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The Effects of Out-of-School Activities in Elementary School Days on Future Income

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Seira Suzuki*

PhD. Student, Osaka School of International Public Policy (OSIPP)

【Key Word】Out-of-school activity, income, path analysis
【JEL Classification】I24, Z10

【Summery】This paper investigate the effect of out-of-school activity in elementary school days on one's future income. In order to analyze specifically, the model includes extra-curricular activities in junior high school, years of schooling, marital status and occupation. They could be influenced by the activity and also have effects on income. The data used for the analysis is the Preference Parameters Study. Related variables are extract and their relationship is calculated by path analysis. The result is in case of female, cultural activities have significant effect on income via schooling. In case of male, educational and sports activities increase one's future income.

* s-suzuki@osipp.osaka-u.ac.jp

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Seira SUZUKI
(Osaka School of International Public Policy, Osaka University)
1 - 31 Machikaneyama, Toyonaka, Osaka, Japan 560-0043
s-suzuki@osipp.osaka-u.ac.jp

1. Introduction

It is common for Japanese children to dedicate themselves to out-of-school activities such as dancing, playing sports and studying at cram schools. According to the research about the local educational power conducted by Ministry of Education, Culture, Sports, Science and Technology (MEXT) in 2006, 70% of elementary students experience some out-of-school activities on weekdays (MEXT, 2005). Nowadays, more and more parents tend to let their children experience some activities after school. These activities are divided into three categories: cultural experiences, sports experiences, and educational (specialized-school) experiences.

It is said that these activities are effective to one's educational performance (Kataoka, 2015; Matsuoka, 2017). However, since out-of-school activities are additional ones and not all children have opportunity to access to it, it is unavoidable to create the difference between those who experience activities after school and those who do not. Suppose that there is the tendency of reproduction as Shinogaya and Akabayashi (2012) indicates, then out-of-school activities could work as an intermediary for the process. Once the impact of out-of-school activities are measured, we can utilize the data and result with appropriate approach if necessary.

That is the motivation for this research. This paper is constituted of 5 sections: first, the next section reveals the related past research and some points that remain to be solves, second, third section explain the data and method used for the analysis followed by the forth section indicating some major results and discussion, lastly, fifth section conclude with the summary of this paper.

2. Objectives

So far, the effects of these activities have been analyzed separately, especially sports experiences (Umesaki, 2004; Ohtake and Sasaki, 2009), and educational experiences (Naoi, 1978; Seiyama, 1981) were focused on. And there are not many research that analyzed the effect of three types of activities together on one's future outcomes. There are two major reasons for it: first, there were no data about the situation of out-of-school activities until recently, and second, cultural activities have not been regarded to be effective to nurture cognitive skill, which is calculated by academic skills and so on. However, the effects of activities are well connected and because of the recent trend, many people experience the multiple activities in their childhood. In order for the appropriate analysis, those three categories should be analyzed totally. Besides, cultural activities attract attention recently because it could be recognized as means to nurture non-cognitive skills, which affect on performance on labor market along with cognitive skills (Lee and Ohtake, 2014). This makes more important to include cultural activities into analysis.

Another important point of view to discuss this matter is gender. It influences the types of activities experienced. So, the outcome should differ by gender. Furthermore, the process that effect of the out-of-school activity appears on income should be also different. Now, no research has been conducted focusing on the effect of all the activities on one's future performances by gender.

In order to tackle with these problems, this thesis explores the two issues: 1 the effect of out-of-school activities, considering the interaction between cultural activities, sports activities, and educational activities, on one's labor productivities and 2 the difference of their effects by gender.

3. Analysis

The data used for this analysis is a part of Preference Parameters Study conducted by Institute of Social and Economic Research, Osaka University. The variables used are as follows: family background, personal attribute, activities experienced during elementary school, activities dedicated during junior high school, school year, job, marriage, and income. By dividing these variables into six categories, it is allowed to analyze the direct and indirect effects of out-of-school experience in elementary school days on income utilizing the path analysis. The conceptual diagram is shown in Fig.1.

