her relatives had used it before.

4.3. Reasons for Choice of Facilities

In the survey, we sought to find the reasons for the choice of facilities. We provided a multiple-response questionnaire and asked mothers to indicate all the reasons. Table 3 summarizes the results.

Four reasons are considered with respect to the choice of kindergarten. The first reason is the accessibility to the kindergarten. If a mother considers the accessibility to a kindergarten as an important factor, then the number of kindergartens she chooses between (the number of her options) reduces. In contrast, if a mother is willing to use a school bus service, then there are more options available. In this case, we expect that a mother uses information from friends more effectively when she has more options.

We have also included two additional reasons. We asked the mothers whether they chose the facility because it takes care of their children for a good amount of time, or whether it is the content of education that influences the choice of kindergarten.

We consider two reasons for the choice of children's clinics. The first reason is accessibility and the second is the waiting time. The doctors' consultation fee is

approximately the same everywhere, but the waiting time varies across clinics. We will examine whether mothers who are concerned about the waiting time use information from friends more frequently.

5. Results

We employ logistic models to analyze the difference in the use of information from friends. Table 4 presents the results of the choice of kindergarten while Table 5 presents the result pertaining to the choice of children's clinics.

5.1. Choice of Kindergarten

Model 1 is the basic model of the choice of kindergarten. In this model, none of the socioeconomic variables are statistically significant. Thus, the difference in the use of information from friends cannot be explained by socioeconomic variables. Both the brother-sister and relative use variables are statistically significant. Their signs become negative, as we predicted in Section 3. Thus, if a mother knows about the service quality in advance, she will not use information from her friends.

With regard to reasons for choice, the result shows that the mother who considers accessibility as an important factor uses information from friends less frequently. In contrast, the mother who takes account of the availability of a bus service uses information from friends more frequently. These results support our prediction. Thus, a mother uses information from friends more effectively when she has more options on the facility choice.

Model 2 includes kindergarten fixed effects. The estimation result demonstrates that the mothers under kindergarten 4, 5, and 6 use information from their friends less frequently. After including the kindergarten fixed effects, the reason of content of education becomes statistically significant.

5.2. Choice of Children's Clinics

Table 5 presents the estimation results of the choice of children's clinics. The first row in Model 3 shows that the mother's age influences her behavior. The negative sign implies that younger mothers use information from friends more frequently. In addition, we find that her spouse's income influences her behavior. The results demonstrate that mothers use information from friends more frequently when their spouse's income is high. Both the brother-sister and relative use variables take negative signs. Hence, these variables influence communication between mothers in the same manner as in the choice of kindergarten.

With regard to reasons for choice, we find that mothers who consider that accessibility to the clinic is important use information from friends less frequently. In contrast, mothers who considers that a short waiting time is important use information from friends more frequently.

Model 4 includes the kindergarten fixed effects. The result demonstrates that the mothers with children in kindergartens 1 and 6 use information from friends more frequently. Therefore, the kindergarten fixed effects on choice of children's clinics works differently from the ones on the choice of kindergarten.

Some mothers choose a clinic based on the evaluation of the mothers of their children's classmates. When a mother contacts a group of mothers with good communication skills, she may begin to communicate actively with them. We examine whether such network externalities exist in word-of-mouth communication between mothers.

For each kindergarten classroom, we calculated the proportion of mothers who used information from friends in choosing a kindergarten. We use this variable to measure the communication skills of mothers. If network externalities matter, then this variable is bound to influence the behavior of mothers in the classroom. We expect that mothers use information from friends more frequently when they are surrounded by friendly mothers.

A mother's own communication skills also influence her behavior. To take account of it, we consider the circumstances surrounding the use of information from friends in choosing a kindergarten. Thus, if a mother's communication skills are good, she uses information from friends in choosing a kindergarten as well as a clinic. In each kindergarten, a child is randomly assigned to a class. Therefore, a mother cannot choose her friends herself. Therefore, we do not have to deal with a self selection problem in the current analysis. However, mothers do not choose a kindergarten and a children's clinic at the same time. She may choose the clinic based on the information obtained from other mothers. However, she will not choose a kindergarten based on the information obtained from other mothers at the clinic. Therefore, we do not have to deal with a simultaneity problem in the current analysis.

Model 5 examines network externalities in word-of-mouth communication between mothers. The variable of a mother's own ability becomes positive and significant. This result implies that the mother who uses information from friends in choosing the kindergarten tends to also use information from this source on the choice of clinics. In contrast, the variable of classmates' ability becomes positive but insignificant. Therefore, we do not observe network externalities.

6. Conclusion

People converse with friends and exchange information. The reputation of facility services often spreads by such word of mouth. In this paper, we focus on the group which intensively uses the word-of-mouth information. We further identify the characteristics of the mother who uses information from friends.

We find that a mother actively uses information from friends if she does not have sufficient information about facilities and also when she has more options on the facility choice.

Mothers with good communication skills use information from friends both on the choice of kindergarten as well as the clinic. Communication skills of mothers are partially explained by her socioeconomic characteristics. We find that both a mother's age and her spouse's income influence her behavior on the choice of children's clinics. Moreover, the communication skills of mothers in the children's classroom do not influence their behavior on the choice of clinics. Thus, network externalities are not observed in word-of-mouth communication among mothers.

