

German and Japanese Education in the Shadow - Do Out-of-School Lessons really contribute to Class Reproduction?

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Abstract

Considering the great impact the first PISA-results caused in Germany and Japan, this study seeks to provide an explanation for the continuous higher achievement rates of students in the PISA-winner country Japan compared to their German peers. Another great difference between the two participants that was detected in PISA is the correlation between students' social origin and educational achievement, which is still very strong in Germany but not in Japan. The author assumes the reason for these differences lay outside the formal school system, in the sector of shadow education. The so called juku-industry in Japan provides out-of-school lessons that seem to enable all Japanese students to achieve top results regardless of their social origin. In Germany the increased use of Nachhilfe is seen as an indicator for the downfall of the compulsory school system and a problem that seem to widen the gap in education levels all the more. If in Japan almost every household regardless of its social status sends its children to out-of-school classes, the assumption that people do invest in further education in terms of extra classes at juku believing this will have a neutralizing effect on disadvantaged family background suggests itself. Consequently the author intends to refute the prevailing assumption of researchers in Germany and Japan stating that out-of-school lessons just contribute to the reproduction of class structure. Using secondary data as well as PISA-data the author wants to show that shadow education helps to counteract educational disadvantages through the provision of various educational opportunities.

Keywords: Shadow education; Comparative education; Out-of-school education; Social disparities; Germany, Japan, PISA 2009.

Introduction

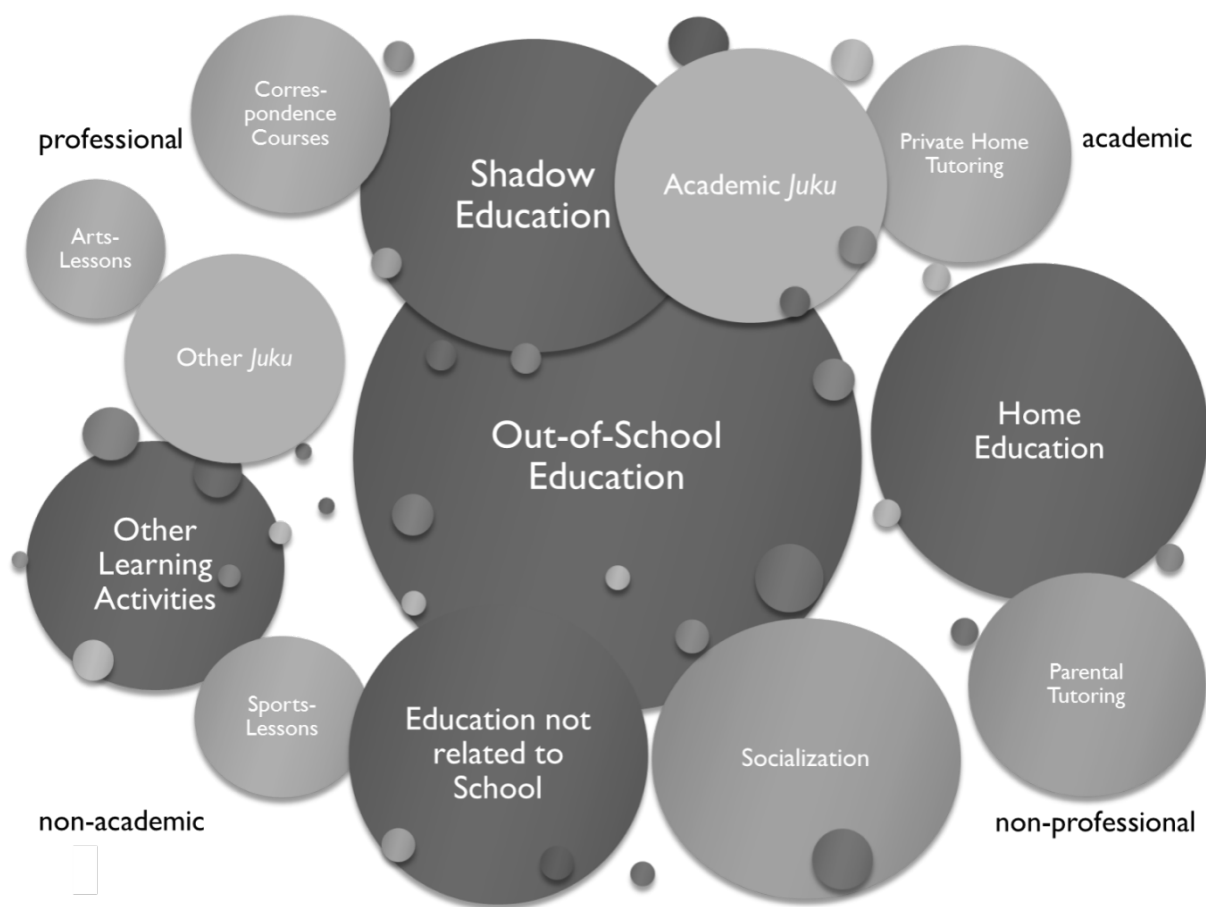
The publishing of the first results of the Programme for International Student Assessment (PISA) caused a public, political and scientific debate about education in Germany. Germany's hope for a top position was unfortunately not a reality. Instead, the OECD certified that German students show at best mediocre performance within the study. In addition, students' social origin correlated strongly with educational achievement in Germany (Stanat, Artelt, Baumert, Klieme, Neubrand, Prenzel, Schiefele, Schneider, Schümer, Tillmann, & Weiß, 2002, p.12). German researchers began to ask how Germany's educational system could have performed so poorly amid other OECD countries and what was done differently in PISA winner countries such as Japan? Not only were Japanese students able to achieve top results. The influence of students' social origin on the performance in PISA was the lowest in Japan amid the participants (ibid., p.12). The Japanese seem to have found a way to neutralize disadvantaged family background through education enabling all students to achieve a high level of education regardless of the wealth of their parents. Considering that the formal school system possesses no apparent significant differences that could clearly explain the Japanese success over Germany (von Kopp, 2000, pp.181-82) another explanation had to be found. Not only can the formal school system be held responsible for the success of its students. Also education outside of school has to be acknowledged to understand the Japanese success (Schümer, 1999, p.46). These responsible out-of-school lessons are called shadow education.

