



## Determinants of Personality Traits of School-Age Children: Evidence from Japanese Students at Age 12\*

Masakazu HOJO<sup>†</sup>

### Abstract

It has been widely recognized among economists that non-cognitive ability, such as self-control, self-esteem, and personality traits, has a great power in predicting social and economic success. Using survey data from students at age 12 and their parents living in Japan, this paper explores the determinants of personality traits of school-age children. Personality traits are measured by students' answers for questions concerning daily and school life, and we constructed five measures of personality traits corresponding to the Big Five: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. We estimated a regression model of personality traits based on the standard regression model of so-called education production function. We found that personality traits can be hardly explained by the variables used in the standard regression model of the education production function, e.g., education level of parents, the number of siblings, household income, and educational expenditures. We also found that the explanatory power of the regression model can be improved by adding variables concerning students' daily behavior and parents' attitude to their children as regressors, although this does not imply a strict causal relationship.

## 1 Introduction

It has been widely recognized among economists that non-cognitive ability, such as self-control, self-esteem, and personality traits, has a great power in predicting social and economic success (Heckman and Kautz, 2013; Borghans et al., 2008). Recent studies show the

---

\*This research is partially funded by a grant from the Japanese Government Ministry of Education, Science, Sports, and Culture, Grant-in-Aid for Scientific Research (C), No.16K03697.

<sup>†</sup>Faculty of Economics, Niigata University. Address: 8050 Ikarashi-Nincho, Nishi-ku, Niigata 950-2181 Japan. E-mail: hojo@econ.niigata-u.ac.jp

importance of family environment and sports activities in childhood in the formation process of non-cognitive skills and personality traits (Almlund et al., 2011; Carneiro et al., 2007; Cunha and Heckman, 2008; Cabane and Clark, 2015).

Empirical research focusing on Japan in the literature has been limited. Kume et al. (2014) explores the determinants of personality traits for adults using retrospective data and show that family and school environment in childhood affect personality traits in adulthood. Toda et al. (2014) show that family environment in childhood and personality traits affect educational attainment and wage income. Lee and Ohtake (2014) find that some of the personality traits measured by the Big Five affect wage income and promotion in workplace.<sup>1</sup>

This paper explores the determinants of personality traits using a unique dataset collected from Japanese students at age 12. The use of student survey data enables us to directly relate childhood family and school environment to childhood personality traits. This also enables us to avoid bias caused by the use of retrospective data. Our empirical analysis show that personality traits can be hardly explained by the variables used in the standard regression model of the education production function, e.g., education level of parents, the number of siblings, and educational expenditures. We also find that the explanatory power of the regression model can be improved by adding variables concerning student's daily behavior and parent's attitude/practices to their children as regressors. In addition, our results show that the determinants of personality traits might differ between male and female students.

The remainder of the paper is structured as follows. Section 2 describes the data and Section 3 presents our econometric model. Section 4 presents and discuss the empirical results. Section 5 concludes the paper.

## 2 Data

We use a unique dataset collected from students at age 12 and their parents living in Japan.<sup>2</sup> The survey was conducted in 2007. About 1,500 students in the sixth grade (the last grade of primary schooling) were randomly sampled from students nationwide. Although the primary purpose of the survey was to collect information on student's and their parent's attitude to the

---

<sup>1</sup>The Big Five personality traits are Neuroticism (Emotional Stability), Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. See Almlund et al. (2011, Table 1) for details.

<sup>2</sup>The data for this secondary analysis, "Survey of Junior High School Selection, Benesse Educational Research & Development Institute," was provided by the Social Science Japan Data Archive, Center for Social Research and Data Archives, Institute of Social Science, The University of Tokyo.

choice of junior high school, i.e., advancing to a public school or taking entrance examination of private schools, the survey also gathered broad information on students' daily life, strong and weak point, psychological and physical condition, relationship with parents, and so on. Parents were also surveyed to collect information on their behavior to and relationship with their children. Basic information such as family structure and parental socioeconomic status were also surveyed.

To be more precise, each sampled students were asked to answer about 230 questions in the student questionnaire concerning time use in daily life, activities out of school, attitude to the choice of junior high school, activities at school, relationship with parents, self-rated physical and psychological condition, strong and weak points, and so on. Parents of the sampled students were also asked to answer about 270 questions in the parent questionnaire concerning the frequency of playing with their children, evaluation of the school their children were attending, attitude to sending their children to private preparatory schools, family structure, household income, educational attainment, current occupation, and so on.

Personality traits of the students are measured by the answers of 15 questions below.

1. Do you feel emotionally stressed in daily life?
2. Do you worry too much about small things in daily life?
3. Do you feel easily depressed in daily life?
4. Are you proactively engaged in classroom activities?
5. Are you good at making new friends?
6. Are you good at delivering your opinion to your classmates?
7. Are you good at thinking how to solve difficult question?
8. Are you good at exploring what you don't know?
9. Are you good at finding an idea which other person does not conceive?
10. Are you good at having discussions with your friends?
11. Would you like to do good for others in the future?
12. When you see someone being bullied, do you want to help him/her?

13. Are you easily bored in daily life?
14. Are you good at making plans for studying?
15. Are you good at keeping on your study plans?

Students are asked to answer these questions by four point Likert scale, i.e., Strongly agree, Agree, Disagree, and Strongly disagree. From answers to these 15 questions, we construct five variables corresponding to the Big Five: Neuroticism (questions 1, 2, and 3), Extraversion (questions 4, 5, and 6), Openness to Experience (questions 7, 8, and 9), Agreeableness (questions 10, 11, and 12), and Conscientiousness (questions 13, 14, and 15). After assigning large values to positive answers, answers were standardized. Then, we calculated average value of three standardized answers for each five variables and again standardized the average values.<sup>3</sup> We use these average values as proxy variables for personality traits of the students.

Table 1 shows summary statistics for the variables used in the empirical analysis. After dropping students with missing observation, the total number of observations (students) is 936. As will be discussed below, we consider student's daily behavior as a determinant of the personality traits. Three types of student's daily behavior are considered: the time use in one usual day, the frequency of particular activities in one usual week, and out-of-school cultural lessons. The time use in one usual day consists of seven behaviors: playing with friends, watching TV, playing video games, reading comics, reading books (except comics), using computers, and having a family talk. The answer for the time use in one usual day goes as follows: very little, 30 minutes, one hour, one hour and 30 minutes, two hours, two hours and 30 minutes, three hours, three hours and 30 minutes, four hours, and more than four hours. We assign 0 for "very little", 0.5 for "30 minutes", 1 for "one hour", 1.5 for "one hour and 30 minutes", . . . , and 5 for "more than four hours". The frequency of particular activities in one usual week consists of six activities: reading newspaper, watching news program on TV, playing sports, listening music, having breakfast with families, having dinner with families, and helping families. The answer for the frequency of these activities in one usual week goes as follows: 0 day (very little), 1 or 2 days, 3 or 4 days, 5 or 6 days, and 7 days (almost every day). We assign 0 for "0 day (very little)", 1.5 for "1 or 2 days", 3.5 for "3 or 4 days", . . . , and 7 for "7 days (almost every day)". Out-of-school cultural lessons

---

<sup>3</sup>Cronbach's alpha of the five variables range from 0.53 to 0.72.

consist of six activities: music, sports, English conversation, calligraphy, abacus, and other kind of lessons. Each out-of-school lesson is measured as a dummy variable which takes the value of 1 when students regularly go these lessons.

