

【論文】

International Comparative Analysis of Vocational Track and Educational Aspiration: The Japanese Character of the ‘Flaccidity of Tracking’

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1. Introduction

This research analyses PISA 2015 data using a tracking theory framework and identifies the international position of how Japanese secondary vocational education limits students’ educational aspirations. The report focuses on secondary vocational education in terms of vocational track.

In recent years, vocational education at the secondary education level has been disappearing from the mainstream. With many countries adopting ladder education systems, people are no longer limited in their educational opportunities and are increasing their levels of academic achievement. Moreover, secondary vocational education is sensitive to changes in the industrial structure, and the knowledge and skills that can be provided by vocational schools are growing stale in modern society, which requires advanced knowledge and skills. Vocational knowledge is often treated as impractical (Grubb and Lazerson, 2009). Even Germany, which traditionally has been known for its rigid, branched education system, is seeing a remarkable reduction in its vocational training schools. In their place, there has been an increase in comprehensive

schools, with secondary vocational education no longer taking the ‘traditional form’ (Urabe, 2012).

According to a review by Halsey (2006), a trend can be seen in many European universities in terms of a shift toward education systems that do not limit peoples’ educational opportunities. Specifically, curriculums in modern secondary education systems have become more diverse and complex in order to support both vocational training and academic education. Higher vocational qualifications are being recognised as equivalent qualifications to the baccalaureate or the German ‘Abitur’, and are emerging as an ‘alternative route’ to going on to university.

This paper will examine this openness of educational opportunities in secondary vocational education from the framework of ‘tracking flaccidity’. Tracking was originally an education system used to homogenise pupils in American secondary education by ability or desired career path in order to funnel them into a post-secondary career path (Rosenbaum, 1976). In this paper, the framework of tracking theory positions secondary vocational education in each country as the vocational track.¹⁾

One of the primary functions of tracking is to suitably socialise pupils assigned to the academic track, general track, and vocational track in accordance with their respective track. For ex-

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ample, pupils assigned to the vocational track would be socialised in a way that gradually reduced their desire to go on to university and encouraged them to choose a path suitable to their track. However, students born with high socioeconomic status are more likely to be assigned to the academic track. In other words, tracking results in an education system that maintains and exacerbates educational inequality due to the path as follows: low socioeconomic status → vocational track → not progressing to university (Rosenbaum, 1976; Oakes, 1985).

Tracking theory in Japan is defined by Fujita (1980: 118) as a higher education system where 'for example, even if a student's path is not legislatively limited like in a streaming education system, in substantive terms the course (school) that is entered will limit the opportunities and scope of that student's later career-path selection.'

In Japan, where the high school enrolment rate surpasses 95%, high school graduation is a major turning point in terms of career-path selection (social differentiation). Junior high school graduates take the high school entrance examination almost at the same time as they graduate from junior high school, and are assigned to various ranks and types of high schools in accordance with their academic ability (exam results) using a method called 'cross-sectional selection (*wagiri senbatsu*)' (Iwaki and Mimizuka, 1983). Immediately upon graduating from high school, the choices they make about whether they will move on to the next stage of education or find employment—and if they are moving on with their education what sort of school will they go to, or if they are going to find work what sort of work they will apply for—will determine the degree of social resources they will

be able to obtain in the future. Moreover, the distribution for each track is determined by social class of origin, and in accordance with tracking theory, their post-graduation career path will be limited by the rank and type of the school in which they enrol. In other words, because high school disparities have the function of fixing and exacerbating inequalities among social classes, identifying the tracking mechanism has clarified the structure of class mobility.

The flaccidity of tracking in Japan was pointed out in the late 1990s and can be understood in a narrow sense as an increase in the numbers of students wishing to progress from the vocational track to university (Mimizuka, 2000), but as was previously stated, this trend is not unique to Japan. In other words, the system that reproduces inequality through tracking is flaccid, which means the openness of educational opportunities on the institutional side is increasing.

Therefore, this paper will focus on the phenomenon of students in the vocational track wishing to go on to university to understand global trends in tracking flaccidity and understand the degree of tracking flaccidity in Japan as compared to other countries. Through this analysis, the paper will examine the openness of educational opportunities at the secondary education level in Japan.

2. A Review of Previous Studies and Establishment of Analysis Themes

2.1 Classification of Educational System by Country

Education systems differ around the world, although they demonstrate some similarities. For example, it is traditionally common in France

for students to repeat a year of school (grade repetition; Kyomen, 2016; Sonoyama, 2018), whereas in Japan, most graduate within the standard study period.²⁾ Both Dupriez et al. (2008) and Taki (2010) have used PISA data to demonstrate how such variations in countries' education systems are related to the formation of students' educational aspirations.

Dupriez et al. (2008) categorise education systems into four models: 1) separation, 2) *à la carte*, 3) uniform integration, and 4) individualised integration. Under the separation model, students are clearly separated into different courses from an early stage in accordance with their future career paths. Under the *à la carte* model, students without clear conditions for advancing will repeat a year (grade repetition), like in France as previously mentioned. Under the uniform integration model, classes are organised through student selection according to their abilities and desired career paths in a comprehensive high school, such as in the USA. Under the individualised integration model, school education is designed as far as possible to equip all students with a minimum academic ability and is distinctive in having little academic disparity between schools, like in Northern European countries.