Shadow Education and its Implications

A shadow education system is an educational system of private institutions and organizations operating alongside the formal school system. Stevenson and Baker (1992) defined shadow education as *"a set of educational activities that occur outside formal schooling and are designed to enhance the student's formal school career"* (p.1639). Also shadow education is supposed to

“improve student’s chances of successfully moving through the allocation process [while it is] firmly rooted within the private sector” (pp.1640-42). Based on this definition, Bray (1999, 2010) identified three main points of essence: (1) shadow education is academic in nature, clearly excluding all non-academic forms of out-of-school education, like arts or sports lessons, from this definition; (2) shadow education is used as a supplement, and is therefore not covering classes outside the school spectrum, like language classes for children with migratory background; and (3) shadow education is private, meaning all non-professional forms, such as parental help with homework, or unpaid remedial classes at school are excluded from this definition, since shadow education is commercial in nature and always fee based (Bray, 2010: 4).

Figure 1. Different Types of Out-of-School Education

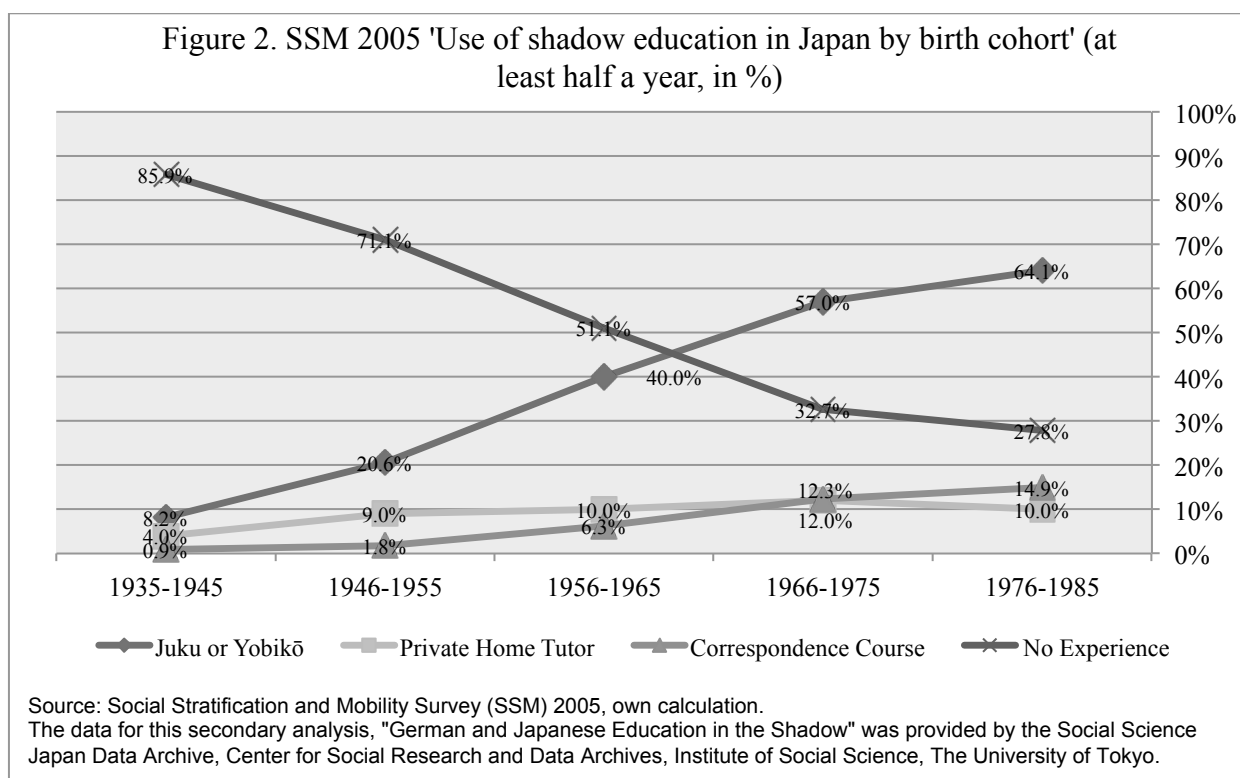


In conclusion, only these types of out-of-school education are characterized as shadow education which are professionally organized by private providers (professional) and school subject related (academic) (Figure 1). As recent research indicates, these out-of-school lessons show a positive effect on academic achievement (e.g. Baker, Akiba, LeTendre & Wisemann, 2001; Guill & Bonsen, 2011; Haag, 2001, 2007; Hosenfeld, 2011; Konakayama & Matsui, 2008; Mimizuka, 2007; Ojima & von Below, 2010; Southgate, 2009; Streber, Haag & Götz, 2011; Tomura, Nishimaru & Oda, 2011).

Today shadow education can be found all around the globe (Bray, 1999; 2010). Particularly in Japan the use of out-of-school classes has a long tradition. The main providers are private schools, the academic *juku* (*gakushūjuku*) - often referred to as cram schools (e.g. Roesgaard, 2006). After the great *juku*-boom (Rohlen, 1980) in the 1970s as a result of the extraordinary high increase of educational aspirations of the Japanese population in the course of educational expansion, the Japanese shadow education system expanded steadily (Haasch, 2000, p.195; Dierkes, 2010a, p.26), as illustrated in Figure 2. Instead of the Japanese government, which did not meet the educational needs of worried parents, private operators promised help through the provision of supplementary classes at their *juku* (Haasch, 1979, pp.43, 45-46; Drinck, 2002, p.263). A *juku* is a private for-profit school offering all sorts of instructions in academic as well as non-academic fields. While non-academic *juku* are concerned with *naraigoto*¹, academic *juku* are school subject related and offer private tutoring, enrichment as well as remedial classes or the preparation for tests and (entrance-)

¹ *Naraigoto* are afternoon activities often organized in clubs (*bukatsudō*) directly taking place on school grounds or at *juku*. Whereas many students come together to build teams and train with each other in sports such as baseball or soccer, other students explore their musical and artistic skills in singing and dancing classes or take piano lessons. Also, classes are popular, where students learn to use the Japanese abacus (*soroban*), learn calligraphy or are instructed in martial arts (*būdō*) (von Kopp, 2000: 180; MEXT, 2008: 15).

exams. Besides, the variety of supply ranges from simple help with homework to courses that let students expand their knowledge beyond their peers' education level (Dierkes, 2010a, pp.26-27; Komiyama, 1993, pp.82-87). Besides *juku*, lessons given by private home tutors and correspondence courses are the most popular shadow education types in Japan. Currently almost every Japanese student is taking or has taken lessons at *juku* (Konakayama & Matsui, 2008, p.131).