In addition to the daily behavior of students, we also consider parent's attitude and behavior as determinants of the personality traits of students. Parental attitude to their children is measured by student's answers to 9 questions below (for mothers and fathers separately).

How much are the following valid for your father/mother?

1. praise me a lot
2. fun and interesting
3. play with me very often
4. help my study
5. listen to my problem
6. cherish my family
7. understand my feelings
8. interfere in everything
9. expect me to get a good grade at school

Students are asked to answer these questions by four point Likert scale, i.e., Strongly valid, Valid, Not valid, and Strongly not valid. After assigning large values to positive answers, answers were standardized, and then average values are calculated for fathers and mothers respectively.<sup>4</sup>

In addition to the parental attitude evaluated by children, we control for parental practice reported by parents. Parental practice is measured by parent's answers to 15 questions below.

How much do you and your spouse do the following to your children in daily life?

---

<sup>4</sup>Cronbach's alpha is 0.83 for fathers and 0.80 for mothers.

1. help study
2. check the content of study
3. check grades of examination
4. encourage to read books
5. purchase educational material
6. take to museum
7. make opportunity to experience in nature or outdoor activity
8. set an end time of watching TV or playing video games
9. let children to participate in community activities
10. let children to help housework
11. play sports together
12. make things together
13. listen to children's problem
14. engage in school events
15. help school management (e.g., parent-teacher association (PTA) activities)

Parents (respondents) are asked to answer these questions by four point Likert scale, i.e., Usual, Sometimes, Rarely, Never. After assigning large values to positive answers, answers were standardized, and then an average value is calculated.<sup>5</sup>

---

<sup>5</sup>Cronbach's alpha is 0.80.

### 3 Empirical model

In order to explore the determinants of personality traits, we consider the following regression models:

$$PT_i = \alpha + x_i\beta + \epsilon_i, \quad (1)$$

$$PT_i = \alpha + x_i\beta + DB_i\delta + \omega_i, \quad (2)$$

$$PT_i = \alpha + x_i\beta + DB_i\delta + PA_i\gamma + \varphi_i, \quad (3)$$

where  $PT_i$  indicates the personality traits (proxy variable of the Big Five) of student  $i$ ,  $x_i$  is a vector of explanatory variables which are frequently used in the estimation of so-called education production functions (e.g., the number of siblings, household income, educational expenditure, parental education, and parental occupational status),  $DB_i$  is a vector of student's daily behavior variables discussed in the previous section, and  $PA_i$  indicates the parental attitude/practice also discussed above. Although some of explanatory variables might be endogenous, it is impossible to find appropriate instrumental variables in the dataset. Therefore, we apply OLS to all the estimations below.

If the formation process of personality traits is similar to that of cognitive ability such as academic achievement, then equation (1) would be expected to have sufficient explanatory power. Oppositely, if the formation of personality traits differs from that of cognitive ability, then equation (1) might have insufficient explanatory power, while equations (2) and (3) might have higher explanatory power by introducing student's daily behavior and parental practices.

### 4 Estimation results

Table 2 reports OLS estimation results. The estimation results on Neuroticism, Extraversion, and Agreeableness show that most of the explanatory variables in vector  $x$ , i.e., variables which are commonly used in the estimation of education production functions, do not have any significant effects. In the case of Neuroticism, all variables in vector  $x$  are statistically insignificant. In the case of Extraversion and Agreeableness, only a few variables such as educational expenditure and maternal education are statistically significant. On the other

hand, in the case of Openness to Experience and Conscientiousness, it is found that household income and parental education have statistically significant effects. The effect of educational expenditure is also significant in the regression of Openness to Experience. However, the explanatory power of the regression of equation (1) seems quite low: the adjusted  $R^2$  range from  $-0.002$  to  $0.022$ . In other words, personality traits of the students can be scarcely accounted for by the commonly used variables of educational *inputs*.

The regression results of equation (2), in which the student's daily behavior variables are added to the explanatory variable, show a great improvement in the explanatory power of the regression: the adjusted  $R^2$  range from  $0.080$  to  $0.140$ . In addition, it is found that many of the student's daily behavior variables have statistically significant effects with expected signs. The longer time use in watching TV, playing video games, and reading comics tend to have negative effect on personality traits, while the opposite is true when students spend longer time in reading books, watching news program on TV, and playing sports. In addition, out-of-school English lesson has a positive effect on Openness to Experience, while out-of-school calligraphy lesson has a positive effect on Conscientiousness. These effects are interesting and seem reasonable, although they do not necessarily imply a strict causal effect of student's daily behavior on their personality traits.

The estimation results of equation (3), in which the parental attitude and practices are incorporated into the explanatory variable, show mixed results. Except in the case of Neuroticism, the explanatory power of the regression increase: the adjusted  $R^2$  range from  $0.163$  to  $0.189$ . It is shown that mother's attitude strongly affects children's personality traits, while father's attitude and parental practice do not have any significant effects. On the other hand, there seems no increase in the explanatory power of the regression in the case of Neuroticism.

According to the estimation results reported in Table 2, the effect of female dummy variable is not stable: it is positive and significant in the case of Neuroticism and Agreeableness, negative and significant in the case of Openness to Experience, and statistically insignificant in the case of Extraversion and Conscientiousness. These results may imply that the formation process of personality traits differs between male and female students. Table 3 reports estimation results of equation (3) for male and female samples. The most important change can be found in the effect of household income. Except in the case of



Extraversion, the effect of household income is statistically significant only for female. In the case of Extraversion, household income only affects male students. Interestingly and counterintuitively, higher household income is positively associated with Neuroticism and is negatively associated with Agreeableness for female students. In addition, Neuroticism increases and Extraversion decreases for female students when mother is full-time homemaker. Overall, the results reported in Table 3 show a considerable difference between gender in the formation process of personality traits.

## 5 Conclusion

In this paper, we explored the determinants of personality traits of school-age children, using survey data from students at age 12 and their parents living in Japan. We estimated a regression model of personality traits based on the standard regression model of so-called education production function. We found that personality traits can be hardly explained by the variables used in the standard regression model of the education production function, e.g., education level of parents, the number of siblings, household income, and educational expenditures. We also found that the explanatory power of the regression model can be improved by adding variables concerning student's daily behavior and parent's attitude/practices to their children as regressors. In addition, our results showed that the determinants of personality traits might differ between male and female students. Our estimation results do not imply causal relationships between personality traits and explanatory variables. Investigation of the causal relationship remains for future research.

