DE GRUYTER
DOI 10.1515/cj-2014-0004 — Contemporary Japan 2014; 26(1): 71–102

Steve R. Entrich

Effects of investments in out-of-school education in Germany and Japan

Abstract: The aim of this paper is to clarify in what ways school performance and out-of-school lessons are linked, with special emphasis on social disparities in educational attainment. Previous research about shadow education indicates that out-of-school education may indeed be a factor to improve the academic achievement of school students. On the other hand, it is stated nearly without exception that the socioeconomic background of a student plays a significant role for academic achievement as well. Using data of the 2009 Programme for International Student Assessment (PISA), this paper shows new findings in comparing effects of shadow education investments on students' performance in Japan and Germany. I found that out-of-school education investments in both countries led to four significant outcomes: (i) in Japan, high school students' academic achievement is increased due to out-of-school lessons; (ii) in both countries there is great variation in how out-of-school lessons affect academic performance according to the types of out-of-school lessons and the living area; (iii) out-of-school education determines higher achievement scores in international comparison in a decisive way and therefore provides a reasonable explanation for the Japanese success in PISA; and (iv) since the mid-1990s the system in Japan has advanced from a mixed to a predominantly enrichment out-of-school education system, while the German out-of-school education system is still of remedial character.

Keywords: out-of-school lessons, shadow education, academic achievement, socioeconomic background, PISA, Japan, Germany

Steve R. Entrich: University of Potsdam, e-mail: entrich@uni-potsdam.de

1 Introduction

The strong influence of the socioeconomic background of a student on his or her educational attainment has long been known and aptly characterized as "persistent" (Shavit and Blossfeld 1993). This persistence of educational inequality in modern societies was also attested by the OECD (Organisation for Economic Co-operation and Development). The international comparison of 15-

year-old students' academic performance in the first Programme for International Student Assessment (PISA) of the year 2000 led to an increasing research activity within the field of educational inequalities, especially in Germany (Geißler and Weber-Menges 2010: 155–156). With PISA, the OECD first certified that German students scored at best in the "middle field" of performance in international comparison,[1] and second, showed that the correlation between students' social origin and their academic achievement was the strongest amid the OECD participants in PISA 2000 (Stanat et al. 2002: 12). The obvious linkage between academic achievement and educational attainment made clear how far-reaching the PISA results were (Ojima and von Below 2010: 275). Consequently, PISA brought back the problem of educational inequality not just into German research but to the German public as well (Geißler 2010: 40).

In contrast, students in Japan scored very high in PISA 2000 while no strong correlation of social background and academic achievement (performance scores) could be detected. In general, countries with a higher percentage of students with an advantaged socioeconomic background performed better in PISA 2009, too. Japan, however, is one of the countries with a mean index of socioeconomic background that is very close to the OECD average (OECD 2010a: 31). For PISA 2009, only about 8.6 % of the variance in student performance in Japan is explained through the economic, social, and cultural status (ESCS) of a student, whereas in Germany the ESCS explains 17.9 % of the variance in performance (OECD average: 14 %), although the slope of the socioeconomic gradient in both countries does not differ that much (Japan: 40; Germany: 44) (OECD 2012a: 47–49). These results indicate that the Japanese were able to establish an education system with a more equal distribution of educational opportunities for students of different social origin (OECD 2010a: 30).

However, similarities between the two countries were also found. Like in Germany, there is great variation of students' performance between schools in Japan, which has even increased over the last decade (OECD 2012a: 47), but low variation within schools. Furthermore, the variance in students' performance in PISA is very large in both countries (Ojima and von Below 2010: 275).

Taking into account research findings about inequity in the distribution of educational opportunities, income inequality is not the main reason for academic inequality (OECD 2010a: 31). In international comparison, it can be shown that differences in educational opportunities are more closely associated with the national characteristics of education systems (Marks 2005). Thus, influential characteristic differences between countries' educational outcomes

1 No significant difference in the performance score's standard deviation compared to OECD average.

are found in the school system and outside of school. To understand the continuous high scoring of Japanese students in international comparisons, out-of-school education has to be acknowledged, too (Schümer 1999). In Japan, the educational life course of a student is often strongly affected by *gakkōgai kyōiku* – education outside of school (e.g., Konakayama and Matsui 2008), in the last two decades often referred to as "shadow education" (e.g., Baker et al. 2001; Bray 1999, 2006, 2010; Dierkes 2010; Stevenson and Baker 1992).

Shadow education is an international phenomenon that is especially popular at the transition points in school life course. Particularly in Japan, taking out-of-school classes has a long tradition. These supplementary lessons are mostly used to prepare for entrance examinations at the transition from one school to the next (Bray 2006: 515–516). With the expansion of worldwide shadow education, research about out-of-school education steadily increased (Bray 2010, 2011; Bray and Lykins 2012; Bray et al. 2013). Due to growing concerns regarding social and educational inequalities in relation to students' out-of-school educational activities, for the last decade an increased research activity can be observed also for Japan (e.g., Benesse 2006, 2010; Hamajima and Takeuchi 2002; Kataoka 2001; Kita 2006; Konakayama and Matsui 2008; MEXT 2008; Mimizuka 2007; Mori 2008; Tomura et al. 2011; Okada 2012; Tobishima 2012a, 2012b) and Germany (e.g., Dohmen et al. 2008; Haag and Jäger 2011; Jäger-Flor and Jäger 2009; Jürgens and Dieckmann 2007; Klemm and Klemm 2010; Schneider 2006). Nevertheless, research about the effects of shadow education on academic achievement in Germany and Japan so far has not included analyses on a national representative level or in international comparison.

To understand the linkage between shadow education and academic achievement in regard to social inequality, this paper uses the national representative PISA 2009 data to examine the determinants of academic achievement (performance scores in reading, mathematics, and science literacy) of 15-year-old Japanese in comparison to German high school students of the same age.

2 Theoretical framework: shadow education in Germany and Japan

According to social scientific theories about educational inequality, social inequalities in educational opportunities are reproduced through the education system of a country. In addition, parents' decisions about the educational trajectory of their child are based on their socioeconomic resources. Parents evalu-

ate the costs of education in relation to the estimated returns to education (Becker and Lauterbach 2010: 15–17). Since out-of-school lessons and out-of-school learning time generally show positive significant effects on academic achievement (e.g., Baker et al. 2001; Guill and Bonsen 2011; Hosenfeld 2011; Jäger-Flor and Jäger 2009; Kariya and Shimizu 2004; Kariya 2013b; Konakayama and Matsui 2008; Mimizuka 2007; Tomura et al. 2011), an investment in shadow education must seem reasonable from the parents' view. But, taking into account the classic work of Boudon (1974), primary as well as secondary effects of social origin can be identified as influential factors for the educational pathways of students. For students with an advantaged family background, better academic performance can be achieved than for those students with a disadvantaged background (primary effect). Thus, disadvantaged students are in need of supplementary education but short of the financial resources. According to the secondary effect of social origin, parents' decision for the further educational life course of their children is also highly influenced by their own social background. Especially at educational transition points in the life of a child, the influence of parents' social background on the decision-making process often leads to social reproduction (Becker and Lauterbach 2010: 15–17; Maaz 2006: 50–52). Therefore it seems "reasonable to assume that prosperous families are in a position to invest in forms of tutoring which significantly promote their children's performance in the school system" (Bray 2006: 523). The consequences of the worldwide expansion of shadow education in recent years can either be problematic, if seen in terms of increasing social inequalities or pressure on children, or beneficial, as a contribution to the education market as a whole (Bray 2010: 11), leading to an increase in human capital (Dang and Rogers 2008). Before formulating testable hypotheses, the shadow education systems of Japan and Germany will be shortly introduced.

2.1 Japan

In Japan, shadow education is mostly found at private institutions, e.g., the academic *juku* (*gakushūjuku*) often referred to as cram school (e.g., Roesgaard 2006). A *juku* is a private for-profit school offering tutoring, enrichment as well as remedial classes (*hoshūjuku*), or the preparation for tests and (entrance) exams (*jukenjuku* or *shingakujuku*) (Dierkes 2010: 26–27). Taking classes at *juku* has become very popular among students ever since the great *juku* boom in the 1970s (Rohlen 1980). The establishment and steady expansion of the Japanese *juku* industry was an answer to the extraordinary high increase of educational aspirations of the Japanese population in the course of educational expansion

(Dierkes 2010: 26; Haasch 2000: 195). Instead of the Japanese government, which did not meet the educational needs of worried parents, private operators started offering educational support (Drinck 2002: 263; Haasch 1979: 43–46). Usage ratios of *juku* vary according to grade and area. In 2009, approximately 40.7 % of primary school students in large cities were enrolled at a *juku*, but only 12.6 % in rural areas. Comparable differences were found for middle (urban: 53.8 %; rural: 44.2 %), but not for high school students (urban: 20.8 %; rural: 19.5 %) (Benesse 2010: 99). Besides the *juku* classes, lessons given by private home tutors and correspondence courses are the most popular types of shadow education (MEXT 2008).