Expanding on the above list of education system categories, Taki (2010) categorises Japan and South Korea under the additional examination competition model. Several distinctive features that separate the examination competition model from other models. Unlike the separation model, countries using this model have single-track education systems, so even if a student goes to a vocational high school, they will not be institutionally excluded from going on to university, and there is not a strong a link be-

tween vocational high school and vocational qualifications. It differs from the uniform integration and *à la carte* models in that there is comparatively little diversity in schools in each region, and students rarely repeat a year. Unlike the individualised integration model, there is significant academic disparity between schools for students aged 15 years or older (Taki, 2010: 232–233).

2.2 Japanese tracking system under the Examination Competition Model

Within the different education systems outlined above, the formation of educational aspirations based on a student's socioeconomic status through tracking varies slightly. In particular, in an examination competition model like in Japan, disparities between high schools encompass almost all socioeconomic statuses and academic abilities of students, and there is a significant degree of educational aspiration hierarchisation according to the school in which a student is enrolled (Taki, 2010). In other words, as far as an analysis of the PISA data illustrates, the inequality of educational aspiration generated by Japanese tracking is by no means small.

Japan's education system is categorised as an examination competition model because it is characterised by tournament-style university entrance selection at the point of advancement across all school stages (Takeuchi, 1995). In Japan, where the high school enrolment rate surpasses 95%, high school graduation is a major turning point in terms of career-path selection (social differentiation).

However, because Japanese high schools have a single graduation qualification, high school results and diplomas do not constitute an institutional barrier to going on to the next level of ed-

ucation (Fujita, 1980). Moreover, a ‘high-stakes (make or break)’ academic achievement test is the general entrance examination for the Japanese university examination. As such, there is both heating and cooling in operation on students’ educational aspirations within the respective high school tracks in Japan (Takeuchi, 1995).

Through a combination of intermittent selections in the form of ranking from high school and university admissions deviation and the results of practice tests taken repeatedly during the students’ time in junior high and high school, Japanese junior high and high school students do not hold aspirations that deviate remarkably from their academic performance (Kariya, 1986; Takeuchi, 1995). These are the mechanisms of educational aspiration generation in Japan’s examination competition model.

2.3 Research Design

In understanding Japanese tracking, research by Dupriez et al. (2008) and Taki (2010) have been extremely indicative. However, two remaining issues should be pointed out. First, the analysis data is old, and the findings need to be updated. The PISA data used in Dupriez et al. (2008) and Taki (2010) is from the 2003 survey. At that time, the rate of student enrolment in vocational schools in Germany (known for its streaming education system) was 57.2% (Taki, 2010: 233). In comparison, Germany’s rate of student enrolment in vocational schools in the PISA 2015 data used in this study does not exceed 2% (see Table 1). This figure would suggest a rapid decrease in vocational training schools and a rapid rise in comprehensive schools in German society.

Furthermore, a change can also be seen in

the relationship between high schools and universities in Japan. Looking at Japan’s School Basic Survey for each academic year, one can clearly see that progression from vocational high schools to university has only increased slightly since 2000. However, recently some universities have been instituting special recommendation quotas for specialist schools such as technical high schools, and this may be leading to changes in the heating and cooling mechanisms of vocational track enrolment on educational aspiration.

The second issue is regarding the analysis methods. Both the regression model and the hierarchical linear model are commonly used methods in tracking studies (Fujihara, 2015; Taki, 2010, 2011). Of course, analysis methods are often selected in accordance with a study’s aims, and it may not necessarily be inappropriate to use a regression model. However, Hoshino (2009) argues that there are issues with regression models. Studies with many covariates, such as in sociology, run a higher risk of incorrectly establishing regression functions, and it is impossible to obtain estimated values for direct causal results. Instead, they propose the usefulness of an analysis using propensity scores.³⁾ Therefore, this study will analyse tracking effects in the PISA 2015 data using propensity scores.

3. Data and Variables

3.1 Data

This study uses PISA data measured by the OECD in 2015. PISA is a survey of international academic achievement that has been conducted every three years since 2000. It measures students attending school who are at least 15 years

and three months old and at most 16 years and two months old. In Japan, this correlates to students in their first year of high school. PISA is best known for being an international survey of academic achievement, but it also carries out questionnaire surveys of students and schools on matters other than academic ability. That is why it also contains data on students' educational aspirations and the tracks to which they have been assigned.

This paper has limited the scope of its analysis to countries that are members of the OECD and differentiates the school courses taken by students (original variable name: ISCEDO) into general courses and vocational or pre-vocational courses. The countries that fall within the scope of the paper's analysis are the 18 countries illustrated in Table 1.

3.2 Variables and Procedure

The variables used in the analysis are as follows. First, answers to the question, 'Which of the following do you expect to complete?' (original variable name: ST111Q01TA) are used for students' educational aspirations, which is the results variable. The International Standard Classification of Education (ISCED) is then applied to the answer choices.