## References

- Almlund, Mathilde, Angela Lee Duckworth, James J. Heckman, and Tim Kautz (2011) "Personality psychology and economics," *Handbook of the Economics of Education*, Volume 4. E. A. Hanushek, S. J. Machin and L. Woessmann, eds. Amsterdam: North Holland, Elsevier Science, pp. 1-182.
- Borghans, Lex, Angela Lee Duckworth, James J. Heckman, and Bas ter Weel (2008) "The Economics and Psychology of Personality Traits," *Journal of Human Resources* vol. 43 no. 4, pp. 972-1059.
- Carneiro, Pedro, Claire Crawford, and Allisa Goodman (2007) "The Impact of Early Cognitive and Non-cognitive Skills on Later Outcomes," CEE Discussion Paper 0092.
- Cabane, Charlotte and Andrew E. Clark (2015) "Childhood Sporting Activities and Adult Labour-Market Outcomes," *Annals of Economics and Statistics* No. 119-120, pp. 123-148.
- Cunha, Flavio and James J. Heckman (2008) "Formulating, Identifying and Estimating the Technology of Cognitive and Noncognitive Skill Formation," *Journal of Human Resources* 43(4), pp. 738-782.
- Heckman, James J. and Tim Kautz (2013) "Fostering and Measuring Skills: Interventions That Improve Character and Cognition," NBER Working Paper No. 19656.
- Kume, Koichi, Chie Hanaoka, Noriko Mizutani, Fumio Ohtake, and Naoko Okuyama (2014) "The determinants of personality traits: experience from family, school, and workplace," *Journal of Behavioral Economics and Finance* vol. 7, pp. 50-54 (in Japanese).
- Lee, Sun Youn and Fumio Ohtake (2014) "The effect of personality traits and biological factors on schooling, earnings and career promotion," RIETI Discussion Paper Series 14-E-023.
- Toda, Akihito, Kotaro Tsuru, and Koichi Kume (2014) "The effect of family environment and non-cognitive skills in childhood on educational attainment, employment and earnings," RIETI Discussion Paper Series 14-J-019 (in Japanese).

Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	Minimum	Maximum
Neuroticism	-0.017	1.016	-1.747	2.138
Extraversion	0.014	1.007	-2.697	1.765
Openness to Experience	0.029	1.019	-2.001	1.980
Agreeableness	-0.002	0.999	-3.469	1.669
Conscientiousness	0.021	1.028	-1.792	2.241
Female	0.514	0.500	0	1
Number of siblings = 1	0.092	0.289	0	1
Number of siblings = 2	0.552	0.498	0	1
Number of siblings = 3	0.294	0.456	0	1
Number of siblings $\geq 4$	0.062	0.241	0	1
HH income $\leq 2$ million yen	0.011	0.103	0	1
HH income 2-4 million yen	0.131	0.338	0	1
HH income 4-6 million yen	0.312	0.464	0	1
HH income 6-8 million yen	0.274	0.446	0	1
HH income 8-10 million yen	0.145	0.353	0	1
HH income $\geq 10$ million yen	0.127	0.333	0	1
Monthly educational expenditure	1.960	2.302	0	40
Father's education: junior high school	0.021	0.145	0	1
Father's education: high school	0.358	0.480	0	1
Father's education: vocational school	0.113	0.317	0	1
Father's education: 2-year college	0.033	0.179	0	1
Father's education: university or more	0.471	0.499	0	1
Mother's education: junior high school	0.004	0.065	0	1
Mother's education: high school	0.403	0.491	0	1
Mother's education: vocational school	0.158	0.365	0	1
Mother's education: 2-year college	0.253	0.435	0	1
Mother's education: university or more	0.181	0.385	0	1
Father's occupation: professional	0.183	0.387	0	1
Father's occupation: non-manual	0.183	0.387	0	1
Mother: full-time homemaker	0.066	0.249	0	1
Play with friends	1.068	0.967	0	5
Watch TV	1.940	1.185	0	5
Play video games	0.661	0.873	0	5
Read comics	0.418	0.577	0	5
Read books (except comics)	0.371	0.513	0	5
Use computers	0.369	0.625	0	5
Have a family talk	1.209	1.181	0	5
Read newspaper	1.645	2.426	0	7
Watch news program on TV	4.282	2.714	0	7
Play sports	2.842	2.471	0	7
Listen music	2.774	2.718	0	7
Have breakfast with families	5.025	2.782	0	7
Have dinner with families	6.268	1.704	0	7
Help families	3.070	2.518	0	7
Culture lesson: music	0.230	0.421	0	1
Culture lesson: sports	0.509	0.500	0	1
Culture lesson: English	0.221	0.415	0	1
Culture lesson: calligraphy	0.201	0.401	0	1
Culture lesson: abacus	0.066	0.248	0	1
Culture lesson: other	0.046	0.210	0	1
Father's attitude	-0.001	0.998	-3.154	2.271
Mother's attitude	0.001	1.007	-3.547	2.448
Parental practice	0.064	1.000	-5.003	2.654

Note: The number of observations is 936. Monthly educational expenditure is measured in ten thousand yen (US\$1 $\approx$ 100 yen).

Table 2: OLS estimation results

	Neuroticism					
Female	0.202	(0.067)**	0.146	(0.083)†	0.154	(0.082)†
# of siblings = 2	0.065	(0.115)	0.081	(0.110)	0.080	(0.108)
# of siblings = 3	0.025	(0.124)	0.077	(0.118)	0.071	(0.117)
# of siblings ≥ 4	-0.192	(0.154)	-0.084	(0.153)	-0.096	(0.155)
HH income 2-4 million yen	0.114	(0.337)	-0.048	(0.309)	-0.046	(0.319)
HH income 4-6 million yen	0.257	(0.332)	0.157	(0.306)	0.143	(0.315)
HH income 6-8 million yen	0.297	(0.336)	0.168	(0.310)	0.162	(0.320)
HH income 8-10 million yen	0.140	(0.343)	-0.030	(0.316)	-0.038	(0.326)
HH income ≥ 10 million yen	0.445	(0.348)	0.270	(0.322)	0.264	(0.332)
Monthly educational expenditure	-0.010	(0.013)	-0.017	(0.015)	-0.016	(0.016)
Father's education: junior high school	0.115	(0.268)	0.226	(0.272)	0.201	(0.269)
Father's education: vocational school	0.086	(0.113)	0.042	(0.112)	0.042	(0.112)
Father's education: 2-year college	0.176	(0.184)	0.089	(0.169)	0.078	(0.174)
Father's education: university or more	0.012	(0.087)	0.009	(0.082)	0.008	(0.082)
Mother's education: junior high school	0.112	(0.848)	0.355	(0.694)	0.362	(0.707)
Mother's education: vocational school	0.095	(0.103)	0.120	(0.101)	0.118	(0.101)
Mother's education: 2-year college	-0.121	(0.089)	-0.130	(0.087)	-0.130	(0.087)
Mother's education: university or more	-0.122	(0.105)	-0.118	(0.104)	-0.123	(0.104)
Father's occupation: professional	-0.032	(0.088)	-0.003	(0.085)	0.003	(0.084)
Father's occupation: non-manual	-0.075	(0.090)	-0.103	(0.088)	-0.103	(0.089)
Mother: full-time homemaker	0.182	(0.147)	0.175	(0.146)	0.168	(0.146)
Play with friends			-0.060	(0.036)†	-0.056	(0.036)
Watch TV			0.024	(0.031)	0.017	(0.031)
Play video games			0.138	(0.045)**	0.143	(0.045)**
Read comics			0.006	(0.063)	0.001	(0.063)
Read books (except comics)			-0.039	(0.069)	-0.035	(0.068)
Use computers			0.119	(0.055)*	0.115	(0.055)*
Have a family talk			-0.049	(0.034)	-0.039	(0.034)
Read newspaper			0.029	(0.015)*	0.029	(0.015)†
Watch news program on TV			0.035	(0.012)**	0.036	(0.012)**
Play sports			-0.078	(0.016)**	-0.076	(0.016)**
Listen music			0.006	(0.014)	0.007	(0.014)
Have breakfast with families			0.006	(0.012)	0.008	(0.012)
Have dinner with families			-0.044	(0.019)*	-0.043	(0.019)*
Help families			-0.027	(0.014)*	-0.025	(0.014)†
Culture lesson: music			0.127	(0.086)	0.132	(0.086)
Culture lesson: sports			0.102	(0.076)	0.106	(0.076)
Culture lesson: English			-0.075	(0.079)	-0.069	(0.079)
Culture lesson: calligraphy			0.000	(0.087)	0.004	(0.088)
Culture lesson: abacus			0.100	(0.133)	0.098	(0.134)
Culture lesson: other			-0.245	(0.145)†	-0.236	(0.148)
Father's attitude					-0.061	(0.094)
Mother's attitude					-0.003	(0.095)
Parental practice					-0.001	(0.036)
Constant term	-0.359	(0.351)	0.015	(0.370)	-0.022	(0.379)
adj.R-squared	0.008		0.080		0.081	
Observations	936		936		936	