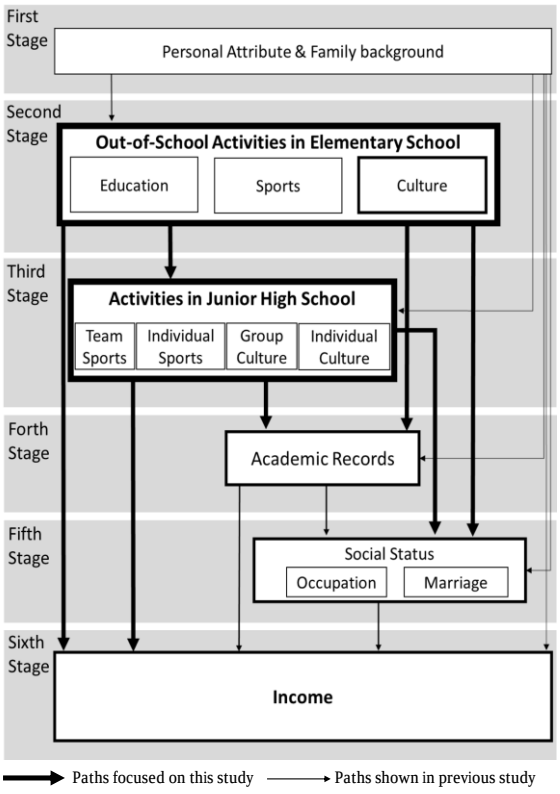


Figure 1 Conceptual Diagram

The analysis subjects are those aged from 35 till 55 in 2013. The questions in 2013 survey are mainly used for the analysis. So, the data is individual cross-sectional data of 2013 combined with questions with regard to one's attribution included in 2011 and 2012 survey.

As for the utilized variables, the first stage of Fig.1 includes living standard in age 15, parents' final academic record, family with double-income, age, city size and number of siblings. In the second and third stage, the activity related questions, the experience of out-of-school activities in elementary school days and the extra activity engaged in junior high school days, are included. In the fourth stage, respondent's years of schooling are used. Dummy variable of marriage and job status[1] are created for the fifth stage. For the sixth stage, household income is used for the income variable. All the variables are described in Table 1 and statistical description is indicated in Table 2.

In order to verify the relationships between activities in elementary days and income as specific as possible, Structural Equation Modeling (SEM) is applied to the analysis. SEM allows us to construct the model which is not clear about the relationship of each variables. The model is created by first connecting all the variables, second dropping the lines without significance. The goodness of the model is confirmed by Akaike Information Criteria (AIC)[2].

[1] The base category is people without any jobs.

[2] AIC is used to check the goodness of the model. The equation of AIC is AIC= −2 lnL + 2k where lnL is the maximized log-likelihood of the model and k is the number of parameters estimated. This way, the smaller the AIC goes, the better the model becomes.

Table 1 Variables and Description

Stage	Variable	Description
1	**Parents_School**	**parents' final academic record**
		9=graduated junior high school;
		12=graduated high school;
		14=graduated college;
		16=graduated university;
		18=graduated master course;
		20=graduated doctor course
	LS15	**living standard in age 15**
		11-scale number
	Parents_Double	**family with double income**
		1=double income; 0=otherwise
	Sibling	**number of siblings**
		sum of the number
	City Size	**city size in living area**
		2.5=living in town;
		7=living in city under 100million citizens;
		50=living in city over 100million citizens;
		100=living in city over 1billion citizens;
	Age	**age**
		from 35 till 55
2	**Elementary Activity**	**category of experience of out-of-school activities in elemetary school days**
		-no experience (base category)
		-only educational activities
		-only sports activities
		-only cultural activities
		-sports and cultural activities
		-sports and educational activities
		-cultural and educaitonal activities
		-all three types of activities
3	**JH_team sports**	**engaged in team sports in junior high school days**
		1=yes; 0=no
	JH_indivi sports	**engaged in individual sports in junior high school days**
		1=yes; 0=no
	JH_group culture	**engaged in cultural group activity in junior high school days**
		1=yes; 0=no
	JH_indivi culture	**engaged in individual cultural activity in junior high school days**
		1=yes; 0=no
4	**Schooling**	**final academic record**
		9=graduated junior high school;
		12=graduated high school;
		14=graduated college;
		16=graduated university;
		18=graduated master course;
		20=graduated doctor course
5	**Marriage**	**marital status**
		1=being married; 0=otherwise
	Job	**category of occupation**
		-management
		-professional
		-white color (office and administrative support, sales, service)
		-blue color (construction, farming, fishing and forestry)
		-others (self employed)
		-housewives/ husbehusband
6	**Income**	**median of each category of household income(yen)**
		50= less than 1 billion;
		150= 1 billion to less than 2 billion;
		300= 2 billion to less than 4 billion;
		500= 4 billion to less than 6 billion;
		700= 6 billion to less than 8 billion;
		900= 8 billion to less than 10 billion;
		1100= 10 billion to less than 12 billion;
		1300= 12 billion to less than 14 billion;
		1500= 14 billion to less than 16 billion;
		1700= 16 billion to less than 18 billion;
		1900= 18 billion to less than 20 billion;
		2500= 20 billion and over