ISCED is a statistical framework maintained by UNESCO and is classified into the following eight levels: ISCED Level 0: Early childhood education; Level 1: Primary education; Level 2: Lower secondary education; Level 3: Upper secondary education; Level 4: Post-secondary non-tertiary education; Level 5: Short-cycle tertiary education; Level 6: Bachelor's or equivalent level; Level 7: Master's or equivalent level; and Level 8: Doctoral or equivalent level. The issue of interest in this paper concerns progression

from the vocational track to a four-year university course. Consequently, students expecting to attain an education level equivalent to or above Level 6 (Bachelor's) were recorded as 1 and all others were recorded as 0 to proceed with the analysis.

In terms of the treatment variable concerning whether students were in the vocational track, students' school courses were recorded as 1 if they were in a vocational course, and 0 if in a general course. That is, this paper defined the treatment variable depending on whether students are institutionally considered to be on the vocational track or not.

The analysis used four covariates assumed to be related to the treatment variable: mathematical literacy, student's socioeconomic status, student's sex, and whether the student is native to the country in which they are being educated. The specific procedure is as follows.

Mathematical literacy was expressed as the mean value of Plausible Value 1 to Plausible Value 10 in Mathematics (PV1MATH-PV10MATH; Sudo, 2010; Taki, 2010). Therefore, because this paper used math scores as a broad indicator of academic ability, these mean values were calculated and used in the analysis.

In terms of students' socioeconomic information, PISA data includes the ESCS variable, which is a first principal composite score of an index of three variables comprising highest parental education, highest parental occupation, and 14 variables comprising 13 possessions and books in the home (100+ books being the dummy). This variable was used without adjustment. For student sex, the analysis used a male dummy, with female = 0 and male = 1 (original variable name: ST03Q01). Further, the variable W_FSTUWT was used throughout the analysis

for student weighting.⁴⁾

Table 1 illustrates the descriptive statistics of the variables used in this paper by country.

4. Analysis Strategy

This paper's analysis proceeds as follows. The first analysis provided the basic analysis results. In specific terms, it illustrates the proportions by country of students in the vocational track who aspire to go on to earn a bachelor's degree or higher and captures the fundamental relationship between the vocational track and educational aspiration.

However, the results of this basic analysis do not take factors such as students' academic abil-

ity, socioeconomic status, and sex into account. Therefore, the second analysis was a logistic regression analysis where enrolment in the vocational track is 1, and the other is 0. This analysis identified the characteristics of students enrolled in the vocational track and calculated the propensity scores.

Finally, the third analysis used the calculated propensity scores to calculate the average treatment effect of being in the vocational track on educational aspiration. Comparing the average treatment effect by country demonstrates how educational aspiration is heated or cooled by vocational track enrolment and identifies the state of tracking flaccidity by country.

Table 1. Descriptive Statistics Used in Analysis by Country

N	Results variable		Treatment variable		Covariates						
	Desire to proceed to university		Vocational track		Math scores		SES		Male		
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Australia	14530	0.50	0.50	0.15	0.35	482.84	87.82	0.19	0.82	0.51	0.50
Austria	7007	0.26	0.44	0.72	0.45	498.85	87.81	0.10	0.85	0.51	0.50
Belgium	9651	0.33	0.47	0.44	0.50	510.32	91.29	0.19	0.90	0.51	0.50
Czech Republic	6894	0.59	0.49	0.34	0.47	502.56	87.22	-0.14	0.81	0.50	0.50
France	6108	0.33	0.47	0.17	0.38	496.57	89.28	-0.12	0.80	0.49	0.50
Germany	6504	0.19	0.39	0.02	0.15	508.74	83.40	0.14	0.95	0.51	0.50
Greece	5532	0.70	0.46	0.13	0.34	461.69	81.39	-0.02	0.95	0.51	0.50
Hungary	5658	0.38	0.49	0.16	0.37	484.73	86.10	-0.18	0.94	0.50	0.50
Italy	11583	0.34	0.47	0.53	0.50	499.79	83.94	-0.05	0.92	0.50	0.50
Japan	6647	0.59	0.49	0.24	0.43	532.51	82.17	-0.18	0.70	0.50	0.50
South Korea	5581	0.75	0.43	0.16	0.37	523.39	92.69	-0.20	0.68	0.52	0.50
Luxembourg	5299	0.42	0.49	0.16	0.37	486.45	87.97	0.08	1.11	0.49	0.50
Mexico	7568	0.61	0.49	0.28	0.45	413.20	67.23	-1.15	1.21	0.50	0.50
The Netherlands	5385	0.17	0.38	0.25	0.43	513.91	86.49	0.17	0.76	0.50	0.50
Slovenia	6406	0.22	0.42	0.65	0.48	494.42	82.23	-0.08	0.81	0.55	0.50
Switzerland	5860	0.27	0.45	0.13	0.34	519.37	88.50	0.14	0.91	0.52	0.50
Turkey	5895	0.70	0.46	0.43	0.50	415.80	73.63	-1.45	1.17	0.50	0.50
Scotland	3111	0.42	0.49	0.09	0.29	488.93	77.80	0.22	0.84	0.51	0.50

4.1 Basic Analysis of the Educational Aspiration of Vocational Track Students

Table 2 illustrates the proportion of students on the vocational track who want to go on to earn a bachelor's degree or higher according to ISCED classification. The results demonstrate that Japan is positioned roughly at the midway point of the countries included within the scope of analysis.