Table 2: OLS estimation results (continued)

	Extraversion					
Female	0.003	(0.067)	0.009	(0.082)	-0.011	(0.080)
# of siblings = 2	0.014	(0.111)	-0.013	(0.107)	-0.001	(0.108)
# of siblings = 3	-0.020	(0.118)	-0.035	(0.114)	-0.003	(0.116)
# of siblings $\geq$ 4	-0.104	(0.168)	-0.069	(0.164)	0.002	(0.162)
HH income 2–4 million yen	0.165	(0.236)	0.284	(0.233)	0.319	(0.226)
HH income 4–6 million yen	0.205	(0.223)	0.247	(0.224)	0.330	(0.217)
HH income 6–8 million yen	0.213	(0.226)	0.249	(0.228)	0.291	(0.221)
HH income 8–10 million yen	0.157	(0.236)	0.171	(0.236)	0.248	(0.229)
HH income $\geq$ 10 million yen	0.150	(0.247)	0.246	(0.244)	0.314	(0.239)
Monthly educational expenditure	0.022	(0.014)	0.038	(0.015)*	0.036	(0.018)*
Father's education: junior high school	0.057	(0.277)	0.040	(0.265)	0.077	(0.251)
Father's education: vocational school	-0.040	(0.118)	0.056	(0.112)	0.057	(0.107)
Father's education: 2-year college	-0.143	(0.193)	-0.073	(0.197)	-0.015	(0.185)
Father's education: university or more	0.056	(0.086)	0.021	(0.083)	0.020	(0.080)
Mother's education: junior high school	-0.765	(0.555)	-1.190	(0.450)**	-1.225	(0.508)*
Mother's education: vocational school	-0.006	(0.105)	0.002	(0.102)	-0.000	(0.100)
Mother's education: 2-year college	0.201	(0.089)*	0.154	(0.087)†	0.150	(0.085)†
Mother's education: university or more	0.084	(0.109)	0.060	(0.105)	0.085	(0.103)
Father's occupation: professional	0.012	(0.084)	-0.029	(0.080)	-0.051	(0.078)
Father's occupation: non-manual	-0.017	(0.096)	-0.059	(0.091)	-0.045	(0.088)
Mother: full-time homemaker	-0.067	(0.128)	-0.112	(0.123)	-0.099	(0.121)
Play with friends			0.072	(0.035)*	0.062	(0.034)†
Watch TV			-0.075	(0.031)*	-0.049	(0.029)†
Play video games			-0.018	(0.045)	-0.034	(0.043)
Read comics			-0.195	(0.060)**	-0.160	(0.057)**
Read books (except comics)			0.100	(0.067)	0.088	(0.066)
Use computers			0.013	(0.058)	0.030	(0.055)
Have a family talk			0.072	(0.030)*	0.025	(0.029)
Read newspaper			-0.024	(0.014)†	-0.021	(0.013)
Watch news program on TV			0.020	(0.012)	0.017	(0.012)
Play sports			0.058	(0.016)**	0.049	(0.015)**
Listen music			0.047	(0.013)**	0.039	(0.012)**
Have breakfast with families			0.027	(0.013)*	0.015	(0.013)
Have dinner with families			0.010	(0.021)	0.005	(0.021)
Help families			0.030	(0.014)*	0.019	(0.013)
Culture lesson: music			-0.029	(0.083)	-0.055	(0.082)
Culture lesson: sports			0.107	(0.071)	0.094	(0.069)
Culture lesson: English			0.124	(0.077)	0.106	(0.076)
Culture lesson: calligraphy			0.049	(0.083)	0.031	(0.081)
Culture lesson: abacus			0.013	(0.122)	0.038	(0.120)
Culture lesson: other			0.270	(0.157)†	0.204	(0.151)
Father's attitude					0.058	(0.080)
Mother's attitude					0.211	(0.082)*
Parental practice					0.034	(0.032)
Constant term	-0.289	(0.247)	-1.007	(0.313)**	-0.867	(0.306)**
adj.R-squared	-0.002		0.104		0.167	
Observations	936		936		936	

Table 2: OLS estimation results (continued)