Consequently the so called *juku*-industry, as this national supplemental private tutoring entity external to the formal education system is entitled, provides one possible explanation for Japanese students' high performance in international large scale assessment studies, such as PISA.

Nowadays the phenomenon of rising demands for private supplementary education has also increased in most western countries, such as Germany. In Japan, *juku*-owners promote that shadow education will lead to the superior results of the Japanese youth compared to compulsory school

education (Dierkes, 2010a, p.25). In Germany, comparable programs are provided by *Nachhilfe*-schools, whose heads make the same promises which operators of private educational institutions make all over the world: they lure students with the promise for better pedagogical concepts that give parents a way out of an educational misery – successfully as it seems. Particularly since the 1990s the use of professional out-of-school lessons in Germany has strongly increased (Guill & Bonsen, 2011, p.307; Mayr, 2010, pp.10-11). The German *Nachhilfe*-system has expanded and became an influential factor educationally as well as economically. Various conservative estimates suggest that around 1.1 million German students yearly use *Nachhilfe*. This industry has approximately already a turnover up to nearly 1.5 billion Euros a year (Klemm & Klemm, 2010, p.20). Although these numbers may seem impressive, the German *Nachhilfe*-system with its approximately 3.000 to more than 4.000 *Nachhilfe*-school branches is still in an early stage of development compared to the Japanese *juku*-system that generated approximately US\$15.2 billion in 2012 (Yano Research Institute, 2013).

While in Japan most shadow education has been professionalized and is mostly taking place at *juku*, in Germany other forms of shadow education are still predominant. Only about 30% of all shadow education in Germany takes place at *juku*-like institutions, the *Nachhilfe*-schools (Dohmen, Erbes, Fuchs, & Günzel, 2008, p.53). In comparison, in Japan there are even more *juku* (almost 50.000) today than formal schools combined (about 39.000) (BERD, 2007, p.2). This indispensable addition to the public compulsory school system has become influential in such a way, that it is perceived the Japanese formal school system alone cannot prepare students for their later life course in a proper way anymore (Sato, 2005). In promotion with this belief, local officials have advocated for the *juku*-schools as positive alternatives and actually pursue partnerships with those institutions to improve their learning opportunities (Dierkes, 2010b).

The fear compulsory schools will not be able to sufficiently educate children anymore is already present in Germany, too. In general, in Germany students needing *Nachhilfe* is seen as a problem and an indicator for the downfall of the compulsory school system. The idea the compulsory school system is no longer able to equip students with the needed armamentarium to succeed in school and thereafter is a national issue of concern. In fact, the high costs for private lessons seem to intensify social disparities and widen the gap between rich and poor all the more, as some studies indicate (Schneider, 2004, 2006). While in Japan all social classes seem to be able to use expensive out-of-school education, this is not the case in Germany. Whether it really is the costs that some German parents cannot afford, the unwillingness to pay for supplementary education for their child, or it is the nescience about what shadow education can possibly offer, has not been sufficiently researched yet.

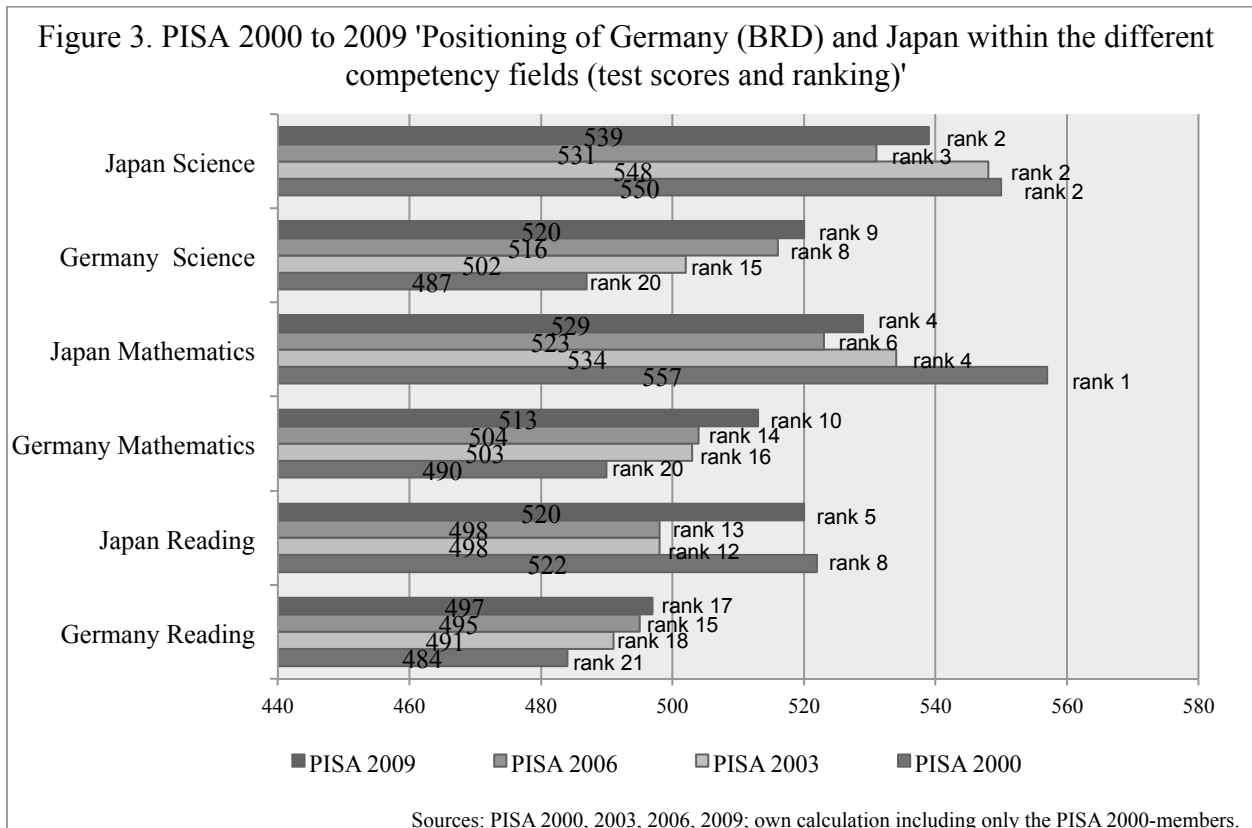
As social scientific research on education has proven, the socioeconomic background and parents' educational aspirations in conjunction with the students' academic achievement are decisive for the making of educational decisions. The difference in educational prerequisites at the beginning of a students' school career (primary effect) and parents' different cost-benefit considerations based on their educational aspirations (secondary effect) result in educational as well as social inequality (Becker & Lauterbach, 2010; Boudon, 1974; Breen & Goldthorpe, 1997; Esser, 1999). Hence, these primary as well as secondary effects of social origin exert great influence on educational pathways. Parents tend to invest in the educational trajectory of their child as long as the expected returns to education exceed the costs (Becker & Lauterbach, 2010, pp.15-19). If in Japan almost every household sends its children to *juku*, parents might indeed think that an investment in supplementary education will pay off for their children. This provides a reasonable explanation for the attested low achievement range between Japanese students with high and low social origin in PISA.