The countries with low rates of vocational track students who aspire to earn a bachelor's degree or higher are European countries. Starting from the lowest, they are the Netherlands, France, Hungary, Slovenia, Germany, Belgium, Austria, Greece, and Switzerland. These results indicate that in European countries, traditional educational qualifications tend to discourage students from wanting or taking steps to go on to university.

Japan and South Korea appear higher up the list than European countries. Japan has a rate of 22.7%, as illustrated in Table 2. According to the 2015 School Basic Survey, the percentage of high school students who went on to university after graduation reveals figures of 14.0% for agriculture courses, 14.8% for technical courses, 26.1% for business courses, and 14.9% for fishery courses, demonstrating figures close to the 22.7% illustrated in Table 2. As with how Taki (2010) classified Japan as having an examination competition model, Japanese high school students are forming 'appropriate' educational aspirations through tournament-style exam competition up until high school entrance.

Finally, it is worth considering Mexico and Turkey, which demonstrate high figures for educational aspiration. The figures in Table 2 illustrate the high rate of vocational track students aspiring to go on to earn a bachelor's degree or

higher in Mexico and Turkey, at 59.6% and 56.8%, respectively. *Education at a Glance 2017* (OECD, 2017) illustrates that the percentage of students going on to earn a bachelor's degree or higher are approximately 35% in Mexico and 55% in Turkey. As the figures illustrated in Table 2 are only those of vocational track students, this would suggest that their educational aspirations deviate remarkably from their educational achievement.

Therefore, in terms of basic figures, the heating and cooling effect of vocational track enrolment on educational aspiration in Japan and South Korea can be understood to be positioned in the 'middle' when compared globally.

However, the above results do not consider the impact of other factors, including academic

Table 2. The Proportion of Vocational Track Students Aspiring to go onto a Bachelor's Degree or Higher

	Desire to Proceed to Bachelor's Degree or Higher (%)
Mexico	59.6%
Turkey	56.8%
Czech Republic	40.7%
Scotland	34.7%
Luxembourg	32.0%
Australia	31.3%
South Korea	30.9%
Japan	22.7%
Switzerland	17.9%
Greece	14.9%
Italy	14.6%
Austria	13.9%
Belgium	11.2%
Germany	8.9%
Slovenia	8.4%
Hungary	6.2%
France	4.6%
The Netherlands	1.9%

ability, socioeconomic status, and sex. Therefore, let us proceed to an analysis of the treatment effects of vocational track enrolment and the impact of factors that have thus far been excluded.

4.2 Analysis of Vocational Track Allocation Mechanism

It is well known that people born with relatively lower social status are likely to have lower academic ability and be assigned to the vocational track due to a preference for practical learning (Bourdieu and Passeron, 1970). It has been argued that working class views of work, in particular, are easily compatible with traditionally masculine values and that males especially prefer vocational education (Willis, 1977).

Table 3 illustrates the results of the logistic regression analysis in which students on the vocational track are set as 1, and students on the general track are set as 0. The only country for which a significant model for the variables arranged in this study could not be found was Scotland, so it has been excluded from the analysis explanation.

It is not possible to describe the analysis results for each country in detail due to space limitations, but the broad trends are as follows. First, students with lower math scores are more likely to be on the vocational track, with the exception of Luxembourg.⁵⁾ Second, students with lower socioeconomic status were more likely to be on the vocational track. Third, with the exception of Japan, the Czech Republic, Australia, Germany, and Luxembourg, males were more likely to be on the vocational track. Fourth, in many countries, there was no statistical relationship between being on the vocational track and the dummy variable of whether the student was native of their country of education. On the

other hand, it was indicated that in countries where there was a statistical relationship, natives were more likely to be on the vocational track. It was confirmed that these results do not contain any significant inconsistencies with findings from previous studies.

Following this, propensity scores were calculated from the logistic regression analysis in Table 3, and in this case, the focus was placed on the *c*-statistic recorded on the right-hand side of Table 3. The *c*-statistic serves as a condition of whether Strongly Ignorable Treatment Assignment has been satisfied. Strongly Ignorable Treatment Assignment is a precondition for estimating causal effects using propensity scores, and 'the group of assignment depends on the estimated covariate value, and not on the value of the dependent variable' (Hoshino and Okada, 2006: 233). Its value is preferably closer to 1.0; in cases where it presents a remarkably low value, this means there is a high possibility that the entered covariate cannot completely distinguish the presence or absence of the treatment variable of the dependent variable (valid variables remain for treatment allocation).