	Openness to Experience					
Female	-0.146	(0.066)*	-0.220	(0.077)**	-0.228	(0.077)**
# of siblings = 2	-0.039	(0.115)	-0.069	(0.110)	-0.062	(0.112)
# of siblings = 3	-0.121	(0.123)	-0.108	(0.118)	-0.089	(0.120)
# of siblings ≥ 4	-0.308	(0.182)†	-0.241	(0.176)	-0.201	(0.177)
HH income 2-4 million yen	0.389	(0.233)†	0.476	(0.172)**	0.509	(0.176)**
HH income 4-6 million yen	0.463	(0.227)*	0.476	(0.166)**	0.539	(0.170)**
HH income 6-8 million yen	0.480	(0.231)*	0.489	(0.171)**	0.525	(0.175)**
HH income 8-10 million yen	0.488	(0.240)*	0.485	(0.185)**	0.564	(0.189)**
HH income ≥ 10 million yen	0.573	(0.248)*	0.647	(0.195)**	0.704	(0.199)**
Monthly educational expenditure	0.025	(0.014)†	0.031	(0.013)*	0.030	(0.013)*
Father's education: junior high school	-0.411	(0.197)*	-0.419	(0.203)*	-0.449	(0.192)*
Father's education: vocational school	-0.050	(0.122)	0.018	(0.112)	0.022	(0.110)
Father's education: 2-year college	0.095	(0.226)	0.094	(0.221)	0.127	(0.208)
Father's education: university or more	0.109	(0.083)	0.044	(0.078)	0.042	(0.077)
Mother's education: junior high school	-0.099	(0.262)	-0.700	(0.268)**	-0.683	(0.292)*
Mother's education: vocational school	0.134	(0.104)	0.142	(0.098)	0.139	(0.097)
Mother's education: 2-year college	0.165	(0.090)†	0.094	(0.087)	0.093	(0.086)
Mother's education: university or more	0.141	(0.103)	0.060	(0.099)	0.089	(0.099)
Father's occupation: professional	-0.081	(0.086)	-0.137	(0.080)†	-0.150	(0.080)†
Father's occupation: non-manual	-0.036	(0.095)	-0.104	(0.086)	-0.089	(0.084)
Mother: full-time homemaker	-0.063	(0.145)	-0.057	(0.137)	-0.061	(0.142)
Play with friends			-0.039	(0.035)	-0.048	(0.035)
Watch TV			-0.096	(0.032)**	-0.078	(0.031)*
Play video games			-0.030	(0.041)	-0.044	(0.039)
Read comics			-0.160	(0.053)**	-0.129	(0.053)*
Read books (except comics)			0.338	(0.063)**	0.331	(0.061)**
Use computers			0.103	(0.058)†	0.116	(0.056)*
Have a family talk			0.032	(0.030)	-0.004	(0.030)
Read newspaper			0.007	(0.014)	0.009	(0.014)
Watch news program on TV			0.056	(0.012)**	0.055	(0.012)**
Play sports			0.053	(0.016)**	0.046	(0.016)**
Listen music			0.029	(0.014)*	0.021	(0.013)
Have breakfast with families			0.007	(0.013)	-0.001	(0.013)
Have dinner with families			0.007	(0.021)	0.001	(0.020)
Help families			0.016	(0.014)	0.009	(0.013)
Culture lesson: music			-0.018	(0.084)	-0.041	(0.084)
Culture lesson: sports			0.031	(0.070)	0.031	(0.069)
Culture lesson: English			0.151	(0.077)*	0.145	(0.077)†
Culture lesson: calligraphy			0.123	(0.082)	0.102	(0.079)
Culture lesson: abacus			0.049	(0.117)	0.068	(0.118)
Culture lesson: other			0.376	(0.141)**	0.311	(0.146)*
Father's attitude					-0.073	(0.074)
Mother's attitude					0.275	(0.078)**
Parental practice					-0.009	(0.032)
Constant term	-0.426	(0.251)†	-0.913	(0.269)**	-0.808	(0.265)**
adj.R-squared	0.022		0.140		0.176	
Observations	936		936		936	

Table 2: OLS estimation results (continued)

	Agreeableness					
Female	0.187	(0.066)**	0.191	(0.078)*	0.178	(0.075)*
# of siblings = 2	0.054	(0.120)	0.017	(0.118)	0.033	(0.118)
# of siblings = 3	0.167	(0.127)	0.133	(0.126)	0.168	(0.128)
# of siblings $\geq$ 4	0.036	(0.183)	0.050	(0.178)	0.127	(0.166)
HH income 2–4 million yen	-0.236	(0.283)	-0.182	(0.285)	-0.127	(0.242)
HH income 4–6 million yen	-0.234	(0.275)	-0.250	(0.278)	-0.150	(0.232)
HH income 6–8 million yen	-0.248	(0.276)	-0.288	(0.280)	-0.233	(0.234)
HH income 8–10 million yen	-0.369	(0.282)	-0.429	(0.287)	-0.319	(0.242)
HH income $\geq$ 10 million yen	-0.519	(0.288) <sup>†</sup>	-0.461	(0.291)	-0.370	(0.246)
Monthly educational expenditure	0.015	(0.013)	0.030	(0.012)*	0.029	(0.012)*
Father's education: junior high school	0.256	(0.215)	0.271	(0.194)	0.259	(0.187)
Father's education: vocational school	-0.129	(0.124)	-0.037	(0.116)	-0.034	(0.113)
Father's education: 2-year college	-0.075	(0.211)	-0.043	(0.218)	0.019	(0.214)
Father's education: university or more	0.058	(0.084)	0.026	(0.082)	0.024	(0.079)
Mother's education: junior high school	0.206	(0.428)	-0.116	(0.401)	-0.133	(0.446)
Mother's education: vocational school	-0.011	(0.103)	-0.005	(0.101)	-0.011	(0.098)
Mother's education: 2-year college	0.101	(0.089)	0.032	(0.086)	0.028	(0.083)
Mother's education: university or more	-0.019	(0.105)	-0.083	(0.103)	-0.049	(0.098)
Father's occupation: professional	0.041	(0.085)	-0.005	(0.082)	-0.027	(0.077)
Father's occupation: non-manual	-0.048	(0.094)	-0.097	(0.088)	-0.075	(0.085)
Mother: full-time homemaker	0.112	(0.138)	0.072	(0.132)	0.074	(0.135)
Play with friends			0.060	(0.034) <sup>†</sup>	0.050	(0.033)
Watch TV			-0.082	(0.031)**	-0.054	(0.030) <sup>†</sup>
Play video games			0.030	(0.040)	0.012	(0.041)
Read comics			-0.142	(0.058)*	-0.097	(0.055) <sup>†</sup>
Read books (except comics)			0.137	(0.063)*	0.126	(0.059)*
Use computers			0.090	(0.053) <sup>†</sup>	0.108	(0.050)*
Have a family talk			0.082	(0.027)**	0.029	(0.027)
Read newspaper			0.003	(0.013)	0.006	(0.013)
Watch news program on TV			0.032	(0.012)*	0.029	(0.012)*
Play sports			0.042	(0.017)*	0.032	(0.016) <sup>†</sup>
Listen music			0.022	(0.014)	0.011	(0.013)
Have breakfast with families			0.032	(0.013)*	0.018	(0.012)
Have dinner with families			-0.018	(0.021)	-0.025	(0.019)
Help families			0.044	(0.014)**	0.032	(0.013)*
Culture lesson: music			0.080	(0.083)	0.048	(0.079)
Culture lesson: sports			0.163	(0.070)*	0.155	(0.066)*
Culture lesson: English			0.017	(0.078)	0.003	(0.076)
Culture lesson: calligraphy			0.054	(0.079)	0.030	(0.075)
Culture lesson: abacus			-0.044	(0.125)	-0.011	(0.119)
Culture lesson: other			0.187	(0.132)	0.096	(0.124)
Father's attitude					-0.061	(0.087)
Mother's attitude					0.361	(0.090)**
Parental practice					0.027	(0.032)
Constant term	0.032	(0.297)	-0.578	(0.345) <sup>†</sup>	-0.427	(0.301)
adj.R-squared	0.004		0.103		0.189	
Observations	936		936		936	

Table 2: OLS estimation results (continued)