The Cause of the Achievement Gap: The Use of Professional Shadow Education

Before the question if out-of-school lessons contribute to the reproduction of class structure or if shadow education may in fact counteract educational disadvantages through the provision of various educational opportunities can be discussed, the theoretical framework of such a thesis has to be determined. Of greatest interest for this work is to first prove if Japanese students are constantly achieving better results compared to their German peers. Therefore, in the following some results of the most popular international student achievement study PISA will be presented.

Educational Achievement in International Comparison

After Germany has been absent from its participation in international student assessment studies for nearly 30 years, the empirical educational research in Germany was rediscovered as a powerful means for educational policies in the late 1990s (Arnold, 2001, pp.161-63). Unfortunately, the hoped for top-position within the PISA study of the year 2000 remained a dream. On the contrary, a comparatively low performance was attested (Figure 3). As we can see, it seems that Japanese students achieve always significantly higher results in all fields of performance within the PISA study than their German peers. Over the last decade, German students never reached the competency levels of their Japanese opponents. In the PISA survey of the year 2000 Japanese students achieved rank 1 in mathematics, rank 2 in science and rank 8 in reading literacy, showing nearly equally good results in 2009 (ranks 4, 2 and 5 respectively). 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 made it barely to the lower middle field in international comparison. Although the results for Germany were getting better over the years (2009: mathematics rank 10, science rank 9, reading rank 17) ranks within the PISA top field could not yet be achieved.



Taking into account the limitations of the PISA study, such as cultural patterns, the questionnaires' item style, and sample variations between countries (Hamano, 2011, pp.3-4); the significant differences between the performance score means of German and Japanese students are still evident and need further explanation.

Since PISA attempts to measure literacy, also described as 'application ability' (Hamano, 2011, p.2), meaning the ability to achieve skills and knowledge instead of measuring the actual achieved knowledge and skills of students; the differences between Japanese and German students' PISA performances are not found in the regular schooling system of each country only. Additional educational opportunities have to be taken into account as well.

Quantity and Quality of Instruction in both Countries

One could assume that the higher achievement rates of Japanese students may be mainly caused by longer study hours at school or better teaching quality. As will be shown in the following, this is not the case.

The quantitative learning time of students in Germany and Japan today does not differ very much or, at least, in Japan the time spend in school is not significantly higher than in Germany. Table 1 shows the medians of the number of class periods in both countries, also considering the three performance fields of the so far conducted surveys of the PISA study.

Table 1. PISA 2000 to 2009 'Number of weekly class periods per subject'

Country			native language	mathematics	science	all subjects
Germany	PISA 2009	valid	659798	656892	637595	636625
		missing	107194	110100	129397	130367
		median	4	4	5	32
	PISA 2003	valid	-	791269	-	707022
		missing	-	93089	-	177336
		median	-	4	-	30
	PISA 2000	valid	740064	738005	771749	-
		missing	86752	88811	55067	-
		median	4	4	4	-
Japan	PISA 2009	valid	1074149	1073655	1073630	1081283
		missing	39253	39748	39772	32119

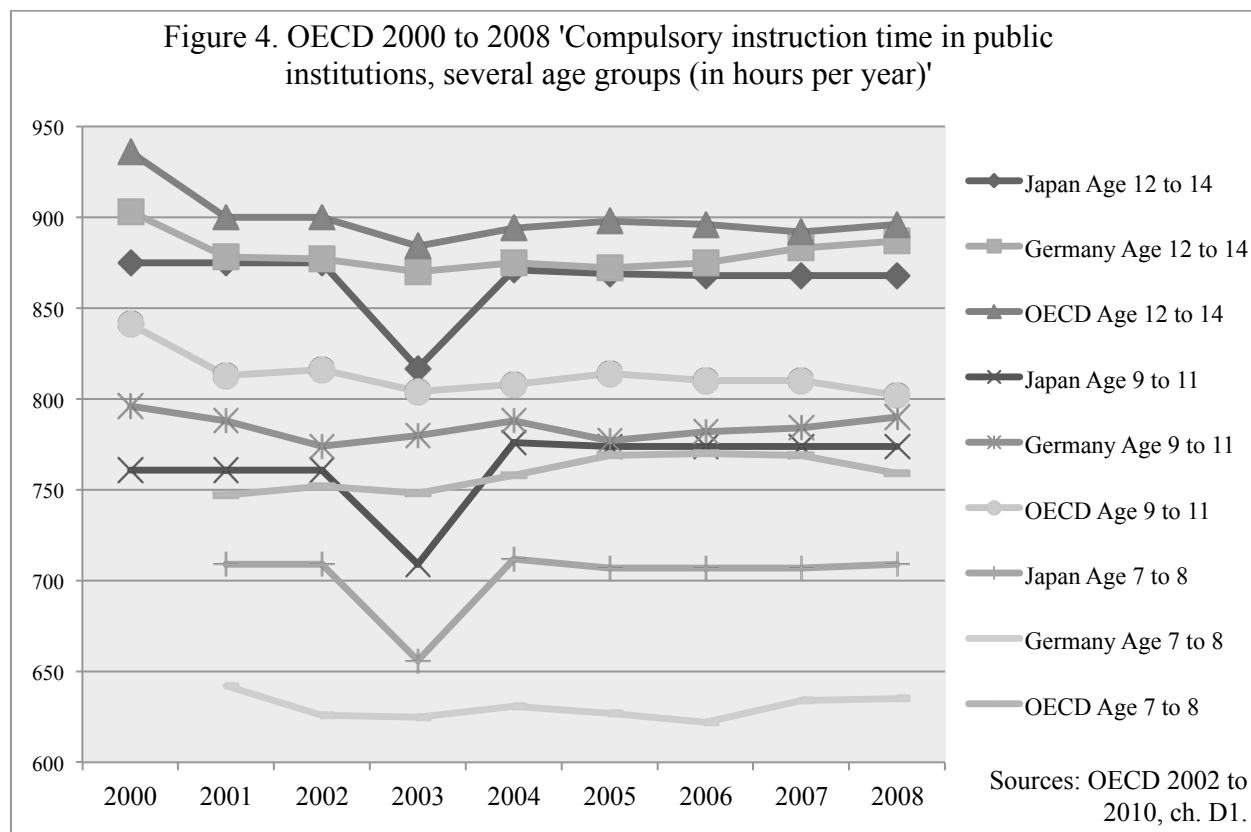
	PISA 2003	median	4	5	3	31
		valid	-	1162943	-	1054582
		missing	-	77111	-	185472
	PISA 2000	median	-	4	-	30
		valid	1221428	1228372	1210646	-
		missing	225168	218224	235950	-
		median	5	5	4	-