Table 2 Statistical Description

Continuous data

Variables	Mean	SD	Min	Max
Parents_School	2.81	1.56	1	10
LS15	5.14	1.80	0	10
Sibling	1.44	0.81	0	6
City Size	49.27	35.80	2.5	100
Age	46.76	5.55	35	55
Schooling	13.74	1.85	9	21
Income	677.28	378.76	50	3,000

Discrete data

Variables	%
Male	42.74
Parents_Double	75.18
Elementary Activity	
no experience (base)	11.90
only educational activities	5.55
only sports activities	7.45
only cultural activities	22.52
sports and cultural activities	9.60
sports and educational activities	6.66
cultural and educaitonal activities	19.35
all three types of activities	16.97
Junior High Activity	
JH_team sports	46.07
JH_indivi sports	26.49
JH_group culture	17.37
JH_indivi culture	15.23
Marriage	0.84
Job	
management	10.47
professional	16.73
white color	43.30
blue color	9.60
others	7.22
housewives/ househusband	9.99

N=1,261

4. Result and Discussion

First, let us go through the Figure 2 which indicates the result of female estimation. Following the significant path, we can understand the causal relationship of the model[3]. The unique point of the result is cultural experience, cultural and sports experience, cultural and educational experience and all the experience in elementary school days increase the schooling with 1% significant. Also, as the school year extends, household income increases directly and indirectly. Moreover, these activities are affected by their background such as parents schooling.

It is often pointed out the theory of reproduction. The theory is that the children from the family with higher status will also end up with higher status. This result can be said that it reveals one of the reproduction processes of family via the activities in elementary school days.

One of the reasons why cultural activities are effective on school year is the idea of developing non-

[3] All the result is available when requesting author.

cognitive skills. Non-cognitive skill differs from cognitive skills which is calculated by exams. Instead, it is the skill that valued by communication, state of mind and so on. It is said that non-cognitive skill influences on one's productivities like cognitive skills. Cultural activities have been discussed to have influence on community development. In this regard, it is possible that experiencing cultural activities nurture one's non-cognitive skills. Therefore, it has positive effect on schooling although it seems less effective than educational activities.