	Conscientiousness					
Female	0.040	(0.068)	-0.042	(0.080)	-0.045	(0.079)
# of siblings = 2	0.095	(0.115)	0.049	(0.111)	0.061	(0.112)
# of siblings = 3	0.087	(0.124)	0.072	(0.118)	0.094	(0.120)
# of siblings $\geq$ 4	0.027	(0.163)	0.042	(0.161)	0.093	(0.162)
HH income 2-4 million yen	0.210	(0.251)	0.348	(0.198) <sup>†</sup>	0.393	(0.228) <sup>†</sup>
HH income 4-6 million yen	0.374	(0.243)	0.427	(0.187)*	0.493	(0.218)*
HH income 6-8 million yen	0.363	(0.246)	0.435	(0.192)*	0.474	(0.222)*
HH income 8-10 million yen	0.281	(0.254)	0.339	(0.201) <sup>†</sup>	0.418	(0.231) <sup>†</sup>
HH income $\geq$ 10 million yen	0.464	(0.267) <sup>†</sup>	0.639	(0.218)**	0.705	(0.244)**
Monthly educational expensiture	-0.003	(0.015)	-0.000	(0.015)	-0.001	(0.014)
Father's education: junior high school	-0.454	(0.219)*	-0.431	(0.211)*	-0.464	(0.216)*
Father's education: vocational school	-0.207	(0.120) <sup>†</sup>	-0.109	(0.116)	-0.108	(0.112)
Father's education: 2-year college	0.166	(0.192)	0.192	(0.170)	0.231	(0.153)
Father's education: university or more	0.002	(0.085)	-0.073	(0.080)	-0.076	(0.078)
Mother's education: junior high school	0.340	(0.436)	-0.051	(0.340)	-0.059	(0.372)
Mother's education: vocational school	0.150	(0.103)	0.158	(0.098)	0.151	(0.095)
Mother's education: 2-year college	0.219	(0.090)*	0.150	(0.087) <sup>†</sup>	0.147	(0.085) <sup>†</sup>
Mother's education: university or more	0.070	(0.110)	-0.013	(0.109)	0.010	(0.108)
Father's occupation: professional	0.065	(0.085)	-0.017	(0.082)	-0.029	(0.080)
Father's occupation: non-manual	-0.026	(0.095)	-0.081	(0.092)	-0.063	(0.089)
Mother: full-time homemaker	-0.091	(0.151)	-0.097	(0.138)	-0.101	(0.141)
Play with friends			-0.024	(0.036)	-0.029	(0.036)
Watch TV			-0.113	(0.031)**	-0.097	(0.031)**
Play video games			-0.067	(0.035) <sup>†</sup>	-0.077	(0.035)*
Read comics			-0.188	(0.060)**	-0.156	(0.061)*
Read books (except comics)			0.301	(0.069)**	0.295	(0.067)**
Use computers			-0.021	(0.053)	-0.011	(0.052)
Have a family talk			0.046	(0.030)	0.012	(0.030)
Read newspaper			0.007	(0.015)	0.008	(0.014)
Watch news program on TV			0.041	(0.012)**	0.039	(0.012)**
Play sports			0.047	(0.016)**	0.041	(0.016)*
Listen music			0.014	(0.014)	0.007	(0.014)
Have breakfast with families			0.033	(0.013)**	0.024	(0.013) <sup>†</sup>
Have dinner with families			0.017	(0.021)	0.012	(0.021)
Help families			0.028	(0.014)*	0.020	(0.014)
Culture lesson: music			0.003	(0.081)	-0.019	(0.080)
Culture lesson: sports			0.012	(0.072)	0.010	(0.072)
Culture lesson: English			0.181	(0.078)*	0.176	(0.079)*
Culture lesson: calligraphy			0.178	(0.081)*	0.163	(0.081)*
Culture lesson: abacus			0.107	(0.125)	0.130	(0.121)
Culture lesson: other			0.138	(0.142)	0.074	(0.152)
Father's attitude					-0.106	(0.080)
Mother's attitude					0.287	(0.083)**
Parental practice					0.021	(0.033)
Constant term	-0.498	(0.268) <sup>†</sup>	-1.025	(0.280)**	-0.938	(0.299)**
adj.R-squared	0.008		0.132		0.163	
Observations	936		936		936	

Note: OLS estimates are reported. Figures in parentheses are standard errors robust to heteroscedasticity. Stars indicate statistical significance as follows: \*\* 1%, \* 5%, <sup>†</sup> 10% level.



Table 3: OLS estimation results by gender

	Neuroticism			
	Male		Female	
# of siblings = 2	0.153	(0.179)	0.056	(0.145)
# of siblings = 3	0.070	(0.187)	0.130	(0.162)
# of siblings $\geq$ 4	-0.221	(0.227)	-0.007	(0.234)
HH income 2–4 million yen	-0.622	(0.631)	0.307	(0.238)
HH income 4–6 million yen	-0.444	(0.630)	0.462	(0.219)*
HH income 6–8 million yen	-0.402	(0.628)	0.502	(0.230)*
HH income 8–10 million yen	-0.514	(0.632)	0.196	(0.256)
HH income $\geq$ 10 million yen	-0.289	(0.642)	0.512	(0.272)†
Monthly educational expenditure	-0.016	(0.019)	-0.019	(0.025)
Father's education: junior high school	0.027	(0.319)	0.487	(0.379)
Father's education: vocational school	0.029	(0.159)	0.056	(0.162)
Father's education: 2-year college	0.366	(0.298)	-0.177	(0.196)
Father's education: university or more	0.097	(0.121)	-0.017	(0.121)
Mother's education: junior high school	-0.469	(0.466)	0.747	(0.747)
Mother's education: vocational school	0.095	(0.147)	0.158	(0.154)
Mother's education: 2-year college	-0.066	(0.129)	-0.191	(0.119)
Mother's education: university or more	-0.275	(0.149)†	0.029	(0.146)
Father's occupation: professional	0.022	(0.123)	-0.015	(0.122)
Father's occupation: non-manual	-0.025	(0.139)	-0.120	(0.124)
Mother: full-time homemaker	0.030	(0.182)	0.440	(0.247)†
Play with friends	-0.059	(0.057)	-0.084	(0.049)†
Watch TV	-0.056	(0.049)	0.083	(0.042)*
Play video games	0.214	(0.060)**	0.120	(0.071)†
Read comics	-0.049	(0.118)	-0.002	(0.078)
Read books (except comics)	-0.021	(0.126)	-0.053	(0.083)
Use computers	0.161	(0.097)†	0.128	(0.071)†
Have a family talk	-0.061	(0.064)	-0.040	(0.042)
Read newspaper	0.022	(0.021)	0.026	(0.022)
Watch news program on TV	0.011	(0.019)	0.047	(0.017)**
Play sports	-0.054	(0.023)*	-0.098	(0.025)**
Listen music	0.029	(0.023)	-0.007	(0.018)
Have breakfast with families	0.016	(0.019)	0.008	(0.017)
Have dinner with families	-0.081	(0.028)**	-0.001	(0.027)
Help families	-0.030	(0.019)	-0.014	(0.020)
Culture lesson: music	0.456	(0.206)*	0.056	(0.097)
Culture lesson: sports	-0.029	(0.114)	0.207	(0.105)†
Culture lesson: English	-0.114	(0.118)	-0.022	(0.111)
Culture lesson: calligraphy	-0.052	(0.166)	0.038	(0.106)
Culture lesson: abacus	0.277	(0.232)	0.075	(0.160)
Culture lesson: other	-0.313	(0.309)	-0.173	(0.187)
Father's attitude	-0.092	(0.143)	-0.004	(0.125)
Mother's attitude	-0.025	(0.139)	0.012	(0.127)
Parental practice	0.072	(0.045)	-0.112	(0.055)*
Constant term	0.824	(0.708)	-0.562	(0.340)†
adj.R-squared	0.077		0.084	
Observations	455		481	

Table 3: OLS estimation results by gender (continued)