Japan has a single-track comprehensive school system inspired by the United States model. Japanese students stay at primary school (*shōgakkō*) for six years before they decide on a middle school (*chūgakkō*). After three years at middle school basically every student (97.6 %) goes on to high school (*kōtō gakkō*) for another three years, although high school is not compulsory (MEXT 2006). By attending a high school regardless of its designation as vocational (*senmon gakka*) or academic course (*futsūka*), every student has the opportunity to access higher education. But, as Stevenson and Baker already argued back in 1992, the Japanese school system is also highly stratified, especially at the high school level. Here schools are ranked according to the percentage of students that make it into high-ranked universities by passing the difficult entrance examinations (*nyūgaku shiken*) (Ojima and von Below 2010: 277; Stevenson and Baker 1992: 1641). These entrance examinations are "central to the allocation process" (Stevenson and Baker 1992: 1640), as they are few in number and therefore decisive for the educational career of a student. On the other hand, these examinations are meritocratic in nature and promise high returns to education if a student succeeds. Stevenson and Baker (1992: 1641) called this "contested sponsorship."

Since the mid-1990s researchers proclaimed that the low fertility rate would put an end to the so-called examination hell (*shiken jigoku*) until 2009, meaning that the tough competition for university entrance would just stop due to fewer competitors. But this was not the case (Okada 2012: 145). Instead, a steady increasing percentage of students aim to get into university nowadays, again enhancing competition (Kariya 2013a). As a result of this development, the already existing run on the *juku* has increased, too (Okada 2012: 145). Today most Japanese students have *juku* experience (Konakayama and Matsui 2008: 131). It is commonly perceived that without the *juku* industry the Japanese formal school system can no longer properly prepare students for their later life course (Sato 2005).

Among researchers as well as the Japanese public there is a strong belief that the investment in shadow education leads to a higher educational level by taking advantage of the socioeconomic status (SES) of a student, consequently fostering educational inequality. Ever since the great *juku* boom in the 1970s it has been assumed that especially families with a higher SES use shadow education to increase the academic achievement of their children. This implies a causal connection between SES, amount of investments in shadow education, and students' academic achievement (Konakayama and Matsui 2008: 132; Seiyama and Noguchi 1984: 113–114). According to recent research, parents' SES clearly influences their children's academic achievement (e.g., Kataoka 2001; Mimizuka 2007; Tomura et al. 2011; Yamamoto and Brinton 2010).[2] Additionally, out-of-school learning time generally has positive effects on academic achievement (e.g., Kariya and Shimizu 2004; Kariya 2013b). For shadow education, varying effects on students' academic achievement are found with respect to gender (e.g., Seiyama and Noguchi 1984), age (e.g., Konakayama and Matsui 2008; Seiyama 1981), educational aspirations (e.g., Hamajima and Takeuchi 2002), and, following cultural capital theories by Bourdieu (1983), cultural background (e.g., Kataoka 2001; Konakayama and Matsui 2008; Yamamoto and Brinton 2010). Moreover, previous research showed that the location of a school has effects on whether or not students participate in shadow education since there is less supply in rural areas (Stevenson and Baker 1992: 1647). In addition, Mimizuka (2007) found varying effects of different forms of shadow education and out-of-school learning time on academic achievement in large cities and less populated urban areas. While learning time at home showed positive significant effects for 6th grade students' mathematics achievement in large cities (increase of 9 points per 100 minutes) and less populated areas (increase of 5 points per 100 minutes); attendance of *jukenjuku* (increase of 16 points) and *hoshūjuku* (increase of 3 points) showed only positive significant effects on achievement in large city areas (Mimizuka 2007: 26). Since the used data are limited to surveys in metropolitan areas and surrounding cities and a clear statement about the degree of influence of family background on academic achievement in more rural areas could not be made, Mimizuka (2007) has pleaded for the expansion of research with special regard to regional context.

2 Solely Seiyama and Noguchi (1984) found differences between male and female middle school students in how the SES of their parents affected shadow education investments at a *juku*. A positive correlation between *juku* attendance in 8th grade and SES was only found for male students.

2.2 Germany

While the continuously increasing investment in shadow education in East Asia is well known, shadow education is expanding in Western countries as well (Bray 2006: 515). In Germany, a strong increase in the investment in shadow education has taken place since the 1990s (Guill and Bonsen 2011: 307; Mayr 2010: 10–11). According to the representative *Shell-Jugendstudie* ('Shell youth study') there has been an increase of about 5 % for 12–21 year olds in Germany over four years (2002: 18 %; 2006: 23 %) (Langness et al. 2006). The German shadow education system thus became an influential factor educationally as well as economically. Various conservative estimates suggest that around 1.1 million German students yearly use shadow education, called *Nachhilfe* in German. This industry already has a profit of nearly 1.5 billion euros (approximately $ 1.96 billion) per year (Klemm and Klemm 2010: 20). Still, compared to the Japanese *juku* industry that generates about $ 12 billion a year (Dawson 2010: 16), the institutionalized German *Nachhilfe* system with its estimated more than 4,000 *Nachhilfe* schools (Japan: almost 50,000 *juku*; Benesse 2007: 2) is in an early stage of development. Only about 30 % of all shadow education in Germany takes place at these institutions (Dohmen et al. 2008: 53).

A considerable increase in the use of out-of-school lessons goes hand in hand with the transition from primary to secondary school in Germany (Guill and Bonsen 2011: 307). Students in most federal states go to primary school (*Grundschule*) until they finish 4th grade.[3] After that they have to decide which one of the three secondary school tracks to attend: *Gymnasium, Realschule,* or *Hauptschule*. This tripartite system is a very influential institutional factor that leads to different learning outcomes through early selection. It is intended that children should be placed into different school types according to their performance. However, in reality it is the social background of a German student that highly determines the type of secondary school he or she will attend, thus contributing to social reproduction (Ditton 2010: 55; Geißler 2006: 273–274). The *Gymnasium* traditionally provides the opportunity to get admission to university through *Abitur*.[4] *Realschule* graduates have access to white collar jobs and other higher education fields. In contrast, students graduating from *Hauptschule* have only very limited opportunities to higher education and well-paid or prestigious jobs (Ojima and von Below 2010: 277). Apart from these three

3 Exceptions are the federal states Berlin and Brandenburg, which have a six-year primary school system (Entrich 2008: 22).

4 The German *Abitur* is the only diploma that authorizes students to access universities and academic colleges.

main types of schools, an increasing number of comprehensive secondary schools, the *Gesamtschule*, also provide the opportunity to get an *Abitur* and concommitant access to university. Nevertheless, this school type is not yet a competitor for the tripartite system (Maaz 2006: 85).

Private tutoring programs have not been very popular in Germany until recently. The increased investment in *Nachhilfe* is seen as a problem and an indicator for the failure of the compulsory school system. In fact, it is feared that the high costs for private lessons will intensify educational as well as social disparities, as some studies indicate (Schneider 2006). Schlösser and Schuhen (2011: 373) also speak of a change of motivations for the attendance of *Nachhilfe* lessons over the last decade, since remedial purposes no longer seem to be prevalent. On the other hand, Jäger-Flor and Jäger (2009) found that out-of-school education can also function as a social compensatory factor. Likewise, Guill and Bonsen (2011) in a study in the German city Hamburg detected positive significant effects of shadow education on students' learning outcome and showed that students with a lower family income attend more out-of-school classes than the more socially advantaged students.

In general, most studies in Germany are limited to single cities or *Nachhilfe* companies and therefore provide us with different results. In most cases changes in school grades were researched, showing predominantly positive effects of shadow education on school grades in different subjects (e.g., Haag 2001; 2007; Hosenfeld 2011; Streber et al. 2011). In addition, in a nationwide analysis, Schneider (2006) found that students living in former West Germany use more shadow education, although the participation ratio is not showing significant differences in urban and rural areas. However, because of the limitations of the data used, no statements about the effect on academic achievement could be made. Until now, it is not clear if out-of-school lessons in Germany contribute to students' performance on a national level in international comparison.

2.3 Research hypotheses

Based on the country-specific backgrounds as outlined above, this section presents the three main research hypotheses that motivate the analysis. Firstly, the differences in the participation ratios in shadow education in Germany and Japan lead to the assumption that shadow education as an opportunity to increase performance is contributing to the scoring differences in international comparison. Assuming shadow education has this positive effect on the performance of students, my first research hypothesis reads as follows:

[H1] Shadow education is a decisive determinant for higher achievement scores in international comparison and therefore a reasonable explanation for the Japanese success in PISA as compared to Germany.

In addition, we have to consider the possibility of cross-national variation in shadow education for the two countries. Using TIMSS 1995 data, Baker et al. (2001) compared 41 countries in terms of shadow education and defined three different types of shadow education systems, characterizing them as mostly remedial in purpose (i.e., negative statistically significant effect on achievement score due to shadow education), mostly of enrichment nature (i.e., positive statistically significant effect), or a mixed form of both (i.e., statistically non-significant, or very small coefficients). While the German shadow education system was assessed to be strictly remedial in its purpose, the Japanese equivalent was found to be a mixed system (Baker et al. 2001: 8). Taking into account the developments within the sector of shadow education in both countries since the 1990s, it is unlikely that we will find the same results Baker et al. (2001) did. Thus, it seems reasonable to formulate my second research hypothesis:

[H2] Although the out-of-school education systems of Japan and Germany are still different, both systems have advanced from simply remedial to mixed (Germany) or rather mixed to enrichment (Japan) systems.

Furthermore, are there differences in how much the participation in non-regular classes affects academic achievement according to different types of out-of-school education and the region a student lives in? Following Mimizuka (2007), it is assumed that Japanese students living in large cities have greater educational opportunities due to a higher availability and diversity of shadow education. As a consequence, shadow education should generally show stronger effects on academic performance in urban than in rural areas. Therefore, the influence of social background should be less pronounced in the city than at the countryside. Although Schneider (2006) found no regional variation for German students, better educational opportunities in urban areas are assumed for Germany as well, because of a greater variety of shadow education providers in cities. In addition, the different types of shadow education (enrichment or remedial in general) are supposed to show different effects on the increase of performance. Thus, my last research hypothesis [H3] reads as follows:

[H3] The effect of out-of-school education on academic achievement varies according to the used type of shadow education and the area a student lives in. With a higher possibility to bridge achievement gaps in urban

areas due to out-of-school education, students are able to neutralize disadvantages in the educational attainment process.