Hoshino and Okada (2006) argue that as long as the *c*-statistic value is 0.8 or higher, then a sufficiently unbiased adjustment is possible and that in the case of sociology studies, the tolerance level for analysis is when the value exceeds 0.67. The results demonstrate that Switzerland, Mexico, Luxembourg, Germany, and Australia do not satisfy the Strongly Ignorable Treatment Assignment. In other words, the assignment of students to the vocational track in these countries is largely due to factors other than the independent variables in the logistic regression analysis used in this paper. Based on the above results, they will be excluded from

Table 3. Determining Factors of Vocational Track Enrolment (Logistic Regression Analysis)

	Math Scores		SES		Male		Constant		Pseudo R2	c-statistic
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.		
The Netherlands	-0.029	0.001 ***	-0.440	0.063 ***	0.443	0.091 ***	12.346	0.406 ***	0.464 ***	0.925
Slovenia	-0.017	0.001 ***	-1.025	0.046 ***	1.204	0.070 ***	8.559	0.276 ***	0.334 ***	0.867
Hungary	-0.017	0.001 ***	-0.663	0.055 ***	1.331	0.094 ***	4.681	0.295 ***	0.319 ***	0.883
Greece	-0.018	0.001 ***	-0.446	0.052 ***	1.389	0.103 ***	4.847	0.308 ***	0.299 ***	0.877
France	-0.013	0.001 ***	-0.519	0.055 ***	0.561	0.079 ***	3.792	0.250 ***	0.226 ***	0.839
Belgium	-0.012	0.000 ***	-0.369	0.030 ***	0.614	0.049 ***	5.380	0.165 ***	0.199 ***	0.798
Austria	-0.007	0.000 ***	-0.934	0.041 ***	0.822	0.062 ***	4.545	0.205 ***	0.178 ***	0.782
Italy	-0.006	0.000 ***	-0.721	0.026 ***	1.240	0.044 ***	2.640	0.138 ***	0.155 ***	0.758
South Korea	-0.009	0.000 ***	-0.564	0.064 ***	0.163	0.079 *	2.725	0.245 ***	0.150 ***	0.774
Turkey	-0.012	0.000 ***	-0.077	0.026 **	0.521	0.058 ***	4.079	0.202 ***	0.115 ***	0.723
Japan	-0.006	0.000 ***	-0.575	0.047 ***	-0.009	0.061	1.586	0.213 ***	0.075 ***	0.702
Czech Republic	-0.006	0.000 ***	-0.260	0.039 ***	-0.064	0.054	2.087	0.185 ***	0.062 ***	0.677
Germany	-0.003	0.001 **	-0.247	0.109 *	-0.255	0.194	-2.343	0.611 ***	0.019 ***	0.632
Australia	-0.004	0.000 ***	-0.247	0.031 ***	0.026	0.049	-0.009	0.146	0.029 ***	0.626
Luxembourg	0.000	0.001	-0.270	0.039 ***	-0.042	0.079	-1.536	0.267 ***	0.015 ***	0.601
Mexico	0.005	0.000 ***	-0.085	0.023 ***	0.146	0.052 **	-3.129	0.187 ***	0.017 ***	0.593
Switzerland	0.002	0.000 ***	-0.288	0.046 ***	0.324	0.079 ***	-3.315	0.258 ***	0.015 ***	0.591
Scotland	0.000	0.001	-0.031	0.082	0.299	0.129 *	-2.498	0.433 ***	0.003 <i>n.s.</i>	0.541

Notes: *p<.05 **p<.01 ***p<.001; Shading is applied when the c-statistic is 0.67 or lower.

the propensity analysis score in the following chapter.

4.3 Results of Propensity Score Analysis

The results of the propensity score analysis are illustrated in Table 4. The average treatment effect, found mid-table, indicates the effect size of vocational track enrolment on educational aspiration after adjusting for the variables used in the logistic regression analysis in Table 3. The fact that the signs for the figures within the table are all negative demonstrates that stu-

dents' educational aspiration is dragged down by the treatment of being on the vocational track in all of the countries analysed. Table 4 orders the countries with the greatest negative ATE first. The results reveal that South Korea is the country with the greatest negative ATE at -0.390, followed by Japan with -0.349.

As such, the ordering of the countries in the propensity score analysis results demonstrates a significant variation from the results seen in the first basic analysis. The right-hand column of Table 4 illustrates the countries' correspond-

ing education models, according to Dupriez et al. (2008) and Taki (2010).

A comparison of the previous analysis results in Table 2 and Table 4 revealed that the Czech Republic and Turkey were the countries that least limited students' educational aspirations in the basic analysis and that they maintained a similar position in the propensity score analysis. In other words, even when the independent variables (socioeconomic status, academic ability, sex) used in the logistic regression analysis in

Table 3 were considered, vocational track enrolment was found to be unlikely to reduce educational aspiration, while the ranking of the Netherlands and Hungary both reduced. These results indicate that in countries with branched education systems such as the Netherlands, the formation of educational aspiration is likely to be influenced by socioeconomic status, academic ability, and sex, but unlikely to be influenced independently by vocational track enrolment.

The most important finding for this paper was that Japan and South Korea — the two countries classified by Taki (2010) as adopting examination competition model education systems — were positioned in the top two places. In other words, the vocational tracks in South Korea and Japan have the function of lowering students' educational aspiration to a greater extent than the traditional separation model found in European countries.