	Extraversion			
	Male		Female	
# of siblings = 2	0.126	(0.189)	-0.091	(0.136)
# of siblings = 3	0.288	(0.198)	-0.276	(0.153) <sup>†</sup>
# of siblings ≥ 4	0.054	(0.237)	-0.022	(0.243)
HH income 2-4 million yen	0.520	(0.284) <sup>†</sup>	-0.075	(0.342)
HH income 4-6 million yen	0.631	(0.257)*	-0.065	(0.331)
HH income 6-8 million yen	0.656	(0.253)**	-0.222	(0.335)
HH income 8-10 million yen	0.615	(0.273)*	-0.251	(0.351)
HH income ≥ 10 million yen	0.632	(0.290)*	-0.057	(0.371)
Monthly educational expenditure	0.034	(0.024)	0.023	(0.028)
Father's education: junior high school	-0.396	(0.350)	0.267	(0.299)
Father's education: vocational school	0.092	(0.148)	-0.019	(0.157)
Father's education: 2-year college	0.398	(0.225) <sup>†</sup>	-0.543	(0.270)*
Father's education: university or more	0.106	(0.116)	-0.063	(0.119)
Mother's education: junior high school	0.093	(0.484)	-1.616	(0.709)*
Mother's education: vocational school	-0.123	(0.140)	0.058	(0.146)
Mother's education: 2-year college	-0.092	(0.120)	0.378	(0.118)**
Mother's education: university or more	0.006	(0.154)	0.192	(0.152)
Father's occupation: professional	-0.143	(0.106)	0.027	(0.111)
Father's occupation: non-manual	-0.069	(0.139)	-0.027	(0.119)
Mother: full-time homemaker	0.001	(0.167)	-0.364	(0.162)*
Play with friends	0.060	(0.053)	0.048	(0.047)
Watch TV	-0.097	(0.050) <sup>†</sup>	-0.011	(0.036)
Play video games	-0.072	(0.058)	0.038	(0.063)
Read comics	-0.111	(0.093)	-0.164	(0.070)*
Read books (except comics)	0.116	(0.118)	0.086	(0.083)
Use computers	-0.046	(0.099)	0.046	(0.069)
Have a family talk	0.072	(0.055)	0.011	(0.036)
Read newspaper	-0.016	(0.020)	-0.029	(0.019)
Watch news program on TV	0.016	(0.018)	0.022	(0.017)
Play sports	0.029	(0.022)	0.077	(0.023)**
Listen music	0.031	(0.019)	0.036	(0.016)*
Have breakfast with families	-0.002	(0.019)	0.022	(0.018)
Have dinner with families	0.015	(0.029)	0.002	(0.029)
Help families	0.019	(0.019)	0.023	(0.020)
Culture lesson: music	-0.108	(0.187)	-0.036	(0.096)
Culture lesson: sports	0.141	(0.105)	0.059	(0.095)
Culture lesson: English	0.174	(0.112)	0.064	(0.105)
Culture lesson: calligraphy	-0.062	(0.155)	0.093	(0.097)
Culture lesson: abacus	-0.125	(0.195)	0.085	(0.158)
Culture lesson: other	0.123	(0.297)	0.352	(0.176)*
Father's attitude	0.062	(0.111)	0.046	(0.115)
Mother's attitude	0.235	(0.111)*	0.196	(0.119)
Parental practice	0.050	(0.044)	0.010	(0.047)
Constant term	-1.105	(0.436)*	-0.514	(0.403)
adj.R-squared	0.150		0.190	
Observations	455		481	

Table 3: OLS estimation results by gender (continued)

	Openness to Experience			
	Male		Female	
# of siblings = 2	-0.038	(0.182)	-0.107	(0.151)
# of siblings = 3	0.079	(0.188)	-0.267	(0.163)
# of siblings $\geq$ 4	-0.079	(0.232)	-0.278	(0.297)
HH income 2-4 million yen	0.413	(0.331)	0.502	(0.264) <sup>†</sup>
HH income 4-6 million yen	0.406	(0.318)	0.593	(0.255)*
HH income 6-8 million yen	0.410	(0.306)	0.513	(0.261) <sup>†</sup>
HH income 8-10 million yen	0.387	(0.327)	0.585	(0.286)*
HH income $\geq$ 10 million yen	0.675	(0.339)*	0.726	(0.299)*
Monthly educational expenditure	0.035	(0.015)*	0.025	(0.029)
Father's education: junior high school	-0.668	(0.262)*	-0.351	(0.280)
Father's education: vocational school	-0.114	(0.173)	0.057	(0.137)
Father's education: 2-year college	0.171	(0.241)	0.007	(0.389)
Father's education: university or more	0.076	(0.114)	-0.053	(0.113)
Mother's education: junior high school	0.396	(0.402)	-1.009	(0.400)*
Mother's education: vocational school	0.162	(0.154)	0.107	(0.136)
Mother's education: 2-year college	0.049	(0.127)	0.173	(0.121)
Mother's education: university or more	0.044	(0.143)	0.116	(0.148)
Father's occupation: professional	-0.268	(0.114)*	-0.009	(0.109)
Father's occupation: non-manual	-0.145	(0.126)	-0.021	(0.120)
Mother: full-time homemaker	-0.077	(0.182)	-0.083	(0.218)
Play with friends	0.026	(0.054)	-0.128	(0.048)**
Watch TV	-0.121	(0.049)*	-0.034	(0.042)
Play video games	-0.058	(0.057)	-0.005	(0.062)
Read comics	-0.106	(0.087)	-0.107	(0.079)
Read books (except comics)	0.389	(0.109)**	0.315	(0.081)**
Use computers	0.152	(0.099)	0.090	(0.077)
Have a family talk	-0.037	(0.051)	0.005	(0.039)
Read newspaper	0.016	(0.020)	0.005	(0.021)
Watch news program on TV	0.054	(0.018)**	0.050	(0.016)**
Play sports	0.009	(0.022)	0.097	(0.026)**
Listen music	0.027	(0.021)	0.018	(0.017)
Have breakfast with families	0.017	(0.019)	-0.033	(0.018) <sup>†</sup>
Have dinner with families	0.044	(0.029)	-0.041	(0.029)
Help families	-0.013	(0.020)	0.033	(0.020) <sup>†</sup>
Culture lesson: music	-0.208	(0.166)	0.024	(0.101)
Culture lesson: sports	0.135	(0.101)	-0.060	(0.095)
Culture lesson: English	0.042	(0.114)	0.288	(0.103)**
Culture lesson: calligraphy	0.116	(0.150)	0.116	(0.098)
Culture lesson: abacus	0.337	(0.175) <sup>†</sup>	-0.013	(0.142)
Culture lesson: other	0.258	(0.251)	0.203	(0.189)
Father's attitude	0.008	(0.104)	-0.170	(0.098) <sup>†</sup>
Mother's attitude	0.175	(0.109)	0.376	(0.103)**
Parental practice	0.003	(0.041)	-0.011	(0.051)
Constant term	-0.937	(0.452)*	-0.774	(0.373)*
adj.R-squared	0.147		0.206	
Observations	455		481	

Table 3: OLS estimation results by gender (continued)