3 Determinants for academic achievement in Germany and Japan: PISA 2009

In this section, I analyze PISA 2009 data with the aim to test my three research hypotheses. With special focus on regional differences it shall be clarified how strong the influence of students' SES and their participation in out-of-school lessons are on educational outcomes (performance scores). First, the dependent variable concerning performance will be explained. In a next step, a closer look will be given to the explanatory variables family background, out-of-school lessons, and a couple of others. At the end, students' performances in all three test fields of PISA (reading, mathematics, and science) are predicted using the statistical method of linear regression modeling.

In advance of the analysis, the PISA data need to be briefly explained. The PISA survey was first carried out in 2000 and has been reconducted every three years since then. I will use the most current data of the fourth PISA survey, conducted in 2009 in 65 countries. The main concern of the study was to measure the actual education level of 15-year-old students at the end of compulsory schooling in international comparison. To achieve this goal, three performance fields were chosen: reading (READ), mathematical (MATH) and scientific (SCIENCE) literacy. Each of the past four surveys laid greater emphasis on one of the three performance fields, reading in 2000, mathematics in 2003, and science in 2006. In 2009 the main focus of the study was back to reading ability (OECD 2012b: 22–23).

For PISA a two-stage random sampling was used for each participating country. After a sample of schools was selected from an overall list of schools with the student population of interest, a simple random sample of students could be drawn from within the selected schools. On average, of each school 35 students at age 15 were selected randomly to participate in PISA (OECD 2009: 51). For our calculations all data were weighted to get unbiased estimates of population parameters.

3.1 Student performance in PISA: differences between Japan and Germany

Students' academic achievement in PISA was measured as actual literacy skills in a forward-looking perspective. Instead of focusing "on the extent to which

these students have mastered a specific school curriculum, [PISA] looks at their ability to use their knowledge and skills to meet real-life challenges" (OECD 2012b: 22). This is done using plausible values for calculation instead of test scores per se. These plausible values are "random numbers drawn from the distribution of scores that could be reasonably assigned to each individual [and are] better suited to describing the performance of the [student] population" (OECD 2012b: 142). Therefore the scores in Figure 1 have to be understood as average mean of the literacy skills of each country's student population in the three performance fields: reading, mathematics, and science.

Because these scores are not always directly comparable between the different dates of data collection from 2000 to 2009, the figure includes the ranking of German and Japanese students in PISA as well. As can be seen, Japan's students in all four surveys achieved significantly higher results in each of the three performance fields. In PISA 2000, Japanese students showed a mean performance of 557 points in mathematics, rank 1 in international comparison, 550 points in science (rank 2), and 522 points in reading (rank 8). Results in 2009 were nearly as good (ranks 4, 2, and 5, respectively).

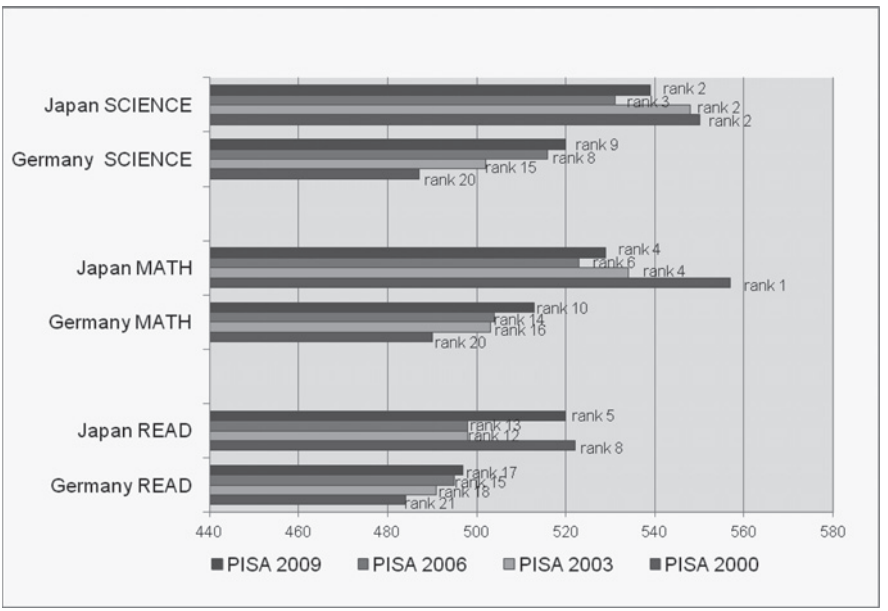

Figure 1: PISA 2000 to 2009 "Positioning of Germany and Japan within the different competency fields (test scores and ranking)." *Source:* PISA 2000/2003/2006/2009, own calculation; including only the PISA 2000 participants.

German students, on the other hand, did not achieve comparable results. With rank 20 in mathematics and science as well as rank 21 in reading, Germany barely made it to the lower middle field in international comparison. Although German students achieved better scores in each survey (2009: rank 10 in MATH; rank 9 in SCIENCE; rank 17 in READ), leading to a decrease in score difference between Japan and Germany, it is not quite clear if the various educational reform measures after the German "PISA shock" alone can account for this development (Entrich 2008: 20–23; Breakspear 2012: 5). We also have to ask how important increased investments in shadow education are for this development.

3.2 Economic, social, and cultural status (ESCS)

Besides students' performance, the PISA staff collected a great variety of valuable data regarding the social environment of the participating children. Of special importance is the data about the family background of the respondents and its influence on performance. Since 2003, the family background of each child is represented by the index of the economic, social, and cultural status (ESCS). This index is derived from three significant variables: the highest parental education in years (PARED), the highest parental occupation (HISEI), as well as the number of home possessions (HOMEPOS). Although socioeconomic status (SES) is normally based on income, occupational status, and education, PISA includes no income data. Here the variable HOMEPOS was used as an approximate measure of family wealth. This index also takes into account cultural matters of family background, whose importance has already been pointed out by Bourdieu (1983) in his classic work and was found to have effects on academic achievement (Kataoka 2001; Yamamoto and Brinton 2010).[5]

Although in PISA 2000 the lowest performance score range in reading literacy was found in Japan (27 points) and the highest in Germany (111 points) (Stanat et al. 2002: 12), the more accurate data from 2003 onwards have shown greater diversity for Japan, too. However, differences in the performance score range between advantaged and disadvantaged students in the two countries still remained in 2009 (see Figure 2). The average performance score ranges between lower and upper class in Germany exceed the same ranges in Japan by a minimum of 17 points (READ) to a maximum of 35 points (SCIENCE).

5 Analyses including cultural aspects of family background in addition to SES showed either no effect of shadow education on academic achievement (Yamamoto and Brinton 2010) or only positive effects for male students (Kataoka 2001).

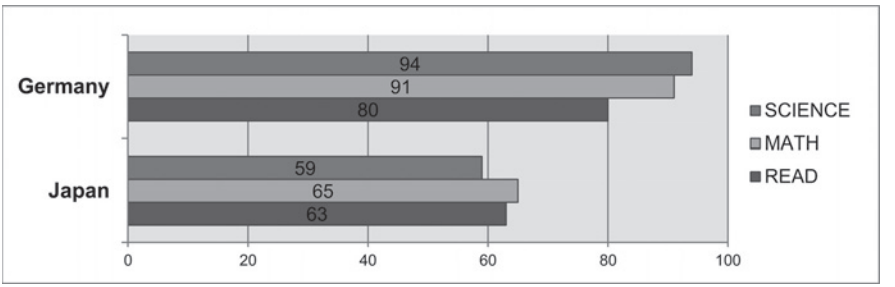

Figure 2: PISA 2009 "Range between the average performance of German and Japanese 15-year-olds from highest and lowest quartile of society." The figure above shows the differences between the means of the performance of those 25 % of students from families with the highest social status of each country compared to the performance of those 25 % of students from families with the lowest social status. *Source:* PISA 2009, own calculation.

3.3 Education outside of school

Shadow education is defined as "a set of educational activities that occur outside formal schooling and are designed to enhance the student's formal school career" (Stevenson and Baker 1992: 1639). This means all non-professional forms, such as parental help with homework, and non-academic forms of out-of-school education, like arts or sports lessons (*naraigoto*), are excluded from this definition. So far, PISA 2009 data fit the purpose of this analysis, since I only consider out-of-school lessons related to the three fields of PISA performance: in native language, mathematics, and science. However, shadow education is also supposed to "improve student's chances of successfully moving through the allocation process [while it is] firmly rooted within the private sector" (Stevenson and Baker 1992: 1640–1641). Here certain limitations of PISA data have to be mentioned. It is not clear whether out-of-school lessons as mentioned in the questionnaire are attended in the private or public sector, nor whether or not they have to be paid for. These lessons were simply defined as "given at [...] school, at [...] home or somewhere else" (questions 31 and 32, OECD 2008: 19). In Japan, about 19.4 % of high school students attend out-of-school lessons provided by the for-profit *juku* industry (Benesse 2010: 99). Consequently, the Japanese translation of "somewhere else" in the respective questions is "*juku nado*" ('*juku*, etc.') (question 27, OECD 2010b: 327), indicating that lessons (*jugyô*) are attended predominantly in three areas: school, home, and *juku*. While paid lessons at home (correspondence courses, private tutor) or at a *juku* are considered as shadow education, unpaid lessons at school and

at home are not. The same goes for Germany, where "somewhere else" mostly refers to *Nachhilfe* schools or the homes of private tutors.