Table 4. Average Treatment Effect of Vocational Track Enrolment on Educational Aspiration

	<i>ATE</i>	<i>S.E.</i>		Education System Model
South Korea	-0.390	0.025	***	V
Japan	-0.353	0.025	***	V
Greece	-0.323	0.170	***	
Italy	-0.314	0.013	***	
France	-0.296	0.012	***	II
Austria	-0.252	0.019	***	I
Slovenia	-0.208	0.018	***	
Hungary	-0.204	0.066	***	I
Belgium	-0.169	0.016	***	I
The Netherlands	-0.167	0.007	***	I
Turkey	-0.127	0.017	***	
Switzerland	-0.109	0.018	***	
Czech Republic	-0.100	0.013	***	I

Notes: * $p < .05$ ** $p < .01$ *** $p < .001$; Classifications according to Dupriez et al. and Taki: I) separation model, II) a la carte integration model III) uniform integration model, IV) individualized integration model, V) examination competition model.

5. Conclusions and Implications

This paper identified international trends in vocational track students' aspirations to go on to university through an analysis of PISA 2015 data. The findings from the above analysis can be summarised as follows. There is more likely to be a drag-down effect on educational aspiration from vocational track enrolment in Japan and South Korea, which are classified as having examination competition model education systems, than there is in European countries with separation, à la carte, or integration models.

Branched and two-track education systems institutionally limit students' educational opportunities. That is why, generally speaking, European countries that have adopted class-based education systems are thought to reduce voca-

tional track students' educational aspirations. However, the results of this paper's analysis demonstrate that despite Japan having long adopted a ladder education system, being on the vocational track in Japan has a greater cooling effect on educational aspiration than in European countries.

Breen and Goldthorpe (1997) argue that the 'differences in ability and aspirations of success' can generate educational inequality, while Taki (2010) states that disparities in academic ability in Japan transform into disparities between schools due to high school examinations. This would suggest that the track to which a student is assigned under the examination competition model determines their aspiration of educational achievement to a greater extent than it does in other education systems. Moreover, in so far as Table 2 in this paper and the School Basic Survey are able to confirm, the fact that there is no significant disparity between the figures for aspiring to on to university and the rate of students going on to university arguably demonstrates that Japan's high school disparity structure and its tracking system are successfully and very 'appropriately' cooling students' educational aspiration.

The 'cooling' of high school students' educational aspirations as a result of this tracking system poses a serious problem of educational inequality in comparison to other countries. Yano (2011) organised the characteristics of Japanese universities into the following three aspects: the large number of students enrolled at 18 years of age; the high graduation rate (low dropout rate); and parents' bearing the burden of tuition fees and living expenses during their children's attendance. This is confirmed by various data, including the *Education at a Glance* report (OECD,

2017) and the *Report on school basic survey, culture, sports, science and technology* (MEXT, 2017). The findings of these two reports were summarised at the 2018 meeting of the Central Council for Education Subcommittee on Universities, and the Subcommittee on Future Initiatives. According to the findings, the proportion of students over 25 years of age in Japan enrolled in undergraduate programs was only 2%. Meanwhile, the OECD average is approximately 16.6%, and South Korea is close to the OECD average.⁶⁾ In essence, obtaining a bachelor's degree in Japan is rare unless one enrolls in university immediately after graduating from high school.⁷⁾

In addition, most Japanese university students graduate following the standard enrolment period. As such, the majority of students fall between the ages of 18 and 22 years, with age homogeneity being extremely high. Furthermore, the overwhelming majority of parents cover their children's school-related and living expenses during their university attendance. In other words, whether one will be able to obtain a bachelor's degree in Japan is determined by the willingness of students up to age 18 and their parents' financial means. A culture of life-long learning, of starting work after graduating from high school, and subsequently, furthering one's studies in a bachelor's program has not yet taken firm root in Japan. In addition, even if one wishes to go on to university after the age of 25, parents will rarely cover the costs.⁸⁾ Therefore, the disparity in educational aspirations manifesting during high school tends to be directly linked to the inequality of access to ultimate degree acquisition in Japan.

In this article, I showed the treatment effect of the vocational track, but I would also like to

mention the practical implications of high school education in Japan. In today's high school education system, where the social gap is likely to be widened, it has been argued that there is a need to provide 'nosy support' (*osekkaina shien*) to high school students who are often socially excluded (Sakai, 2007). In addition, teachers engaged in career guidance in such 'nosy support' play the role of supporting career choices based on a student's academic achievements and hopes. The findings in this paper suggest the importance of hands-on intervention for students in the vocational track, which comes in the form of 'nosy support'.

However, the above findings should be interpreted in light of the fact that the students surveyed by PISA are always first-year high school students. Therefore, it must be noted that the paper's findings may only capture the cooling mechanism on educational aspiration from Japan's high school entrance examination selection.⁹ Process is also important in educational activity, and this is why there are often students who begin aspiring to go on to university during their high school careers, even though they are enrolled in the vocational track. In the future, it will be necessary to capture this phenomenon in greater detail through an analysis of follow-up surveys.