Acknowledgment

The paper was presented at the 6th international conference of the Japan Economic Policy Association. We thank Hideyuki Tanaka for useful suggestions.

References

Angrist, J. D. and Lang, K. (2004) Does School Integration Generate Peer Effects? Evidence from Boston's Metco Program, *American Economic Review* v94, n5 1613–34.

Arcidiacono, P. and Nicholson, S. (2005) Peer Effects in Medical School, *Journal of Public Economics* v89, n2–3 327–350.

Fafchamps, M. and Minten, B. (2001) Social Capital and Agricultural Trade, *American Journal of Agricultural Economics* v83, n3 680–685.

Fafchamps, M. and Minten, B. (2002) Returns to Social Network Capital Among Traders, *Oxford Economic Papers* v54, n2 173–206.

Glaeser, E. L., Sacerdote, B. and Scheinkman, J. A. (1996) Crime and Social Interactions, *Quarterly Journal of Economics* v111, n2 507–548.

Hoxby, C. (2000) Peer Effects in the Classroom: Learning from Gender and Race Variation, *NBER Working Paper* #7867.

Manski, C. F. (2000) Economic Analysis of Social Interactions, *Journal of Economic Perspectives* v14, n3 118–136.

Miguel, E., Gertler, P., and Levine, D. I. (2005) Does Social Capital Promote Industrialization? Evidence from a Rapid Industrializer, *Review of Economics and Statistics* v87, n4 754–62.

Narayan, D. and Pritchett, L. (1999) Cents and Sociability: Household Income and Social Capital in Rural Tanzania, *Economic Development and Cultural Change* v47, n4 871–97.

Sacerdote, B. (2001) Peer Effects with Random Assignment: Results for Dartmouth Roommates, *Quarterly Journal of Economics* v116, n2 681–704.

Winston, G. C. and Zimmerman, D. J. (2003) Peer Effects in Higher Education, *NBER Working Paper* #9501.

Zimmerman, D. J. (2003) Peer Effects in Academic Outcomes: Evidence from a Natural Experiment, *Review of Economics and Statistics* v85, n1 9–23.

Table 1. Methods of finding facilities

Answers (multiple-response questions)	Kindergarten			Children's Clinic		
	Yes	No	Missing ^a	Yes	No	Missing ^a
1. Brother or sister used the facility	416 <i>27.90%</i>	1075 <i>72.10%</i>	1 <i>0.1%</i>	260 <i>17.40%</i>	1215 <i>81.40%</i>	17 <i>1.1%</i>
2. Passed by the facility	304 <i>20.40%</i>	1187 <i>79.60%</i>	1 <i>0.1%</i>	623 <i>41.80%</i>	852 <i>57.10%</i>	17 <i>1.1%</i>
3. Through the introduction of acquaintances	567 <i>38.0%</i>	924 <i>61.90%</i>	1 <i>0.1%</i>	621 <i>41.60%</i>	854 <i>57.20%</i>	17 <i>1.1%</i>
4. Informative magazines	92 <i>6.20%</i>	1399 <i>93.80%</i>	1 <i>0.1%</i>	26 <i>1.70%</i>	1449 <i>97.10%</i>	17 <i>1.1%</i>
5. Internet	89 <i>6.00%</i>	1402 <i>94.00%</i>	1 <i>0.1%</i>	21 <i>1.40%</i>	1454 <i>97.5%</i>	17 <i>1.1%</i>
6. Other sources	311 <i>20.80%</i>	1180 <i>79.10%</i>	1 <i>0.1%</i>	171 <i>11.50%</i>	1304 <i>87.40%</i>	17 <i>1.1%</i>

Note.

a. Missing data.

Table 2. Statistical Summary

Kindergarten	1	2	3	4	5	6	Total
Information from Friends ^a							
Kindergarten	36.3%	27.0%	36.2%	28.7%	24.5%	20.2%	31.4%
Children's Clinics	31.7%	33.8%	32.5%	31.1%	33.0%	41.1%	32.9%
Socioeconomic Variables ^b							
Mother's age	34.86	35.21	35.01	35.27	34.81	34.83	34.97
	(3.73)	(3.75)	(3.88)	(3.86)	(3.40)	(3.81)	(3.75)
	<i>1.16%</i>	<i>1.35%</i>	<i>1.85%</i>	<i>1.20%</i>	<i>0.86%</i>	<i>2.42%</i>	<i>1.41%</i>
Mother's education ^c	3.62	3.33	3.69	3.85	3.65	3.28	3.64
	(1.14)	(1.17)	(1.08)	(1.09)	(1.08)	(1.09)	(1.11)
	<i>3.24%</i>	<i>6.76%</i>	<i>4.50%</i>	<i>3.59%</i>	<i>3.86%</i>	<i>6.45%</i>	<i>4.83%</i>
Spouse Income ^d	4.90	4.46	5.07	4.88	4.74	4.76	4.88
	(1.80)	(1.64)	(1.89)	(1.65)	(1.63)	(1.99)	(1.79)
	<i>6.71%</i>	<i>12.16%</i>	<i>10.85%</i>	<i>7.57%</i>	<i>7.30%</i>	<i>12.90%</i>	<i>8.78%</i>
Mother's job	6.48%	10.81%	6.08%	6.37%	4.29%	8.87%	6.50%

Note.