In PISA, three dummy variables (Yes/No) about the use of different types of out-of-school lessons were classified: enrichment lessons, remedial lessons, as well as lessons to improve one's study skills. While enrichment lessons are supposed to enhance students' academic achievement above their current classes' average level, remedial lessons are traditionally attended if a student has problems to catch up with his classmates or learning problems of any kind. Lessons to improve study skills mean lessons that help students acquire strategies and methods on how to learn in an effective and sustainable way. However, since the PISA questionnaires had to be translated into Japanese and German, the available data have certain limitations. German translations were very specific and relatively faithful to the English original. For the Japanese questionnaire, however, a very uncommon term was used to refer to enrichment lessons: *hatten jugyō*, 'development lessons' (OECD 2010b: 327). *Hatten jugyō* is mostly understood as lessons that help develop the educational level in a remedial way. Remedial lessons themselves were given in Japanese as *hoshū jugyō*, 'supplementary lessons' (2010b: 327). This term includes different types of out-of-school lessons, which are also mostly characterized as remedial. Consequently, Japanese students must have been confused where exactly to put their mark, since *hatten jugyō* and *hoshū jugyō* were both understood as out-of-school lessons without clear enrichment character. Another rather problematic translation was *gakuryoku o kōjō saseru tame no benkyō* ('studies to increase academic achievement') for skill-improving lessons (2010b: 327). This term is prone to be understood as referring to some sort of enrichment lessons, although *benkyō* 'studies' was used here instead of *jugyō* 'lessons'. Nevertheless, this last point should not be problematic, as all other subquestions of this questionnaire item are referring to *jugyō*. Respondents thus could easily understand that *benkyō* here does not include self-study.

In summary, we will have to abandon skill-improving lessons for the German case, since there are no equivalent data for Japan, and also categorize *hatten jugyō* as remedial lessons, since it is not suited to be understood as enrichment lessons. Instead, I will use *gakuryoku o kōjō saseru tame no benkyō* as variable for enrichment lessons in Japan. Figure 3 shows the attendance ratios for Japanese and German students.

Here the biggest difference between students in the two countries is revealed: Japanese 15-year-old students attend significantly more lessons outside regular school than German students of the same age. Especially enrichment lessons in Japan are attended to a high degree (46.6 %), indicating there are also students attending unpaid lessons at school or at home. In Germany

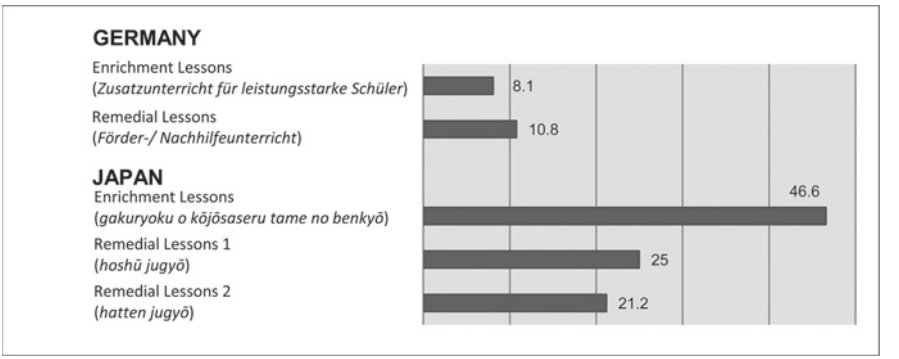

Figure 3: PISA 2009 "Out-of-school lessons in Germany and Japan" (in %). *Source:* PISA 2009, own calculation.

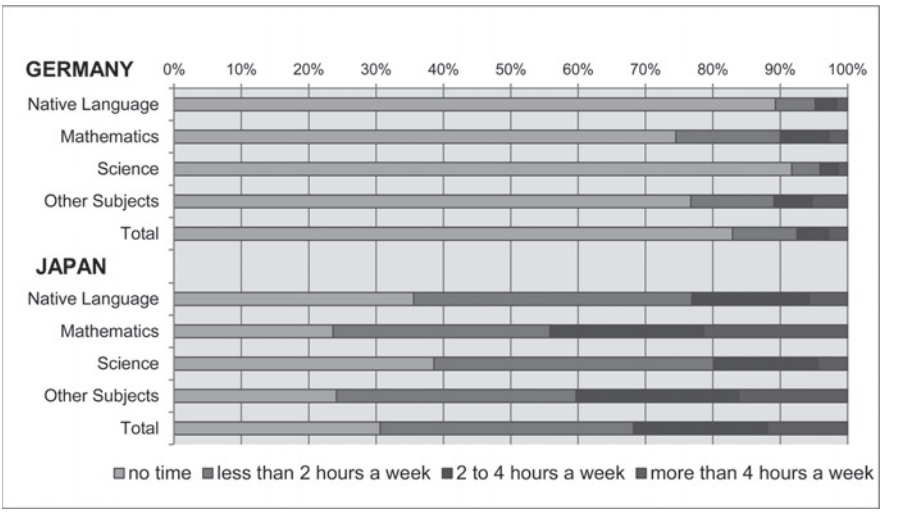

Figure 4: PISA 2009 "Weekly out-of-school time lessons/learning time in Germany and Japan" (in %). *Source:* PISA 2009, own calculation.

only a few students are involved in both types of extra classes (8.1 % to 10.8 %) at the age of 15.

In addition, PISA provides us with data about students' weekly time investment for out-of-school lessons. But here again, the Japanese translation is somewhat inaccurate: It was asked how much time students spend for studies "outside of regular school lessons" (*jugyō jikangai no benkyō*) instead of specifically asking about out-of-school lessons only. Thus the Japanese sample most

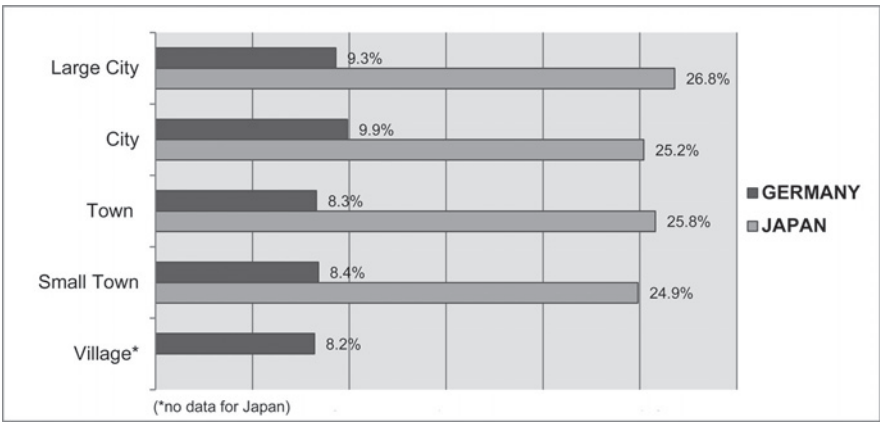

Figure 5: PISA 2009 "Use of out-of-school lessons in Germany and Japan in different population areas" (in %). The displayed area categories are defined as follows: village (including rural areas): fewer than 3,000 people; small town: 3,000 to about 15,000 people; town: 15,000 to about 100,000 people; city: 100,000 to about 1,000,000 people; large city: over 1,000,000 people. *Source:* PISA 2009, own calculation.

likely reflects the total learning time of students including self-study. Again the German questionnaire was much closer to the English original. This may be the main reason why, as shown in Figure 4, the ratios for this item are much higher for Japanese (70 %) than for German students (18 %). The subject with the highest attendance ratio in both countries is mathematics (Germany: 26 %; Japan: 77 %). Through the support of a teacher, extra classes outside regular school lessons are generally believed to be more effective than self-study. Consequently, if German and Japanese out-of-school lessons have enrichment effects on academic achievement, these effects will show clearer for Germany than for Japan. On the bright side, it is at least possible to see the overall effect of out-of-school studies on academic achievement for Japan. The introduced variable will be included in the analysis as a dummy variable with the reference "no time" for each of the three invested time amounts.

Taking into account regional differences in the attendance of out-of-school lessons (Benesse 2010: 98–99) and their effect on academic achievement (Mimizuka 2007), my analysis also considers the population density of a students' home town when predicting the effects of out-of-school lessons on PISA performance (Figure 5).

Contrary to my expectations, no significant differences in the attendance ratios in large cities (Germany: 9.3 %; Japan: 26.8 %) and small towns (Germany: 8.4 %; Japan: 24.9 %) are detected in either country. This means out-of-

school lessons are generally provided in all types of areas. Therefore, if there is a different impact of out-of-school education in different areas, this is not due to attendance ratios but to different amounts of investment in extracurricular lessons of different types.

3.4 Control variables

To proceed we have to consider further influential variables that have to be controlled in our analysis. Of special interest are school grade and school program, since these are supposed to have great influence on learning outcomes (Marks 2005: 484). In Germany the different tracks of the secondary school system are highly stratified according to students' academic achievement and social background (Ojima and von Below 2010: 277). Table 1 shows the distribution of German 15-year-old students for the different school tracks.

Table 1: Distribution of high school students according to school track and social background (Germany).