Sources: PISA 2000, 2003, 2009, own calculation.

One class period is equal to 45 minutes for Germany and 50 minutes for Japan.

The data of PISA 2006 is not considered, because no clear categories were defined.

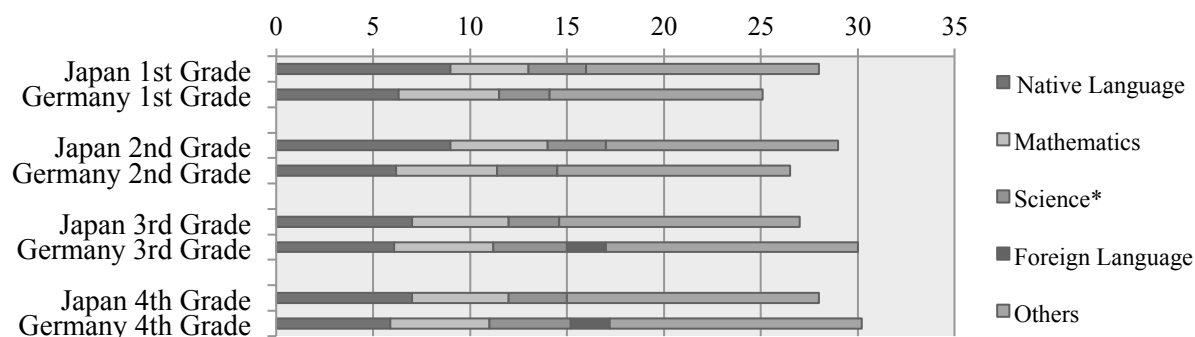
Here a development in school learning time from PISA 2000 to PISA 2009 can be found. While in Germany the learning time increased in general from 30 (2003) to 32 (2009) class periods per week and in the field science from 4 (2000) to 5 (2009) weekly class periods, it decreased in Japan in native language as well as in science about one class period from 5 (2000) to 4 (2009) and 4 (2000) to 3 (2009) respectively. Further data as conducted by the OECD might show if the learning time in Japan differs very much prior to 9th grade or not (Figure 4).



Although the overall instruction time seems to even be slightly higher in Germany for 9- to 14-year olds, a real difference in instruction time can only be detected for students of the age 7 to 8. Even the comparison of instruction time in the three subjects related to the three performance fields of PISA reveals no great differences between German and Japanese students aged 9 to 14 (own calculation on the basis of OECD, 2002 – 2010, ch. D1).

A glance on public primary schools in both countries shows that there is a difference in the total number of school hours, but no huge differences in the time spend for the PISA related subjects. Only in native language real differences seem visual (Figure 5).

Figure 5. Instruction time 2011 'Compulsory instruction time in public primary schools per subject and number of class periods'



Sources: Numano, 2011 (for Japan); primary school regulations of the 16 different federal states of Germany. One class period is equal to 45 minutes in Germany as well as in Japan.

*The subject science includes "Living Environment Studies" for Japan and "Sachkunde" for Germany.

Due to the reformation of primary education in Japan as initiated in 2008, the time for instruction in school has increased for the first time in 30 years, since the gradual implementation of the *yutori kyōiku* (no-pressure education) reforms in the 1980s. Especially for native language and science more time is now invested (Numano, 2011, p.8). On the other hand, the curricula in Germany have also been reformed since the implementation of curriculum and school structure reforms after the great PISA-shock in 2001 (Ertl, 2006). In conclusion it has to be stated that the differences between the amount of instruction time in German and Japanese schools in the three above mentioned PISA-related subjects are not convincing enough to serve as an explanation for higher achievement rates. The pure quantity of lessons is not that different in both countries, so a clear explanation for the much higher achievement rates in Japan is still missing.