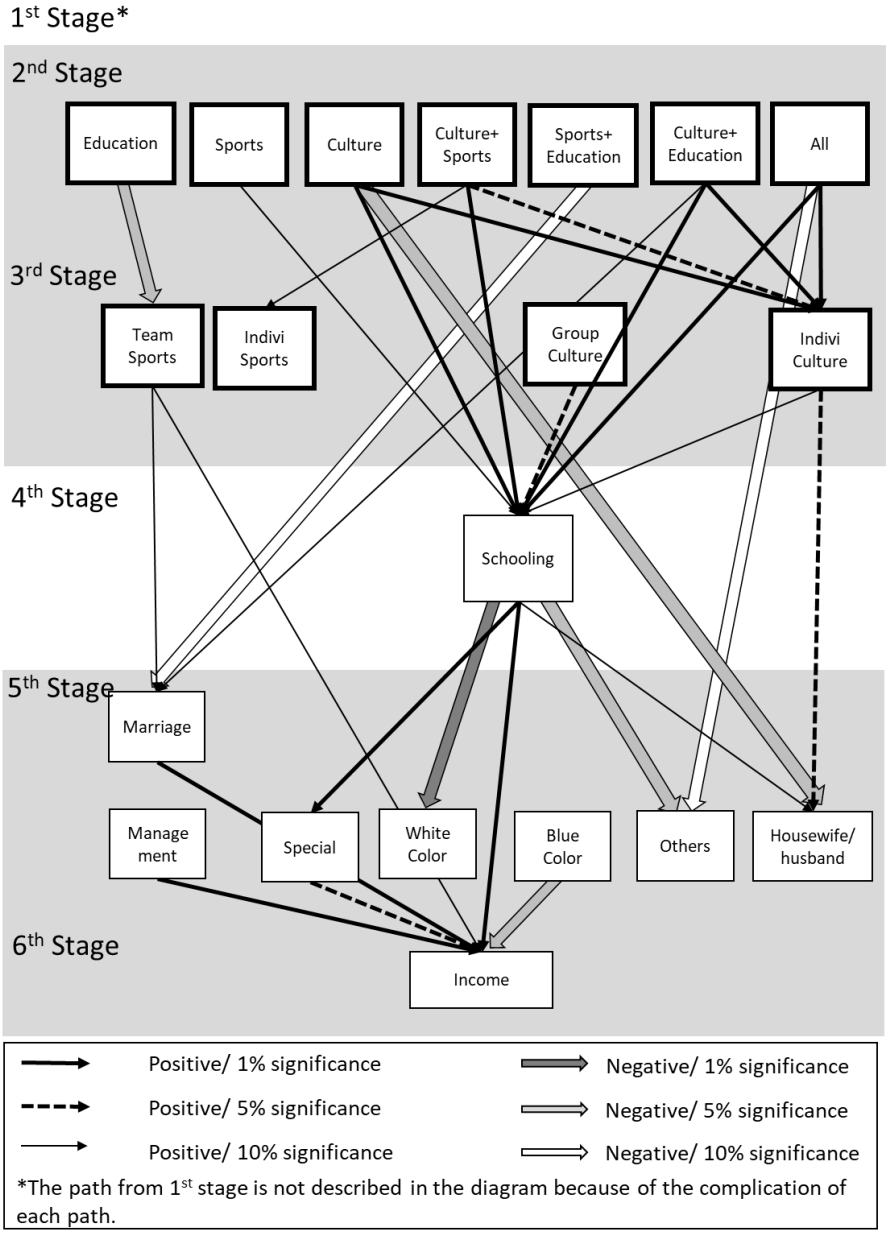
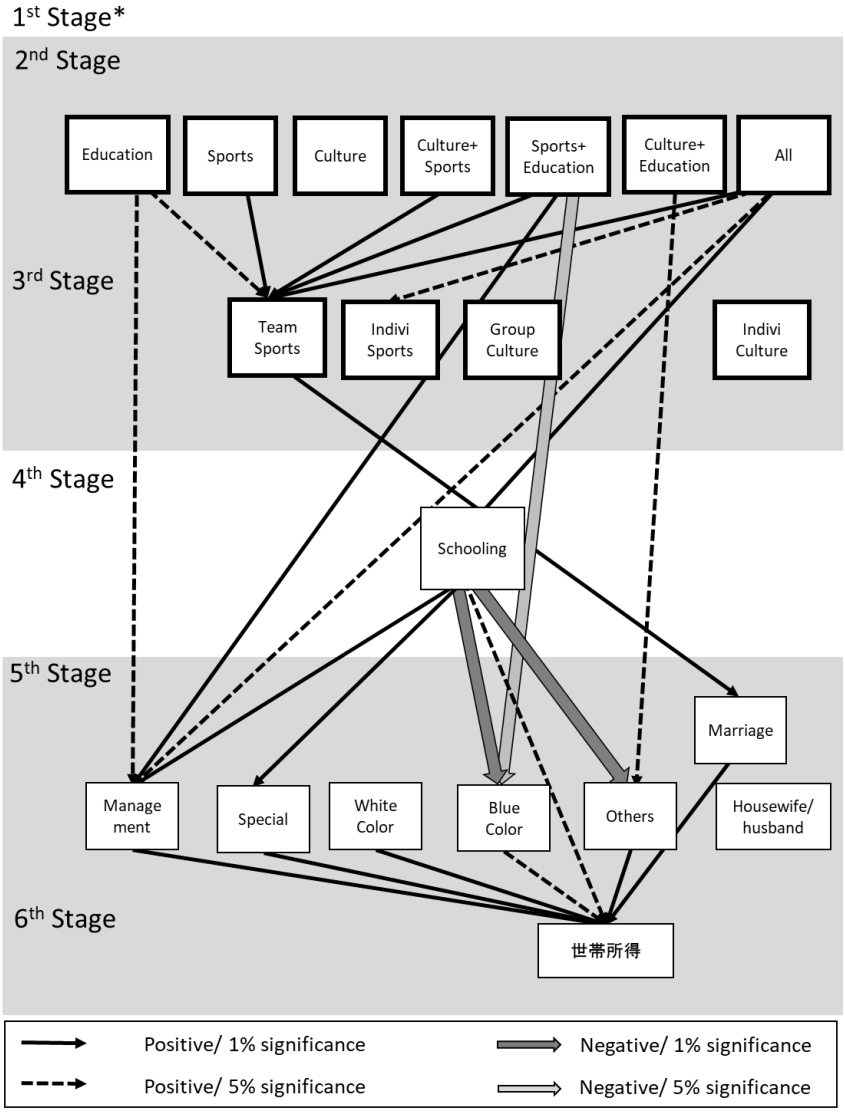


Figure 2 Path Diagram (Female)

Next, in the case of men from Figure 3, educational activities have a synergy with other activities affect directly management position which increase income. Also, experience of all the activities in the elementary school days increase the school year along with income. The difference from female result is those activities are not necessarily related to parents' background.