Germany	Low ESCS	Lower middle ESCS	Higher middle ESCS	High ESCS	Total (Count)
Gymnasium	8.0	17.0	26.1	**48.8**	256,804
Realschule	22.5	**28.5**	**24.8**	24.2	238,031
Gesamtschule	22.7	23.6	25.9	27.7	56,662
Hauptschule	**43.8**	23.2	16.8	16.1	146,518

Source: PISA 2009, own calculation

Although the *Gymnasium* is the school track that is attended more than any of the other tracks, nearly every second student at the *Gymnasium* has a high ESCS (highest 25 % of society). For the *Hauptschule* things are different: more than 40 % have disadvantaged family backgrounds. In Japan all senior secondary school graduates have the opportunity to access different higher education institutions. However, there are two major tracks: a general academic (*futsūka*) and a vocational track (*senmon gakka*). But, as stated earlier, the Japanese academic high school system is also highly stratified through the prestige high schools have gathered on the basis of the percentage of students that enter high-ranked universities (Ojima and von Below 2010: 277). To get into these universities, solely performance counts, since entrance examinations remain the deciding factor for entering (Takeuchi 1997: 184). Following Taki

(2011), the performance of students was used as a proxy for schools' ranks due to a lack of data about the advancement ratio of students to higher education. Academic high schools were classified into three different ranks: General A, General B, and General C high schools. In addition, we find a vocational school track (Table 2).

Table 2: Distribution of high school students according to school rank and social background (Japan).

Japan	Low ESCS	Lower middle ESCS	Higher middle ESCS	High ESCS	Total
General A	7.1 %	16.6 %	30.8 %	**45.6 %**	171,587
General B	18.6 %	**23.8 %**	**27.6 %**	30.0 %	487,664
General C	**38.3 %**	27.8 %	18.4 %	15.5 %	178,272
Vocational schools	**38.0 %**	28.7 %	18.7 %	14.6 %	264,965

General A = most students of these schools reached the PISA proficiency level 5 or 6 in MATH (highest); General B = most students of these schools reached the PISA proficiency level 3 or 4 in MATH; General C = most students of these schools reached at max. the PISA proficiency level 3; Voc. Schools = all public and private vocational schools. *Source:* PISA 2009, own calculation.

Comparable to Germany, we also find a high social stratification for Japanese high schools. While more than 45 % of the student population of General A schools have a high ESCS, at General C or vocational schools nearly 40 % of the students have a disadvantaged background.

For the German case, a dummy variable concerning the current grade (1 = 10^{th} grade; 2 = $9^{th}/8^{th}$ grade) of the students has also to be included in the analysis. Unlike their Japanese peers, not all 15-year-old German students were already in 10^{th} grade at the time of the survey.

To acknowledge differences between students of different gender, I will also include a dummy variable concerning "gender" (1 = male, 2 = female).

3.5 Lessons from PISA: out-of-school education and students' performance

Using the introduced performance scores as dependent variable, the influence of the explanatory variables about students' participation in out-of-school lessons and students' economic, social, and cultural status (ESCS) on the indicated score differences in international comparison is illustrated. The perform-

ance scores within the three fields reading, mathematics, and science literacy in Japan and Germany are predicted through linear regression modeling.[6]

First, Gender and ESCS are the only explanatory variables for students' performance (independent variable) in model 1 (Table 3). Before out-of-school lessons are included in this analysis, the influence of ESCS on students' performance using this baseline model is examined to acknowledge changes of direct ESCS effects due to shadow education.

Table 3: Regression analysis of predicting students' performance in READ, MATH, and SCIENCE (PISA 2009).

Model 1: Socio-demographic determinants	**Coefficient estimates**		
	READ	**MATH**	**SCIENCE**
Germany			
Intercept	513.54***	500.62***	512.57***
Gender (male)	−41.34***	12.83***	3.84
ESCS	44.54***	48.14***	50.56***
R^2	0.23	0.20	0.21
N (weighted average)	4560 (702029)	4560 (702029)	4560 (702029)
Japan			
Intercept	540.72***	524.69***	546.14***
Gender (male)	−36.54***	11.51*	−9.50**
ESCS	39.18***	39.08***	37.17***
R^2	0.12	0.10	0.08
N (weighted average)	5980 (1094358)	5980 (1094358)	5980 (1094358)

Significance: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. *Source:* PISA 2009, own calculation.

The ESCS of a student has a significant influence on students' performance in both countries. For German students, the direct effect of ESCS is responsible for 45 (READ) up to 51 (SCIENCE) points of performance difference; for Japanese students this effect explains less, but still there are performance score differences between 37 (SCIENCE) up to 39 (READ/MATH) points. Gender differences show that girls have an advantage in reading of about 36.5 (Japanese) to 41 (German) points, while in mathematics boys score higher. In science literacy, no gender differences for German 15-year-olds are found. Japanese girls show a significant advantage in science compared to boys (9.5 points).

6 All coefficient estimates were calculated using WesVar5.1 (Westat 2007).

Table 4: Regression analysis of predicting students' performance in READING, MATHEMATHICS, and SCIENCE (PISA 2009).

Model 2: Out-of-school lessons	**Coefficient estimates**		
	READ	**MATH**	**SCIENCE**
Germany			
INTERCEPT	539.25***	534.29***	541.56***
Gender (male)	−32.49***	16.10***	11.70**
ESCS	34.88***	40.10***	40.69***
Out-of-school lesson type			
Enrichment	−56.21***	−46.15***	−19.32
Remedial	−2.84	−10.51	−6.85
REF: not participating			
Weekly out-of-school time			
> 4 hours a week	−69.22***	−57.90***	−75.28***
2 to 4 hours a week	−47.51***	−27.92***	−45.32***
< 2 hours a week	−43.11***	−15.12**	−25.53*
REF: no time			
R^2	0.27	0.25	0.20
R^2 increase	0.04	0.05	−0.01
N (weighted average)	3120 (483361)	3205 (495866)	3020 (467468)
Japan			
INTERCEPT	514.33***	481.17***	518.63***
Gender (male)	−33.30***	16.94***	−7.98
ESCS	33.94***	28.04***	30.78***
Out-of-school lesson type			
Enrichment	22.84***	8.13**	23.21***
Remedial 1 (*hoshū jugyō*)	−10.72*	−12.39**	−29.04***
Remedial 2 (*hatten jugyō*)	−33.06***	−9.92**	−30.73***
REF: not participating			
Weekly out-of-school time			
> 4 hours a week	44.84***	91.90***	62.72***
2 to 4 hours a week	43.88***	64.59***	44.20***
< 2 hours a week	28.24***	31.67***	37.78***
REF: no time			
R^2	0.17	0.21	0.15
R^2 increase	0.05	0.11	0.07
N (weighted average)	5935 (1085172)	5925 (1084034)	5925 (1083479)

Significance: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. *Source:* PISA 2009, own calculation.

Model 2 includes variables about the types of out-of-school lessons and the weekly time spent on them (Table 4). Out-of-school lessons result in a decrease of gender differences in reading and an increase in mathematics in both countries, while such an increase in science is also found in Germany. The ESCS decreased up to 10 points (READ/SCIENCE) for Germany and up to 11 points (MATH) for Japan due to out-of-school education. This means that students who participate in shadow education are less influenced by their family background. In other words, shadow education itself also functions as a mediator of ESCS. In addition, supplementary education helps counteract gender differences.

In general, we find positive statistically significant effects of out-of-school lessons on performance for Japan only. Enrichment lessons in Japan result in higher performance ranging from 8 (MATH) to 23 (READ/SCIENCE) points. For Germany, no such positive effect is found. Here students who attend enrichment lessons show up to 56 (READ) points lower performance than students who attend no such lessons. Similar results are found for remedial lessons in both countries, but significant only for the performance of Japanese students (up to 33 points lower performance in reading by students attending *hatten jugyō*).

The variables about the weekly time spent on out-of-school lessons reveal the biggest difference between the two out-of-school education systems: While the effect of the different amounts of time invested in shadow education and in other forms of education outside of school is always significantly positive for Japan (up to 92 points in MATH, if invested more than four hours a week), we found exclusively negative effects for Germany (up to –75 points in SCIENCE, if invested more than four hours a week). This would mean that in general out-of-school education investments in Germany still result in learning outcomes below the PISA average, while Japanese investments show the opposite effect. According to these data, we would have to classify the German out-of-school education system as mostly remedial in purpose, whereas the Japanese system is enrichment in nature. However, before these results can be verified, we have to control other influential variables as well.

In our final model (Table 5) only the regression results for students' mathematics performance are shown, since the main results for all performance fields show only minor variations. Further explanatory variables are school track/rank and a dummy variable concerning grade differences in Germany. To show regional variation of the effects of out-of-school education on performance, analyses were carried out separately for different areas.

Table 5: Regression analysis of predicting students' performance in MATHEMATICS (PISA 2009).