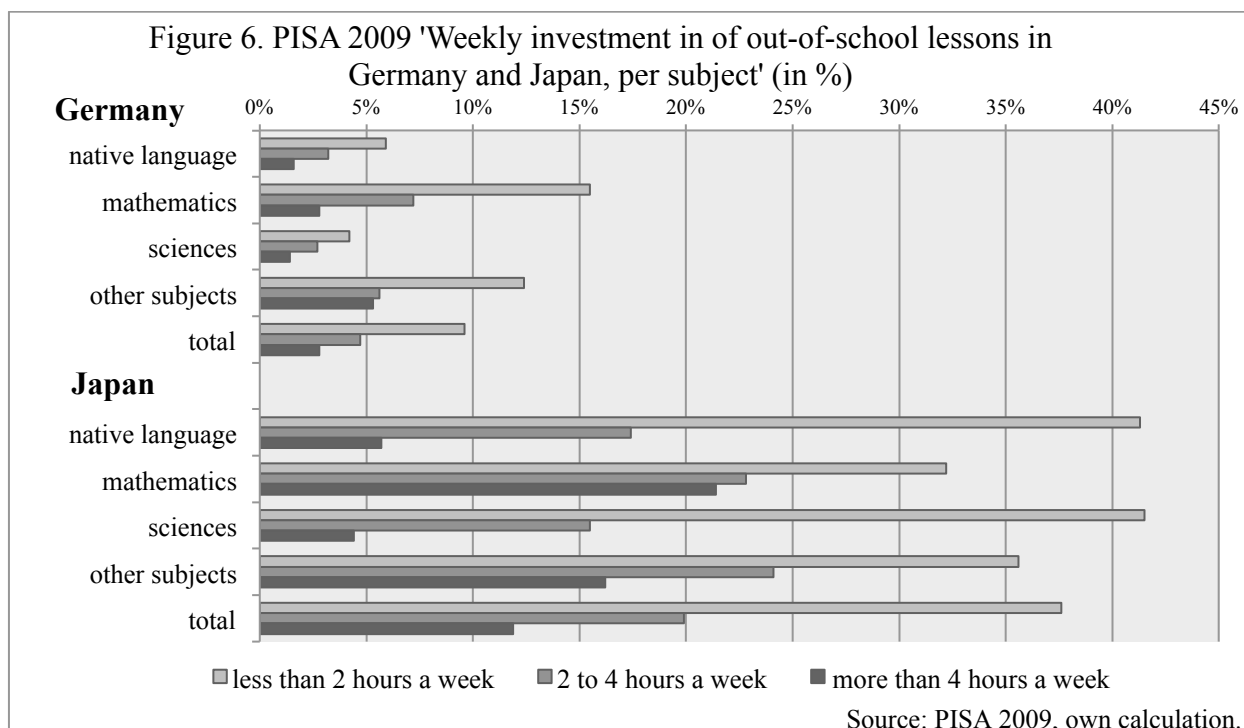
Against the prevalent view of researchers and politicians across the world, who tended to praise the Japanese education system for its high academic standards and quality (e.g. Akiba, LeTendre, & Scribner, 2007; OECD, 2012; Stevenson & Stigler, 1992; Stigler & Hiebert, 1999; Stigler & Stevenson, 1991) or even tried to emulate Japanese education, like the United States did back in the

1980s due to the 'A Nation at Risk' report (Fujita, 2010, p.21); the quality of Japanese schooling needs actually to be viewed critically. In fact, the higher quality of teaching is mostly found in primary schools rather than in middle or high schools (von Kopp, 2000, p.181f.). This was again verified by a recent study carried out by Peter Cave (2011). Despite a number of education reforms over the last 20 years, Cave found that Japanese middle schools continue teaching practices, which can hardly be characterized as quality instruction. On the contrary, 'exploratory thinking and independent learning' are maybe found at the primary school level, but not so thereafter (Cave, 2011, p.149).

As Schümer (1999) noted, a possible higher quality of instruction and thus effectiveness is made possible by an investment in extra classes outside of school (Schümer, 1999, pp.50-52). Nevertheless, until today the Japanese *juku*-industry has not been acknowledged for what it is: an indispensable addition to the public school system (e.g. OECD, 2012, p.202). Even though in Japan everybody seems to know that "*[e]ducational achievement is prompted by a broad societal and educational infrastructure, of which formal schooling is just one part*" (Tanabe, 2000, p.125), the major role of shadow education is rarely accounted for.

A possible explanation for the higher achievement rates of Japanese students in PISA is found in the far greater investment in out-of-school education in comparison to German students. Consequently, Japanese 10th graders have to receive longer instruction times by generally attending significantly more out-of-school classes than their German peers (Figure 6). Taking into account existing research on the effectiveness of shadow education in both countries, we can assume that lessons in the shadow education sector are of considerable high quality since these lessons were found to contribute to students' educational achievement (e.g. Guill & Bonsen, 2011; Haag, 2001, 2007; Hosenfeld,

2011; Konakayama & Matsui, 2008; Mimizuka, 2007; Streber, Haag & Götz, 2011; Tomura, Nishimaru & Oda, 2011). A generally higher investment in professional outside of school lessons in Japan thus provides an explanation for the higher achievement rates of Japanese students compared to German students.

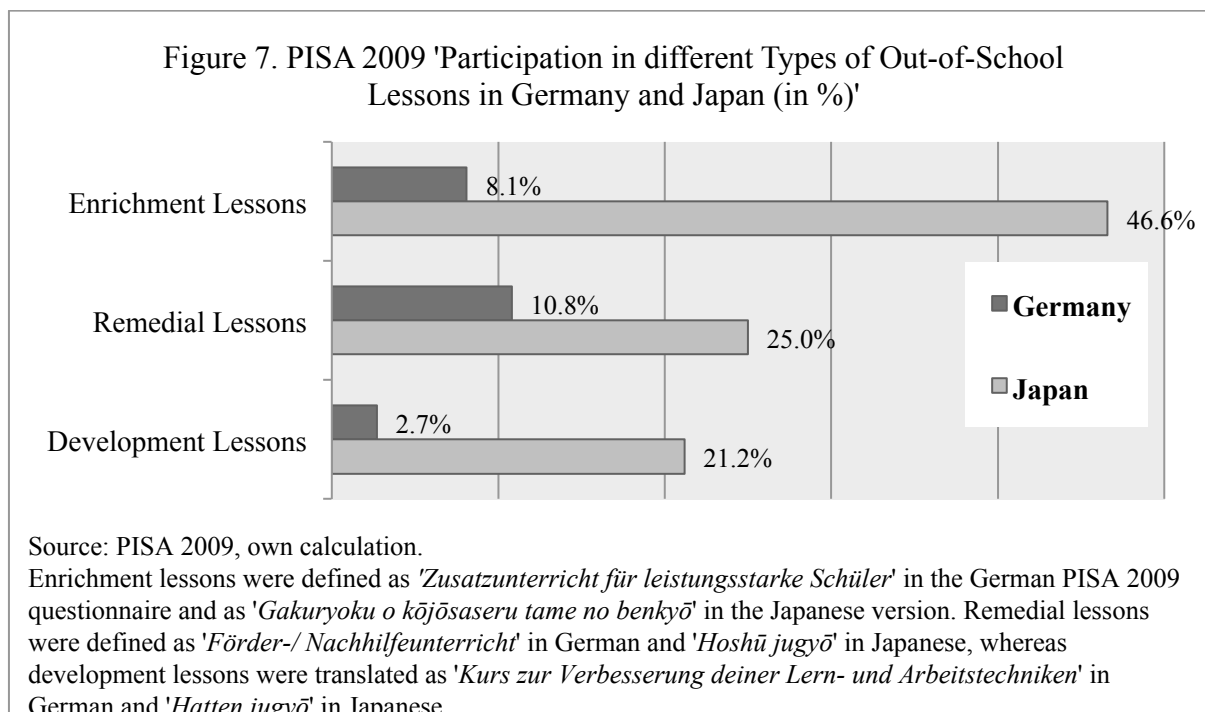


According to PISA 2009 data, Japanese PISA-participants did generally use shadow education more often. As we can see, especially in the three PISA-related subjects native language, science and mathematics (!) classes outside of school are attended to a high degree. However impressive these participation ratios may seem, they only partly reflect reality. Due to definition inaccuracies it is not clear whether 'out-of-school time lessons' as mentioned in the PISA questionnaires are attended in the private or public sector, nor whether or not they have to be paid for. Out-of-school lessons were simply defined as "given at [...] school, at [...] home or somewhere else" (PISA 2009 questionnaire: Q31, Q32). The extraordinarily high participation ratios in out-of-school lessons in PISA 2009 are

thus due to definition inaccuracies. Here not only shadow education was included into students' responses, but unpaid and paid lessons in and outside of school, too. Contrary to this, the items in German were more accurate.