Notes

- 1) For applications of tracking theory in European countries, see, for example, the empirical study carried out by Capdevielle-Mougnibas and Courinat-Camps (2016) on France.
- 2) In primary and secondary education systems in Europe, official documents will refer not to 'graduation' but to 'leaving school'. However, the authors have chosen to use the term 'graduation' because the paper advances the discussion based on the

Japanese education system.

- 3) In Japan, for example, Nakanishi (2018) has identified the effects of tracking on Japanese high school students' educational aspiration through a propensity score analysis.
- 4) With reference to Taki (2010), whether the student's country of origin is native should also be controlled. However, the decision was made in this paper's analysis to exclude the variable entered into the regression model relating to whether the student's country of origin was native from the analysis because a strong multicollinearity was found with socioeconomic status.
- 5) In terms of the chronological order of the survey, the correct description is that 'students on the vocational track are likely to have lower math scores'. However, at the very least, it can be argued that allocated track and math scores are covariant.
- 6) The difference between Japan and South Korea may be due to the presence or absence of the requirement for military service.
- 7) According to the School Basic Survey, approximately 20% of students delay their university enrolment for 1–2 years in order to enter the university or faculty of their choice.
- 8) However, since April 2020, Japan has started a new benefit-type scholarship system, which has not only expanded the households covered but also reduced and exempted tuition fees. Through the introduction of such scholarship systems, the paradigm that parents must bear the costs of higher education may change.
- 9) Nakanishi (2018) demonstrates the tracking effect on changes in Japanese students' educational aspiration using panel data before and after high school enrolment.

References

- Bourdieu Pierre and Passeron, Jean Claude. 1977. *Reproduction in education, society and culture*. Nice R (trans). London: Sage Publications.
- Breen Richard and John H. Goldthorpe. 1997. Explain-

- ing educational differentials: Towards a formal rational theory. *Rationality and Society* 9(3): 275-305.
- Capdevielle-Mougnibas Valérie and Amélie Courtinat-Camps. 2016. Forms of School Experience in France's Vocational Training Track Students. *European Journal of Psychology of Education* 32(1): 21-38.
- Dupriez, Vincent, Xavier Dumay and Anne Vause. 2008. How Do School Systems Manage Pupils' Heterogeneity? *Comparative Educational Review* 52(2): 245-273.
- Fujihara Sho. 2015. Shingaku-ritsu no Jōshō wa Shinro Kibō no Shakai Keizai-teki Kakusa wo Shukushō Sasetanoka: 2002-nen to 2012-nen no Hikaku Bunseki [Did the Rise in Enrollment Rate Reduce the Socio-economic Disparity in Career Choice? A Comparative Analysis Between 2002 and 2012]. In: Wataru Nakazawa and Fujihara Sho (eds) *Kakusa Shakai no Naka no Kōkōsei — Kazoku Gakkō Shinro Sentaku [High School Students in a Disparity Society-Family, School, Career Choice]*. Tokyo: Keisōshobō, pp.21-36.
- Fujita Hidenori. 1980. Shinro Sentaku no Mekanizumu [The Mechanism of Youth's Path Selection]. In: Ikuo Amano and Yamamura Takeshi (eds) *Seinen-ki no Shinro Sentaku [Youth's Career Choice]*. Tokyo: Yuhikaku, pp.105-129.
- Grubb W. Norton and Marvin Lazerson. 2009. *The Education Gospel: The Economic Power of Schooling*. Cambridge, Massachusetts: Harvard University Press.
- Halsey A.H.. 2006. The European University. In: Lauder H, Brown P, Dillabough J and Halsey A.H. (eds) *Education, Globalization, & Social Change*. Oxford: Oxford University Press, pp.854-865.
- Hida Daijiro, Mizuka Hiroaki, Kariya Takehiko and Iwaki Hideo (eds). 2000. *Kōkōsei Bunka to Shinro Keisei no Henyō [The Change of High School Students' Subculture and Career Choice]*. Tokyo: Gakujishuppan.
- Hoshino Takahiro. 2009. *Chōsa Kansatsu Dēta no Tōkei Kagaku: Inga Suiron Sentaku Baiasu Dēta Yūgō [Statistical Science of Survey Observation Data-Causal Inference, Selection Bias, Data Fusion]*. Tokyo: Iwanami-Shoten.
- Hoshino Takahiro and Okada Kensuke. 2006. Keikō Sukoa wo Mochiita Kyōhenryō Chōsei niyoru Inga Kōka no Suitei to Rinshō Igaku Ekigaku Yakugaku Kōshū Eisei Bun'ya de no Ouyō ni tsuite [Estimation of Causal Effect Using Propensity Score Methods in Clinical Medicine, Epidemiology, Pharmacoepidemiology and Public Health: a Review]. *Journal of the National Institute of Public Health* 55(3): 230-243.
- Iwaki Hideo and Mimizuka Hiroaki. 1983. *Gendai no Esupuri: Kōkōsei: Gakkō Kakusa no naka de [Modern Esprit: High School Students: In School Gap]*. Tokyo: Shibundo.
- Kariya Takehiko. 1986. Tozasareta Shōrai-zō: Kyōiku Senbatsu no Kashi-sei to Chūgakusei no "Jiko Senbatsu" [Closed Future Image: Visibility of Educational Selection and Junior High School Students' Self-selection]. *The Journal of Educational Sociology* 41: 95-109.
- Kyomen Tetsuo. 2016. Futsū Kyōiku niokeru "Rōdō Shokugyō" no Ichidzuke no Henyō: Furansu niokeru Shinro Shidō no Tenkai Katei o Jirei to Shite [The Changing Status of "Labor/Vocation" in General Education: A Case Study on the Development of Career Guidance in France]. *The Japanese Journal of Educational Research* 83(2): 194-206.
- Mimizuka Hiroaki. 2000. Shinro Sentaku no Kōzō to Henyō [The Structure of High School Students' Career Choice and its Change]. In: Hida Daijiro, Mimizuka Hiroaki, Kariya Takehiko and Iwaki Hideo (eds), *Kōkōsei Bunka to Shinro Keisei no Henyō [The Change of High School Students' Subculture and Career Choice]*. Tokyo: Gakujishuppan, pp.194-206.
- Ministry of Education, Culture, Sports, Science and Technology (MEXT). 2015. *Report on School Basic Survey, Culture, Sports, Science and Technology 2009*. Tokyo: MEXT.
- Ministry of Education, Culture, Sports, Science and Technology (MEXT). 2017. *Report on School Basic*