- a. The percentage of mothers who used information from their friends.
- b. The first figure, the figure within parentheses, and the percentage in italics denote the mean, standard deviation, and the percentage of missing data, respectively.
- c. The last school attended: 1 = middle school, 2 = high school, 3 = technical school, 4 = community college, 5 = college, and 6 = graduate school.
- d. Monthly income: 1 = below ¥10,000 (\$833), 2 = ¥100,000~¥199,999 (\$833~\$1665), 3 = ¥200,000~¥299,999 (\$1,666~\$2,498), 4 = ¥300,000~¥399,999 (\$2,499~\$3,333), 5 = ¥400,000~¥499,999 (\$3,334~\$4,167), 6 = ¥500,000~¥599,999 (\$4,168~\$5,000), 7 = ¥600,000~¥699,999 (\$5,001~\$5,833), 8 = ¥700,000~¥799,999 (\$5,834~\$6,667), and 9 = above ¥799,999 (\$6,668).
- e. The percentage of mothers with a monthly income more than ¥100,000 (\$833).

Table 3. Reasons for choice of facilities

Reasons for choice (multiple-response questions)	Yes	No	Missing ^a
Kindergarten			
1. Located close to the house	674 45.2%	816 54.7%	2 0.1%
2. School bus is available.	829 55.6%	661 44.3%	2 0.1%
3. Taking care of children for a good amount of time	143 9.6%	1347 90.3%	2 0.1%
4. Content of education	766 51.3%	724 48.5%	2 0.1%
Children's Clinic			
1. Located close to the house.	890 59.7%	586 39.3%	16 1.1%
2. Waiting time is short.	305 20.4%	1171 78.5%	16 1.1%

Note.

a. Missing Data.

Table 4. Information from friends (Choice of Kindergarten)

	Model 1		Model 2	
Socioeconomic Variable				
Mother's age	-0.012	(0.008)	-0.010	(0.008)
Mother's education	0.007	(0.056)	0.018	(0.056)
Mother's job	-0.044	(0.259)	-0.080	(0.261)
Spouse's income	0.007	(0.033)	0.000	(0.033)
Ex ante information				
Brother-Sister Use	-2.085***	(0.194)	-2.094***	(0.195)
Relative Use	-2.755***	(0.519)	-2.825***	(0.521)
Reasons for choice				
Located close to the house	-0.478***	(0.132)	-0.362***	(0.139)
School bus is available	0.389***	(0.133)	0.395***	(0.139)
Taking care of children for a good amount of time	0.321	(0.211)	0.074	(0.225)
Content of Education	0.166	(0.125)	0.264**	(0.133)
Kindergarten-specific Effects				
2			0.278	(0.338)
3			-0.005	(0.172)
4			-0.444***	(0.198)
5			-0.542***	(0.207)
6			-0.536***	(0.280)
Number of samples ^a	1407		1407	
Chi-squared test	249.378*** (df = 9)		263.645*** (df = 14)	

Note.

a. We deleted the samples with missing data.

*, **, and *** denote significance that 10%, 5%, and 1% levels, respectively.

Table 5. Information from friends (Choice of Children's Clinic)

	Model 3		Model 4		Model 5	
Socioeconomic Variable						
Mother's age	-0.014*	(0.007)	-0.017**	(0.008)	-0.028***	(0.009)
Mother's education	0.071	(0.054)	0.082	(0.054)	0.053	(0.056)
Mother's job	-0.344	(0.262)	-0.388	(0.263)	-0.410	(0.267)
Spouse's income	0.065**	(0.032)	0.069**	(0.032)	0.068**	(0.033)
Ex ante information						
Brother-Sister Use	-1.799***	(0.223)	-1.833***	(0.224)	-1.663***	(0.227)
Relative Use	-2.319***	(0.476)	-2.377***	(0.476)	-2.365***	(0.479)
Reasons for choice						
Located close to the house	-0.904***	(0.121)	-0.913***	(0.122)	-0.906***	(0.126)
Short waiting time	0.365***	(0.145)	0.353***	(0.146)	0.327***	(0.150)
Communication Skills						
Mother's own skills					0.474**	(0.136)
Skills of other mothers					0.628	(0.477)
Kindergarten-specific Effect						
2			0.602*	(0.311)	0.694**	(0.317)
3			0.025	(0.164)	0.030	(0.169)
4			-0.034	(0.188)	0.075	(0.196)
5			0.084	(0.189)	0.259	(0.197)
6			0.540**	(0.237)	0.811***	(0.255)
Number of samples ^a	1393		1393		1343	
Chi-squared test	191.128*** (df = 7)		200.268*** (df = 12)		208.014*** (df = 14)	

Note.

a. We deleted the samples with missing data.

*, **, and *** denote significance that 10%, 5%, and 1% levels, respectively.