Nevertheless, these data show that Japanese students are extensively engaged in extracurricular education, whereas this seems not to be the case in Germany.

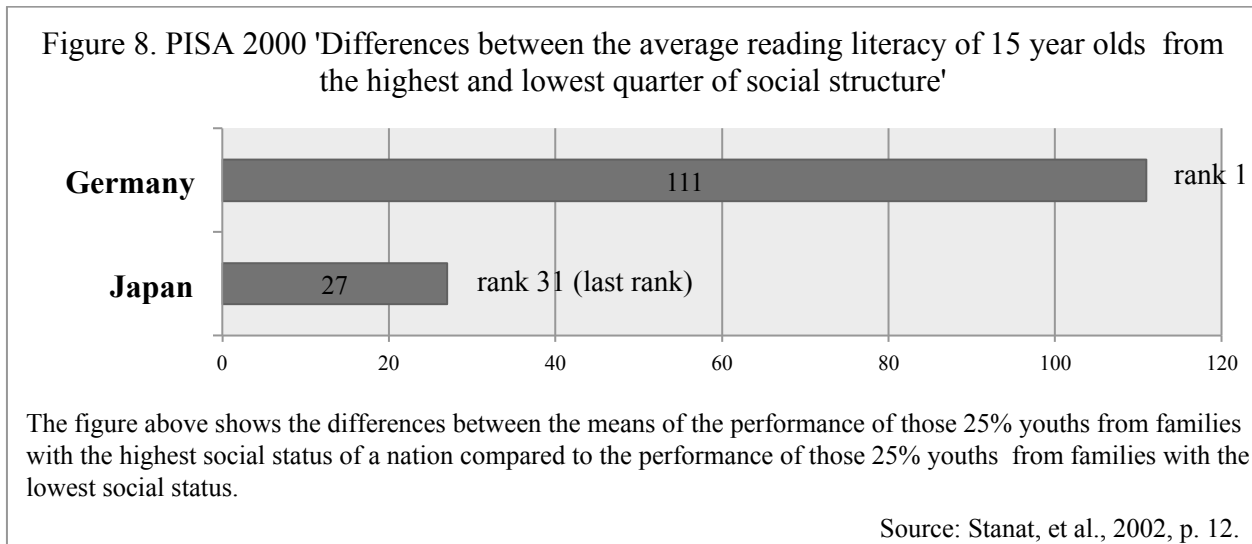
Whether an investment in out-of-school lessons shows effects on the performance in large scale assessment studies such as PISA depends somewhat on the type of lesson the students attend (Mimizuka, 2007). In PISA 2009, three different types of out-of-school lessons were defined: enrichment, remedial, and lessons to improve students' study skills (development lessons). Whereas enrichment lessons are used with the purpose to enhance the individual academic achievement level above the school class level, remedial lessons are used by students with learning deficits. Development lessons provide techniques to increase the students' individual learning ability. As Figure 7 shows, Japanese students use more out-of-school supplementary education of all types.



In general, the demand for remedial lessons is slightly higher in Germany, whereas Japanese students favor enrichment lessons. Especially the high percentage of Japanese students participating in enrichment lessons (46.6%) compared to German students (8.1%) supports the argument that shadow education contributes to the Japanese success in PISA, since enrichment lessons are mainly used by students without learning deficits who aim at enhancing their academic achievement level above the original requirements of regular school class.

Social Origin and Educational Achievement

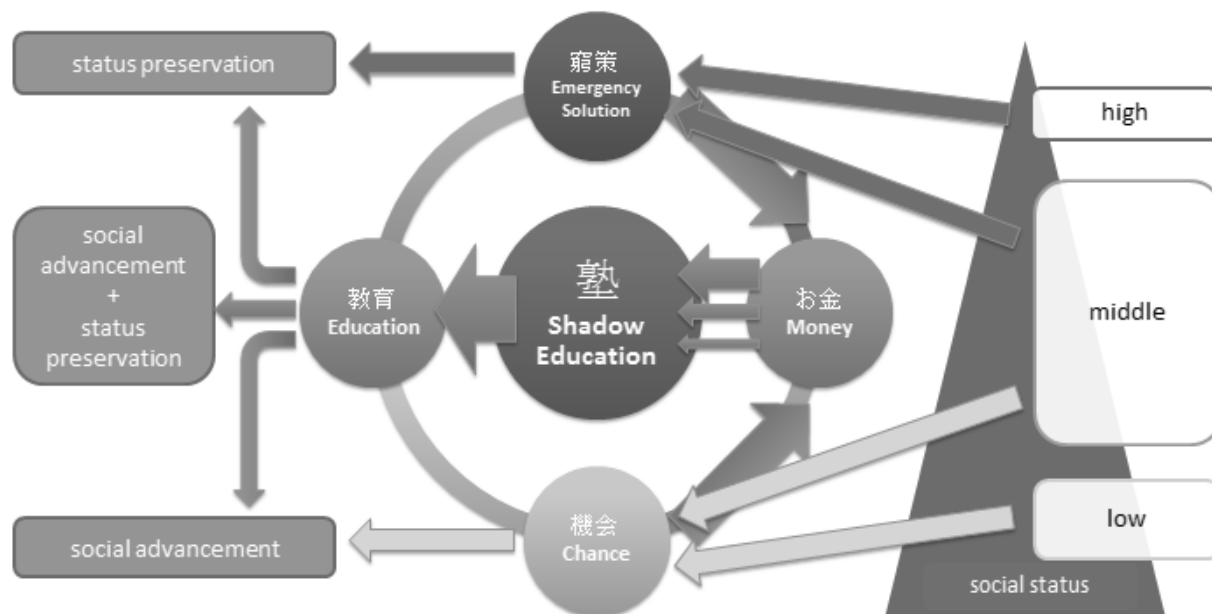
Besides the only mediocre results of German students in PISA 2000, it became clear that the social origin of a student plays a significant role for the level of educational achievement in Germany. In Japan the correlation between social background and educational achievement was comparably low (Figure 8).