- Survey, Culture, Sports, Science and Technology 2009*. Tokyo: MEXT.
- Nakanishi Hiroki. 2018. Tracking ga Kōkōsei no Kyōiku Kitai ni Oyobosu Eikyō: Paneru Dēta wo Mochiita Keikō Score Matching niyoru Kenshō [The Effect of Tracking on the Educational Expectations of High School Students: Testing by Propensity Score Matching with Panel Data]. *Soshioroji* 191: 41–59.
- Oakes Jeannie. 1985. *Keeping Track: How Schools Structure Inequality*. New Haven, Connecticut: Yale University Press.
- OECD. 2017. *Education at a Glance 2017*. Paris: OECD Publishing.
- Rosenbaum James (1976) *Making Inequality: The Hidden Curriculum of High School Tracking*. New York: Wiley-Interscience.
- Sakai Akira (ed). 2007. *Shingaku Shien no Kyōiku Rinshō Shakai-gaku: Shōgyō Kōkō niokeru Akushon-risāchi [Educational Clinical Sociology for Supporting Enrollment: Action Research in Commercial High Schools]*. Tokyo: Keiso-shobo.
- Sonoyama Daisuke (ed). 2018. *Furansu no Shakai Kaisō to Shinro Sentaku: Gakkō Seido kara no Haijo to Jiko-senbatsu no Mekanizumu [French Social Stratification and Career Choice: The Exclusion from the School System and the Mechanism of Self-Selection]*. Tokyo: Keiso-shobo.
- Sudo Kosuke. 2010. Gakushū Hōryaku ga PISA-gata Gakuryoku ni Ataeru Eikyō: Kaisō niyoru Hōryaku no Chigai ni Chakumoku shite [Influence of Learning Strategy on PISA Achievement: From the Viewpoint of Strategy Differences between Social Classes]. *The Journal of Educational Sociology* 86: 139–158.
- Takeuchi Yo. 1995. *Nihon no Meritocracy: Kozo to Shinsei [Japanese meritocracy: Structure and mentality]*. Tokyo: Tokyo Daigaku Shuppan.
- Taki Hirofumi. 2010. Shakai Keizai-teki Chii to Gakuryoku no Kokusai Hikaku: Kōki Chūtō Kyōiku Dankai niokeru Kyōiku to Fubyōdō no Nipponteki Tokuchō [The Relationship Between Socio-economic Status and Academic Achievement: Exploring Specific Characteristics of Education and Inequality in Japan]. *Sociological Theory and Methods* 25(2): 229–248.
- Taki Hirofumi. 2011. Nichi, Doku, Bei niokeru Gakkō Torakku to Shingaku Kitai Shokugyō Kitai: Gakkō to Shokugyō no Setsuzoku ni Chakumoku shite [School Track and Expectations under Different School-to-Work Linkage: An International Comparison Between Japan, Germany, and the United States]. *Japanese Sociological Review* 62(2): 136–152.
- UNESCO Institute for Statistics. 2012. *International Standard Classification of Education: ISCED 2011*. Montreal, Quebec: UNESCO Institute for Statistics.
- Urabe Masashi. 2012. Doitsu niokeru Chūtō Kyōiku Seido Kaikaku Dōkō nikansuru Ichikōsatsu [How is the Secondary School System Reformed in Germany?]. *The Review of Tokuyama University* 74: 69–79.
- Willis Paul. 1977. *Learning to Labor: How Working Class Kids Get Working Class Jobs*. Westmead: Saxon House.
- Yano Masakazu. 2011. Nihon no Shinjin: Nihonteki Kazoku to Nihonteki Koyō no Junkyōsha [Japanese Freshman: Martyrs of Japanese Family and Japanese Employment]. *The Monthly Journal of the Japan Institute of Labour* 606: 51–61.