Model 3: Out-of-school lessons' influence on performance in different areas	**Coefficient estimates for MATHEMATICS performance**				
	Total	**Area (Number of inhabitants)**			
		Large city (> 1 Mio.)	**City (> 100k–1 Mio.)**	**Town (> 15k–100k)**	**Small town (> 3k–15k)**
Germany					
INTERCEPT	405.30***	394.95***	379.04***	405.61***	427.85***
Gender (male)	22.55***	25.57**	16.96*	22.87***	24.32***
ESCS	14.11***	7.04	17.48***	13.21***	13.37**
School track					
Gymnasium	120.73***	115.75***	145.50***	122.75***	96.36***
Realschule	58.69***	28.75	60.45***	66.17***	40.95**
Gesamtschule	24.33**	10.67	53.51**	26.39*	2.20
REF: Hauptschule					
Grade 10	42.29***	51.50***	47.38***	39.59***	42.62***
REF: below 10th grade					
Out-of-school lesson type					
Enrichment	−19.71***	0.49	−15.82	−26.03**	−25.36*
Remedial	−23.37***	−31.38	−8.63	−26.72***	−16.87
REF: not participating					
Weekly out-of-school time					
> 4 h/week	−27.22***	−11.41	0.37	−35.45**	−42.95*
2–4 h/week	−15.72*	1.40	−40.38**	−2.27	−26.06
< 2 h/week	−9.05	−0.01	−29.64**	−7.16	−12.50
REF: no time					
R^2	0.54	0.59	0.64	0.53	0.48
R^2 increase	.	.	.	.	.
N (weighted average)	3040 (469845)	190 (32207)	430 (68700)	1505 (231088)	660 (102111)
Japan					
INTERCEPT	422.96***	409.04***	419.49***	410.32***	no
Gender (male)	16.20***	6.70	21.30***	18.56**	appropriate
ESCS	11.62***	14.11***	8.80**	7.54*	sample
School ranking					
General A	180.69***	206.04***	164.88***	159.78***	–
General B	100.68***	123.47***	98.19***	78.91***	–
Voc. schools	60.24***	68.96**	54.83***	68.49***	–
REF: General C					
Out-of-school lesson type					
Enrichment	11.53***	9.71*	8.18*	−1.47	–
Remedial 1 (*hoshū jugyō*)	1.19	−16.61*	−7.99*	−1.16	–

Table 5: (continued)

Model 3: Out-of-school lessons' influence on performance in different areas	**Coefficient estimates for MATHEMATICS performance**				
	Total	**Area (Number of inhabitants)**			
		Large city (> 1 Mio.)	**City (> 100k–1 Mio.)**	**Town (> 15k–100k)**	**Small town (> 3k–15k)**
Remedial 2 (*hatten jugyō*)	−22.01***	−5.49	−7.08*	−12.51*	–
REF: not participating					
Weekly out-of-school time					
> 4 h/week	16.96**	34.76**	41.59***	69.19***	–
2–4 h/week	18.07***	22.82*	26.48***	48.41***	–
< 2 h/week	13.31***	8.83	14.02**	26.55***	–
REF: no time					
R^2	0.43	0.53	0.44	0.38	–
R^2 increase	.	.	.	.	–
N (weighted average)	5870 (1074731)	1220 (229310)	2790 (511858)	1705 (305264)	–

Significance: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; REF = Reference category. *Source:* PISA 2009, own calculation.

In general, the direct effect of ESCS remains significant although it is decreasing heavily in both countries (more than 30 points), since school track/rank and grade are mediators of ESCS influence (Ojima and von Below 2010: 287). In Germany, the school track is responsible for performance differences of up to 121 points for *Gymnasium* students in comparison to students at a *Hauptschule*. In Japan, students who attend a top-ranked high school (General A) show up to 181 points higher performance than students at a low-ranked high school (General C). Therefore, the high school a student attends is decisive for academic success.

In accordance with hypothesis [H3], our analysis shows great area differences. For Germany, the influence of ESCS on performance becomes insignificant in large cities, but is strongest in cities with less than one million residents. In Japan, however, the influence of ESCS is strongest in large cities (14 points), continuously declining in less populated areas (7.5 points). On the other hand, no significant gender differences are found for Japanese students in large cities. The influence of school track or rank decreases in less populated areas in both countries – with one exception: large German cities. Here the school track

shows weaker effects on performance outcomes than in cities with a population between one million and 15,000 residents.

The effects of out-of-school lessons changed to some degree. While German students taking enrichment lessons are still ranked 20 points behind their classmates, Japanese students are able to increase their mathematics performance by 11.5 points. Regional variations are found though: In both countries, enrichment lessons show more positive effects on performance for students in large cities than in less densely populated areas. In Japanese cities with more than 100,000 residents the effects of enrichment lessons on performance are significantly positive (8 to 10 points). In smaller cities such effects are not found, indicating that there are indeed differences in the quality and supply of out-of-school lessons in different areas. In Germany, students in large cities manage to achieve the average level of performance due to enrichment lessons. Students in cities with less than 100,000 residents, on the other hand, show up to 26 points lower performance.

The participation in remedial lessons still shows no increase of performance above the national level in both countries. In Germany, remedial lessons are showing negative results regardless of area differences. The two Japanese remedial types of shadow education show differences between each other. While *hatten jugyō* is generally negative, especially in less populated areas, *hoshū jugyō* shows no negative effect on performance, again in particular for students living in less populated areas. This indicates that this type of shadow education includes lessons to improve the educational level of a student. A view to students' weekly invested time for out-of-school educational activities confirms the results of model 3: Through the participation in out-of-school education Japanese students enhance their PISA performance, while this is not the case in Germany. Although regional differences are also found, the Japanese out-of-school education system is of enrichment nature, as assumed in hypothesis [H2], while the German system is still aiming at increasing the academic level of students with learning deficits. Surprisingly, in Japan the time spent on out-of-school lessons is more effective on the performance of students living in towns than students living in larger cities. In Germany, however, the effects also vary according to area, but the found effects are not significantly negative – at best. The inconsistency in the effects of out-of-school study time demands further research in this field.

4 Discussion

We now can discuss the presented results of our analysis with respect to our three stated research hypotheses.

[H1] First, we found shadow education to be a decisive determinant for higher achievement scores in international comparison. While in Japan enrichment lessons and extracurricular learning time in general show significant positive effects on learning outcomes, this is not the case in Germany. For that reason, the higher usage ratio of out-of-school education provides a reasonable explanation for the Japanese success in PISA.

[H2] Secondly, it remains to be evaluated what type of out-of-school education systems we are confronted with in present-day Germany and Japan. Our data analysis showed that out-ot-school lessons in both countries have positive effects on learning outcomes. But according to Baker et al. (2001) shadow education systems differ in their characterization as either remedial (i.e., negative significant), enrichment (i.e., positive significant), or mixed (i.e., non-significant, or very small coefficients). For Germany it has to be stated that the system is still remedial in purpose, since an investment shows negative outcomes. This means, German students who invest in shadow education because of learning problems might be able to enhance their performance, but in general still cannot reach the performance levels of their peers. For Japan we found the opposite effect. Nearly every second Japanese student uses performance-enhancing enrichment lessons. In addition, time invested for outside of school education generally results in an enhancement of performance. Therefore, our data show that the Japanese out-of-school education system has advanced from a mixed to an enrichment system; the once remedial purpose is still visible in our analysis, but the general time investment outcome is predominantly of enrichment character.

[H3] Thirdly, the analysis has confirmed that out-of-school education varies in its influence on performance in different population areas. The influence of students' family background (ESCS) on performance shows higher influence in densely populated areas in Germany and Japan. Apparently, only in very large German cities with more than one million residents no significant effect of ESCS on performance is found if students use out-of-school education. In these areas, out-of-school education does have a neutralizing effect on educational disadvantages because of family background. However, the location plays a big role as to whether or not enrichment lessons contribute to higher performance. In both countries, trends indicate that enrichment lessons in highly populated cities have more effect on performance than in lower populated areas. In contrast, the effects of remedial lessons in different areas in Germany are generally negative, though this is hard to interpret and has to be content of further research. In Japan, although both remedial lesson types show no performance-enhancing effect, we found opposite effects in different areas. The overall time

invested in out-of-school educational activities also shows different results in different areas, ranging from 0 (city) to −42 (small town) points in Germany and 34 (large city) to 69 (town) points in Japan for students who invest more than four hours a week.

The findings of this paper also point out the need for future research in this field. Gender differences have to be further explained, as do regional differences within Germany and Japan, and in comparison between both countries. Our findings implicate that an out-of-school education system of predominantly enrichment character which is close-knit to the level of stratification of the high school system as found in large Japanese cities intensifies the impact social origin has on educational outcomes and results in increasing educational disparities. For Japan, major education reforms with the intention to create equal educational opportunities have to target the stratification of high schools and universities by putting greater weight on diplomas than on entrance examinations. If teaching methods and curricula of regular school were sufficient to prepare students for their educational and occupational life course, this would decrease shadow education to a healthy level. In Germany, the outcomes of recently implemented education reforms have to be evaluated continuously in order to make sure that no unintended developments arise that would entail new inequalities through extensive out-of-school lessons investments.

In closing, the limits of this analysis have to be mentioned. There are influencing variables that might be of great interest but could not be taken into consideration here, for example diversity between races or students with a migratory background. In Germany, in particular, differences in academic achievement and educational attainment are well known for students of different social background, but migratory background as well. The same goes for minorities in general. Also, variables of school quality need to be incorporated in future analyses.