	Agreeableness			
	Male		Female	
# of siblings = 2	-0.087	(0.217)	0.161	(0.136)
# of siblings = 3	0.098	(0.226)	0.216	(0.155)
# of siblings ≥ 4	-0.087	(0.249)	0.429	(0.243) <sup>†</sup>
HH income 2-4 million yen	0.162	(0.406)	-0.471	(0.310)
HH income 4-6 million yen	0.241	(0.382)	-0.545	(0.299) <sup>†</sup>
HH income 6-8 million yen	0.188	(0.373)	-0.690	(0.304)*
HH income 8-10 million yen	0.117	(0.386)	-0.742	(0.313)*
HH income ≥ 10 million yen	0.028	(0.395)	-0.746	(0.325)*
Monthly educational expenditure	0.033	(0.015)*	0.024	(0.025)
Father's education: junior high school	-0.116	(0.261)	0.336	(0.241)
Father's education: vocational school	-0.100	(0.165)	-0.019	(0.154)
Father's education: 2-year college	0.272	(0.252)	-0.278	(0.328)
Father's education: university or more	0.183	(0.113)	-0.127	(0.114)
Mother's education: junior high school	1.341	(0.377)**	-0.486	(0.526)
Mother's education: vocational school	-0.225	(0.140)	0.127	(0.141)
Mother's education: 2-year college	-0.165	(0.121)	0.160	(0.114)
Mother's education: university or more	-0.132	(0.155)	0.016	(0.134)
Father's occupation: professional	-0.239	(0.116)*	0.170	(0.108)
Father's occupation: non-manual	-0.224	(0.134) <sup>†</sup>	0.053	(0.118)
Mother: full-time homemaker	0.106	(0.184)	0.000	(0.172)
Play with friends	0.008	(0.053)	0.080	(0.042) <sup>†</sup>
Watch TV	-0.052	(0.051)	-0.065	(0.037) <sup>†</sup>
Play video games	-0.013	(0.058)	0.099	(0.053) <sup>†</sup>
Read comics	-0.036	(0.094)	-0.160	(0.063)*
Read books (except comics)	0.145	(0.106)	0.088	(0.075)
Use computers	0.127	(0.097)	0.068	(0.055)
Have a family talk	0.081	(0.049) <sup>†</sup>	0.014	(0.034)
Read newspaper	0.024	(0.019)	-0.008	(0.019)
Watch news program on TV	0.005	(0.019)	0.053	(0.016)**
Play sports	0.033	(0.025)	0.032	(0.024)
Listen music	0.032	(0.021)	-0.003	(0.016)
Have breakfast with families	0.011	(0.017)	0.027	(0.017)
Have dinner with families	0.003	(0.027)	-0.053	(0.028) <sup>†</sup>
Help families	0.021	(0.018)	0.046	(0.018)*
Culture lesson: music	-0.009	(0.147)	0.048	(0.099)
Culture lesson: sports	0.191	(0.107) <sup>†</sup>	0.095	(0.087)
Culture lesson: English	0.058	(0.120)	-0.053	(0.104)
Culture lesson: calligraphy	0.085	(0.147)	-0.028	(0.090)
Culture lesson: abacus	-0.057	(0.221)	-0.000	(0.148)
Culture lesson: other	0.068	(0.273)	0.157	(0.154)
Father's attitude	-0.115	(0.130)	0.050	(0.108)
Mother's attitude	0.393	(0.136)**	0.249	(0.108)*
Parental practice	0.039	(0.045)	-0.005	(0.045)
Constant term	-0.723	(0.487)	0.121	(0.370)
adj.R-squared	0.178		0.192	
Observations	455		481	

Table 3: OLS estimation results by gender (continued)

	Conscientiousness			
	Male		Female	
# of siblings = 2	-0.036	(0.195)	0.114	(0.143)
# of siblings = 3	0.103	(0.200)	-0.005	(0.158)
# of siblings $\geq$ 4	-0.033	(0.252)	0.290	(0.247)
HH income 2–4 million yen	0.389	(0.398)	0.465	(0.299)
HH income 4–6 million yen	0.348	(0.390)	0.670	(0.282)*
HH income 6–8 million yen	0.328	(0.378)	0.627	(0.292)*
HH income 8–10 million yen	0.299	(0.397)	0.551	(0.306) <sup>†</sup>
HH income $\geq$ 10 million yen	0.708	(0.409) <sup>†</sup>	0.758	(0.325)*
Monthly educational expenditure	0.006	(0.015)	-0.011	(0.027)
Father's education: junior high school	-0.307	(0.249)	-0.787	(0.317)*
Father's education: vocational school	-0.053	(0.155)	-0.252	(0.160)
Father's education: 2-year college	0.405	(0.212) <sup>†</sup>	0.041	(0.237)
Father's education: university or more	-0.069	(0.119)	-0.147	(0.115)
Mother's education: junior high school	0.135	(0.388)	0.042	(0.519)
Mother's education: vocational school	0.085	(0.144)	0.171	(0.134)
Mother's education: 2-year college	0.108	(0.121)	0.215	(0.127) <sup>†</sup>
Mother's education: university or more	0.110	(0.158)	-0.091	(0.157)
Father's occupation: professional	-0.106	(0.113)	0.073	(0.115)
Father's occupation: non-manual	-0.128	(0.129)	0.035	(0.129)
Mother: full-time homemaker	-0.149	(0.175)	-0.044	(0.218)
Play with friends	0.002	(0.054)	-0.035	(0.050)
Watch TV	-0.060	(0.047)	-0.134	(0.043)**
Play video games	-0.148	(0.051)**	0.026	(0.054)
Read comics	-0.156	(0.094) <sup>†</sup>	-0.178	(0.083)*
Read books (except comics)	0.547	(0.122)**	0.143	(0.089)
Use computers	-0.105	(0.088)	-0.001	(0.067)
Have a family talk	0.008	(0.051)	0.010	(0.041)
Read newspaper	0.007	(0.019)	0.018	(0.021)
Watch news program on TV	0.029	(0.019)	0.046	(0.017)**
Play sports	0.037	(0.022) <sup>†</sup>	0.046	(0.026) <sup>†</sup>
Listen music	-0.003	(0.022)	0.007	(0.018)
Have breakfast with families	0.047	(0.018)*	-0.006	(0.019)
Have dinner with families	0.032	(0.029)	-0.013	(0.031)
Help families	-0.020	(0.019)	0.060	(0.021)**
Culture lesson: music	-0.204	(0.178)	0.001	(0.094)
Culture lesson: sports	0.186	(0.111) <sup>†</sup>	-0.148	(0.102)
Culture lesson: English	0.183	(0.119)	0.180	(0.113)
Culture lesson: calligraphy	0.226	(0.145)	0.127	(0.103)
Culture lesson: abacus	0.342	(0.212)	0.032	(0.149)
Culture lesson: other	-0.064	(0.282)	0.067	(0.190)
Father's attitude	-0.014	(0.113)	-0.161	(0.115)
Mother's attitude	0.215	(0.112) <sup>†</sup>	0.322	(0.123)**
Parental practice	0.016	(0.045)	0.019	(0.048)
Constant term	-0.986	(0.489)*	-0.795	(0.396)*
adj.R-squared	0.180		0.158	
Observations	455		481	

Note: OLS estimates are reported. Figures in parentheses are standard errors robust to heteroscedasticity. Stars indicate statistical significance as follows: \*\* 1%, \* 5%, <sup>†</sup> 10% level.