Another interesting paths are sports experience in elementary school days. All the sports related experience leads to the team sport in junior high school days. And the experience has a positive effect on marital status with

1% significance. It is clear that experience of sports and educational activities in elementary school days increase income in a step-by-step manner via schooling and occupation for male.



*The path from 1st stage is not described in the diagram because of the complication of each path.

Figure 3 Path Diagram (Male)

What is different by gender is that the effect of cultural activities is clear for female, however, there is no significant effect for male. In order to explain the reason behind the result is complex. Kataoka (2001) indicates the different role of cultural activities in young age between boys and girls. The cumulation of cultural capital for girls plays an important role within the family. The research reveals that the cultural experience is influenced by father's social status. This is how the amount of cultural assets for his daughter works as an indicator of higher social status. The tendency is only for girl's case because the effects for boys did not appear clearly.

5. Conclusion

This paper analyzes the effect of cultural, sports and educational activities in elementary school days on income using the nationwide data. It reveals not only direct effect but indirect effect via one's academic process, occupation and marital status owing to path analysis method. As a result, in the case of female, cultural activities

enhance one's school year, which increase the household annual income. In the case of male, educational and sports activities plays an important role to enlarge the income.

There are still some points remain to be seen because of limitations of the data. The main question is how large parents' experience of activities impact on children. Previous study reveals that parents' experience of cultural activities affect their children's experience, however, the effect is not included in this analysis because of the lack of variable. This point is expected to be revealed by the future study.

In conclusion, this result reveals the effect on the income differs by the types of activities in young age so that those activities should be analyzed together. Moreover, the result implies the process of earning human capital by experiencing some out-of-school activities, which are not always related with parental background. However, this means the income gap between those who experience and who do not would increase. Therefore, this paper supports the idea that it needs to find the way to equally distribute the opportunities of experiencing various activities for young people.

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Reference

Bourdieu, Pierre. 1979. La Distinction: Critique sociale du Judgement, Minuit.

Kataoka, Eimi. 2001. "Family Strategy in Educational Attainment Process in Japan: Effects of Cultural Capital and Investment in Extra-School Education" *Japanese Journal of Educational Research*, vol.68 (3), pp.259-273.

Kataoka, Eimi. 2015. "Parental Expenses for Supplemental Education and Correlation with Academic Achievement in Japan" *Journal of the Faculty of Letters*, vol.73, pp.93-114.

Lee, SunYoun., and Ohtake, Fumio. 2014. "The Effects of Personality Traits and Behavioral Characteristics on Schooling, Earnings, and Career Promotion" *RIETI Discussion Paper Series*, 14-E-023.

Matsuoka, Ryoji. 2017. "Japanese Version of Concerted Cultivation Associated with Adaptation to Lower Secondary Education", *RIETI Discussion Paper Series*, 17-E-041.

Ministry of Education, Culture, Sports, Science and Technology (MEXT). 2005. "The practical research on local educational power (*tiiki no kyoiku ryoku ni kansuru chosa*)"
http://www.mext.go.jp/b_menu/shingi/chukyo/chukyo2/003/siryou/06021701/001_2.pdf
(Last viewed 2018/05/06)

Naoi, Atsushi., and Fujita, Hidenori. 1978. "The Effects of Educational Achievement Process on Status Attainment" *Studies of Educational Sociology*, vol.33, pp.91-105.

Ohtake, Fumio., and Sasaki Masaru. 2009. "Sports activity and promotion" *The Japanese journal of labour studies*, No. 587, pp.62-89.

Seiyama, Kazuo. 1981. "A Study of the Effect of Extra－school Educational Investment" The annual reports on cultural science, vol.30, no.1, pp.171-221.

Shinogaya, Keita., and Akabayashi, Hideo. 2012. "The structure of the effects of family background on children's academic ability-An investigation using hierarchical multiple regression analysis and structural equation modeling-" *Panel Data Research Center at Keio University*, SDP2012-007.

Umesaki, Osamu. 2004. "Academic record, club activity and employment: utilizing the alumnus network in new

graduate recruitment (Seiseki/kurabukatsudou to shushoku-Shinki daisotsu sijo ni okeru OB nettowa-ku no riyou)" Matsushige, Hisakazu., ed Empirical Analysis of Effect of Education at University (Daigaku kyouiku kouka no jisshoubunseki), Nippon Hyoron Sha, pp.29-48.