Most importantly, the prevalent major shortcomings of PISA 2009 data have to be pointed out: (i) definition inaccuracy regarding out-of-school lessons; (ii) translation inaccuracy; and (iii) missing data. Unfortunately, not enough schools in rural areas are included in the PISA samples, in particular for Japan. It is of high interest to research whether or not students in rural areas have opportunities to attend extra classes at all. Fortunately, definition inaccuracies should be settled in the upcoming sixth PISA survey in 2015. According to one of the leading researchers in the field of shadow education, Mark Bray, this survey will contain detailed questions about shadow education and help separate different out-of-school educational activities from each other, clearly defining them as paid or unpaid, received at school, home, or at a private institu-

tion.[7] The problem of incorrect or infelicitous translations remains to be solved. For the Japanese case, out-of-school lessons should have been further differentiated into at least four different types. Correct and appropriate translations could be: (i) Enrichment lessons: *gakkō de osowaranai atarashii chishiki ya gakumon o oshieru jugyō,* 'lessons teaching new knowledge not taught at school'; (ii) remedial lessons: *gakkō de wakaranakatta koto o oshieru tame no jugyō,* 'lessons teaching things I did not understand in school'; (iii) skill-improving lessons: *benkyō no hōhō ya mondai no tokikata o oshieru jugyō,* 'lessons for study methods and task solution strategies'; and (iv) test preparation classes: *gakkō no saishū/nyūgaku shiken no junbi no tame no jugyō,* 'lessons to prepare for school exams and entrance exams'.

Acknowledgments: I would like to thank Prof. Fumiaki Ojima and Toshiyuki Shirakawa (Dōshisha University) for their help and support on my research concerning out-of-school education in Japan. Also I would like to thank my German advisor Prof. Wolfgang Lauterbach (University of Potsdam) for his advice and guidance, as well as two anonymous reviewers for their critical and most helpful comments.

References

Baker, David P., Motoko Akiba, Gerald K. Letendre & Alexander W. Wisemann. 2001. Worldwide shadow education: Outside-school learning, institutional quality of schooling, and cross-national mathematics achievement. *Educational Evaluation and Policy Analysis* 23(1). 1–17.

Becker, Rolf & Wolfgang Lauterbach. 2010. Bildung als Privileg: Ursachen, Mechanismen und Wirkungen. In Rolf Becker & Wolfgang Lauterbach (eds), *Bildung als Privileg: Erklärungen und Befunde zu den Ursachen der Bildungsungleichheit*, 11–49. Wiesbaden: VS Verlag.

Benesse. 2006. Gakushū kihon chōsa/kokunai chōsa [Learning study: Basic/domestic]. http://benesse.jp/berd/center/open/report/gakukihon4/hon/index_chu.html (accessed 1 May 2013).

Benesse. 2007. "Chōsa dēta kurippu! Kodomo to kyōiku:" Juku, naraigoto – dai 1 kai [Survey data clip about children and education: Juku and other learning activities, part 1]. http://benesse.jp/berd/data/dataclip/clip0006/clip0006a.pdf (accessed 30 August 2013).

Benesse. 2010. *Kodomo seikatsu jittai kihon chōsa hōkokusho* [Basic research report about children's living conditions]. Tokyo: Benesse Education Research and Development Center.

7 Personal communication, June 2013.

Boudon, Raymond. 1974. *Education, opportunity, and social inequality: Changing prospects in Western society*. New York: Wiley.

Bourdieu, Pierre. 1983. Education, opportunity, and social inequality: Changing prospects in Western society. In Reinhard Kreckel (ed.), *Soziale Ungleichheiten*, 185–199. Göttingen: Otto Schwartz Verlag.

Bray, Mark. 1999. *The shadow education system: Private tutoring and its implications for planners* (Fundamentals of Educational Planning 61). Paris: UNESCO, International Institute for Educational Planning.

Bray, Mark. 2006. Private supplementary tutoring: Comparative perspectives on patterns and implications. *Compare* 36(4). 515–530.

Bray, Mark. 2010. Researching shadow education: Methodological challenges and directions. *Asian Pacific Educational Review* 11. 3–13.

Bray, Mark. 2011. The challenge of shadow education: Private tutoring and its implications for policy makers in the European Union. European Commission, NESSE. http://www.nesse.fr/nesse/activities/reports (accessed 8 August 2013).

Bray, Mark & Chad Lykins. 2012. *Shadow education: Private tutoring and its implications for policy makers in Asia*. Hong Kong: Comparative Education Research Center (CERC) and Asian Development Bank.

Bray, Mark, André E. Mazawi & Ronald G. Sultana (eds). 2013. *Private tutoring across the Mediterranean: Power dynamics and implications for learning and equity*. Rotterdam: Sense Publishers.

Breakspear, Simon. 2012. *The policy impact of PISA: An exploration of the normative effects of international benchmarking in school system performance* (OECD Education Working Papers 71). Paris: OECD Publishing.

Dang, Hai-Anh & Halsey Rogers (eds). 2008. *How to interpret the growing phenomenon of private tutoring: Human capital deepening, inequality increasing, or waste of resources?* (Policy Research Working Paper 4530). Washington, DC: The World Bank.

Dawson, Walter. 2010. Private tutoring and mass schooling in East Asia: Reflections of inequality in Japan, South Korea and Cambodia. *Asia Pacific Educational Review* 11. 14–24.

Dierkes, Julian. 2010. Teaching in the shadow: Operators of small shadow education institutions in Japan. *Asian Pacific Educational Review* 11. 25–35.

Ditton, Hartmut. 2010. Selektion und Exklusion im Bildungssystem. In Gudrun Quenzel & Klaus Hurrelmann (eds), *Bildungsverlierer: Neue Ungleichheiten*, 53–71. Wiesbaden: VS-Verlag.

Dohmen, Dieter, Annegret Erbes, Kathrin Fuchs & Juliane Günzel. 2008. *Was wissen wir über Nachhilfe? Sachstand und Auswertung der Forschungsliteratur zu Angebot, Nachfrage und Wirkungen*. Bielefeld: Bertelsmann.

Drinck, Barbara. 2002. Marktorientierung im japanischen Bildungssystem. *Zeitschrift für Erziehungswissenschaft* 5(2). 261–278.

Entrich, Steve R. 2008. *Die Zukunft Deutschlands: Die Schaffung wirklicher Chancengleichheit? Befunde aus PISA auf dem Prüfstand. Working Paper*. München: GRIN Verlag.

Geißler, Rainer. 2006. *Die Sozialstruktur Deutschlands: Zur gesellschaftlichen Entwicklung mit einer Bilanz zur Vereinigung*. Wiesbaden: VS-Verlag.

Geißler, Rainer. 2010. *Die Sozialstruktur Deutschlands: Aktuelle Entwicklungen und theoretische Erklärungsmodelle*. Bonn: Bonner Universitäts-Buchdruckerei.

Geißler, Rainer & Sonja Weber-Menges. 2010. Bildungsungleichheit – eine deutsche Altlast: Die bildungssoziologische Perspektive. In Heiner Barz (ed.), *Handbuch Bildungsfinanzierung*, 155–165. Wiesbaden: VS-Verlag.

Guill, Karin & Martin Bonsen. 2011. Prädiktoren der Inanspruchnahme von Nachhilfeunterricht am Beginn der Sekundarstufe I. *Empirische Pädagogik* 25(3). 307–330.

Haag, Ludwig. 2001. Hält bezahlter Nachhilfeunterricht, was er verspricht? Eine Evaluationsstudie. *Zeitschrift für Pädagogische Psychologie* 15(1). 38–44.

Haag, Ludwig. 2007. *Wirksamkeit von Nachhilfeunterricht: Eine Längsschnittanalyse.* Gelsenkirchen: Bayreuth University.

Haag, Ludwig & Reinhold S. Jäger (eds). 2011. Nachhilfe: Empirische Befunde. *Empirische Pädagogik* 25(3).

Haasch, Günther. 1979. *Japanisches und Deutsches Bildungssystem: Versuch eines Systemvergleichs*. Tokyo: OAG.

Haasch, Günther. 2000. *Bildung und Erziehung in Japan: Ein Handbuch zur Geschichte, Philosophie, Politik und Organisation des japanischen Bildungswesens von den Anfängen bis zur Gegenwart.* Berlin: Ed. Colloquium.

Hamajima, Kōji & Kiyoshi Takeuchi. 2002. Kodomo no shingaku asupirēshon no kitei yōin ni kansuru kenkyū: Toshi shōchūgakusei no 15 nenkan no henyō [A study about the determinants of children's aspirations regarding the transition to a higher school level: The transformation of urban primary and middle school students over 15 years]. Paper prepared for the 54th Annual Meeting of the Japan Society of Educational Sociology Hiroshima.

Hosenfeld, Ingmar. 2011. Wirkungen von Mathematiknachhilfe bei rheinland-pfälzischen Schülern fünfter Klassen: Eine längsschnittliche Analyse. *Empirische Pädagogik* 25(3). 331–341.

Jäger-Flor, Doris & Reinhold S. Jäger. 2009. *Bildungsbarometer zum Thema Nachhilfe: Ergebnisse, Bewertungen und Perspektiven.* Landau: Verlag Empirische Pädagogik.

Jürgens, Eiko & Marius Dieckmann. 2007. *Wirksamkeit und Nachhaltigkeit von Nachhilfeunterricht: Dargestellt am Beispiel des Studienkreises.* Frankfurt: Peter Lang.

Kariya, Takehiko. 2013a. Understanding structural changes in inequality in education. Paper presented at the DIJ-Workshop "Social Inequality in Japan: A Reassessment." DIJ Tokyo.

Kariya, Takehiko. 2013b. *Education reform and social capital in Japan: The changing incentive divide.* Translation edited by Michael Burtscher. London & New York: Routledge.

Kariya, Takehiko & Kōkichi Shimizu. 2004. *Gakuryoku no shakaigaku: Chōsa ga shimesu gakuryoku no henka to gakushū no mondai* [Sociology of academic achievement: Study showing change of academic achievement and learning problems]. Tokyo: Iwanami.

Kataoka, Emi. 2001. Kyōiku tassei katei ni okeru kazoku no kyōiku senryaku: Bunka shihon kōka to gakkōgai kyōiku tōshi kōka no jendāsa o chūshin ni [Family strategy in educational attainment process in Japan: Effects of cultural capital and investment in extra-school education]. *Japanese Journal of Educational Research* 68(3). 259–273.

Kita, Kamiyo. 2006. Gakkōgai kyōiku riyō ni tsuite no nenrei, jendā-betsu no tokusei to kaisōteki yōin [Age, gender specifics and class determinants of out-of-school education usage]. *Education Practice Research* 14. 1–7.

Klemm, Klaus & Annemarie Klemm. 2010. *Ausgaben für Nachhilfe: Teurer und unfairer Ausgleich für fehlende individuelle Förderung.* Gütersloh: Bertelsmann Stiftung.

Konakayama, Akira & Toshihide Matsui. 2008. Gakkōgai kyōiku tōshi no gakuryoku ni oyobosu eikyō ni kansuru ikkōsatsu [An empirical study on how extra school education

affects academic achievement of Japanese high school students]. *Tokai University School of Political Science and Economics Bulletin* 40. 131–158.

Langness, Anja, Ingo Leven & Klaus Hurrelmann. 2006. Jugendliche Lebenswelten: Familie, Schule, Freizeit. In Shell Deutschland Holding (ed.), *Jugend 2006*, 49–102. Frankfurt: Fischer Taschenbuch Verlag.

Maaz, Kai. 2006. *Soziale Herkunft und Hochschulzugang: Effekte institutioneller Öffnung im Bildungssystem*. Wiesbaden: VS Verlag.

Marks, Gary N. 2005. Cross-national differences and accounting for social class inequalities in education. *International Sociology* 20(4). 483–505.

Mayr, Thomas. 2010. *(Kommerzielle) Nachhilfe – kritisch beleuchtet: Was wir heute wirklich über Nachhilfe wissen*. Bayreuth: University of Bayreuth doctoral dissertation.

MEXT (Ministry of Education, Culture, Sports, Science and Technology). 2006. Japan's education at a glance 2006. http://www.mext.go.jp/english/statistics/1303013.htm (accessed 10 December 2010).

MEXT (Ministry of Education, Culture, Sports, Science and Technology). 2008. Kodomo no gakkōgai de no gakushū seikatsu ni kansuru jittai chōsa hōkoku [National report about the out-of-school learning activities of children]. http://www.mext.go.jp/b_menu/.../1196664.pdf (accessed 5 March 2010).

Mimizuka, Hiroaki. 2007. Shōgakkō gakuryoku kakusa ni idomu: Dare ga gakuryoku o kakutoku suru no ka. [Determinants of children's academic achievements in primary education]. *The Journal of Educational Sociology* 80. 23–39.

Mori, Izumi. 2008. Kaigai ni okeru gakkōgai kyōiku kenkyū no dōkō: Kokusaiteki na kenkyū kōryū no hitsuyōsei [Trends in overseas out-of-school education: The need of international research exchange]. *Bulletin of the Graduate School of Education of the University of Tokyo* 47. 157–165.

OECD (Organisation for Economic Co-operation and Development). 2008. Student questionnaire for PISA 2009. http://pisa2009.acer.edu.au/downloads.php (accessed 10 April 2010).

OECD (Organisation for Economic Co-operation and Development). 2009. PISA data analysis manual. SPSS second edn. http://browse.oecdbookshop.org/oecd/pdfs/free/9809031e.pdf (accessed 13 March 2010).

OECD (Organisation for Economic Co-operation and Development). 2010a. PISA 2009 results: Overcoming social background – Equity in learning opportunities and outcomes (volume II). http://dx.doi.org/10.1787/9789264091504-en (accessed 1 December 2012).

OECD (Organisation for Economic Co-operation and Development). 2010b. *PISA 2009 nen chōsa hyōka wakugumi: OECD seito no gakushū tōtatsudo chōsa* [The framework of the 2009 PISA survey research evaluation: OECD students' academic achievement test]. Tokyo: Akashi Shoten.

OECD (Organisation for Economic Co-operation and Development). 2012a. *Lessons from PISA for Japan: Strong performers and successful reformers in education*. Paris: OECD Publishing. http://dx.doi.org/10.1787/9789264118539-en (accessed 10 August 2012).

OECD (Organisation for Economic Co-operation and Development). 2012b. *PISA 2009 technical report*. Paris: OECD Publishing. http://dx.doi.org/10.1787/9789264167872-en (accessed 10 August 2012).

Ojima, Fumiaki & Susanne von Below. 2010. Family background, school system and academic achievement in Germany and in Japan. In Japp Dronkers (ed.), *Quality and inequality of education*, 275–297. Dordrecht: Springer Verlag.

Okada, Akito. 2012. *Education policy and equal opportunity in Japan* (Asia Pacific Studies 4). New York & Oxford: Berghahn Books.

Roesgaard, Marie H. 2006. *Japanese education and the cram school business: Functions, challenges and perspectives of the juku*. Copenhagen: NIAS Press.

Rohlen, Thomas P. 1980. The *juku* phenomenon: An exploratory essay. *Journal of Japanese Studies* 6(2). 207–242.

Sato, Minako. 2005. "Juku boom:" Cram schools cash in on failure of public schools. *Japan Times*, 28 July. http://www.japantimes.co.jp/text/ek20050728a1.html (accessed 18 September 2012).

Schlösser, Hans-Jürgen & Michael Schuhen. 2011. Führt Nachhilfe zu Wettbewerbsverzerrungen? *Empirische Pädagogik* 25(3). 370–379.

Schneider, Thorsten. 2006. Die Inanspruchnahme privat bezahlter Nachhilfe: Ein kaum beachtetes Thema in der Bildungsforschung. In Claus Tully (ed.), *Lernen in flexibilisierten Welten: Wie sich das Lernen der Jugend verändert*, 131–144. Weinheim & München: Juventa.

Schümer, Gundel. 1999. Mathematikunterricht in Japan: Ein Überblick über den Unterricht in öffentlichen Grund- und Mittelschulen und privaten Ergänzungsschulen. In Volker Schubert (ed.), *Lernkultur: Das Beispiel Japan*, 45–76. Weinheim: Deutscher Studien-Verlag.

Seiyama, Kazuo. 1981. Gakkōgai kyōiku tōshi no kōka ni kansuru ichikōsatsu [A study of the effects of out-of-school educational investment]. *The Annual Report on Cultural Science* 30(1). 171–221.

Seiyama, Kazuo & Yuji Noguchi. 1984. *Kōkō shingaku ni okeru gakkōgai kyōiku tōshi no kōka* [Extra-school educational investment and the opportunity of entering higher ranking high schools]. *The Japan Society of Educational Sociology* 39. 113–126.

Shavit, Yossi & Hans-Peter Blossfeld (eds). 1993. *Persistent inequality: Changing educational attainment in thirteen countries*. Boulder: Westview Press.

Stanat, Petra, Cordula Artelt, Jürgen Baumert, Eckhard Klieme, Michael Neubrand, Manfred Prenzel, Ulrich Schiefele, Wolfgang Schneider, Gundel Schümer, Klaus-Jürgen Tillmann & Manfred Weiß (eds). 2002. PISA 2000 – Die Studie im Überblick: Grundlagen, Methoden, Ergebnisse. http://www.mpib-berlin.mpg.de/Pisa/PISA_im_Ueberblick.pdf (accessed 15 February 2008).

Stevenson, David L. & David P. Baker. 1992. Shadow education and allocation in formal schooling: Transition to university in Japan. *American Journal of Sociology* 97. 1639–1657.

Streber, Doris, Ludwig Haag & Thomas Götz. 2011. Erfolgreiche Nachhilfe: Kann das jeder oder bedarf es besonderer Qualifikationen? *Empirische Pädagogik* 25(3). 342–357.

Takeuchi, Yo. 1997. The self-activating entrance examination system: Its hidden agenda and its correspondence with the Japanese "salary man." *Higher Education* 34. 183–198.

Taki, Hirofumi. 2011. Nichi-doku-bei ni okeru 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]. *Sociological Review* 62(2). 136–152.

Tobishima, Shūji. 2012a. Gakuryoku no kaisōsa no kakudai to kazoku no kyōiku senryaku: Gakkōgai kyōiku tōshi ni yoru kakusa kakudaisetsu no saikentō [The role of shadow education in the growing inequality in academic achievement]. *Shakaigakukenkyū* 91. 195–214.

Tobishima, Shūji. 2012b. Kōkōsei no gakushū jikan ni taisuru sōki gakkōgai kyōiku tōshi no eikyō [Impact of early outside of school education on learning time of high school students]. *Annual Journal of Sociology* 25. 144–155.

Tomura, Akihito, Ryōichi Nishimaru & Teruya Oda. 2011. Kyōiku tōshi no kitei yōin to kōka: Gakkōgai kyōiku to shiritsu chūgaku shingaku o chūshin ni [Determinants and effects of investments in education: Focusing on out-of-school education and transition to private middle schools]. In Yoshimichi Satō & Fumiaki Ojima (eds), *Gendai no kaisō shakai: Kakusa to tayōsei* [Modern class society: Disparity and diversity], 267–280. Tokyo: University of Tokyo Press.

Westat. 2007. *WesVar 4.3 user's guide*. Rockville, MD: Westat.

Yamamoto, Yoko & Mary C. Brinton. 2010. Cultural capital in East Asian educational systems: The case of Japan. *Sociology of Education* 83(1). 67–83.