Here the range between the performance of students of the highest and lowest social quartile of society was the lowest in Japan (27 points), but highest in Germany (111 points) in 2000. Even though Japanese education is believed to have become more unequal recently (Fujita, 2010), Japan is still one of the countries in which the impact of social origin on student performance remained considerably low in international comparison. For the German case, the influence of social background on performance in PISA 2009 seems was not as strong as it used to be in 2000, but there still remains a big difference in comparison to the Japanese case. In Japan about 11% of resilient students can be found among the 25% of those youths from families with a low social status. Germany still belongs to the countries where students' learning outcomes are strongly determined by their social origin (OECD, 2012, p.49). The reason for the nevertheless apparent improvement in Germany may be a result of reform measures undertaken in the different federal states of Germany. Also the increased use of shadow education may play a great role here. The lower range of performance in Japan may be caused by the higher use of shadow education in all social quartiles. Especially students with disadvantaged social origin may indeed be the ones to use out-of-school education as a means to counteract their family background. Following leading sociological theories,

Figure 9 illustrates what causes may underlie the motivation of different social classes to invest in shadow education.

Figure 9. Social Status and Shadow Education



In Figure 9, possible causal relationships are visualized theoretically before they will be translated into our data analysis. Following decision theory based on Boudon (1974) and further developed by Esser (1999) and Breen and Goldthorpe (1997), families with a high social status are trying to preserve their status. To achieve this goal a high level of education has to be guaranteed for their children. Whether the school seems to not prepare their children enough for a successful life course or the children's grades are not what they ought to be, parents may be concerned in one way or the other. Therefore measures have to be taken to assure a high status. Here shadow education, although it may seem as some kind of emergency solution, can serve as possible guarantor for educational success. The expenses for this supplementary education seem to be tacitly approved by those parents. In comparison, families with a low social status have the greatest opportunities in education.

However, those families may not realize the importance of a high level of education, because they might just not realize the chance of social advancement. But even if they realize how important education can become for their children, they might not have the financial resources to take the opportunity that shadow education may provide for them. Whether shadow education is accessible for all social strata will be discussed in the following chapter.

In contrast, middle class families have to worry about status preservation so they will not slide down the social ladder on the one hand or grab the opportunity to climb the social ladder on the other. Again education is the crucial factor for both scenarios. It becomes clear, how influential primary as well as secondary effects of social origin are for educational pathways. Here shadow education can advance to become a chance to at least preserve the social status or even climb the social ladder. Of course parents are also measuring if further investments in education will pay off in the end (Becker & Lauterbach, 2010, p.15ff.).

To make conclusions about the ability as well as the willingness of parents to invest in shadow education in Japan and Germany, similarities and differences in Japan and Germany regarding the investment in shadow education have to be taken into account. The research questions are: Does the social origin play a role in who utilizes out-of-school classes in the two countries? Are all Japanese students able to utilize out-of-school education regardless of their social origin? Some answers shall be given in the next chapter.

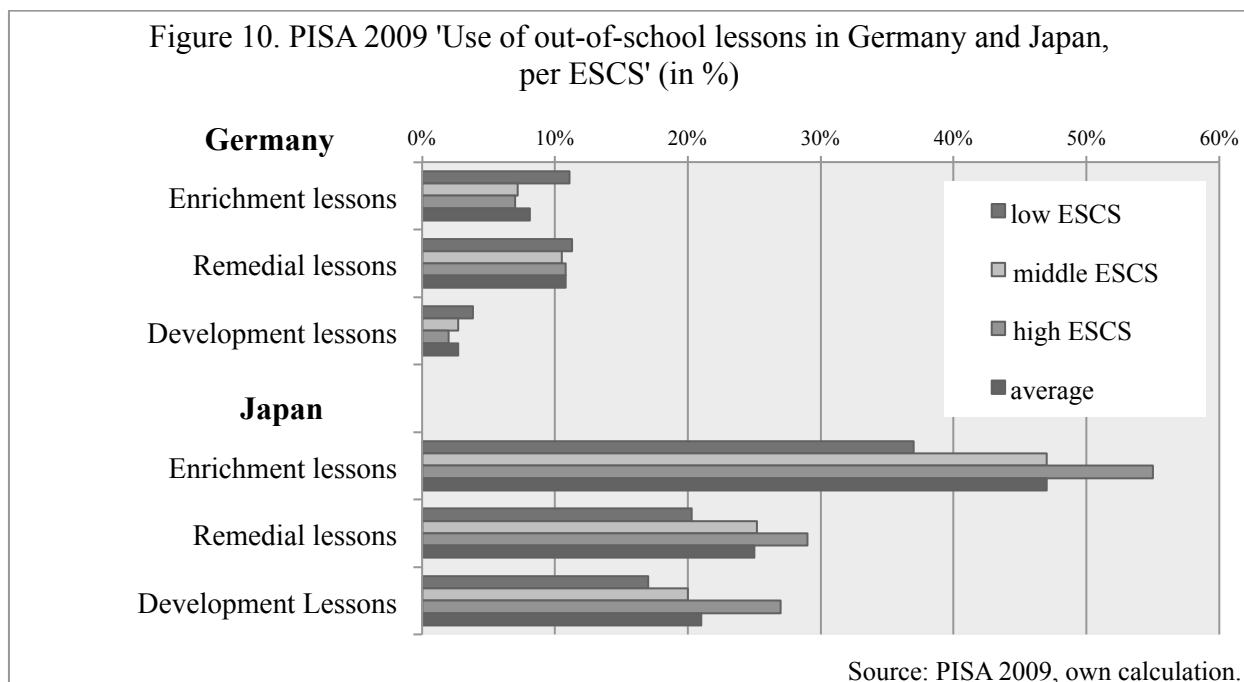
Shadow Education as a Means to Counteract Social Disadvantages?

To verify my theoretical assumptions, I will use PISA data of the year 2009. In order to carry out my analysis, besides the dependent variables concerning the participation in shadow education, suitable

covariates to describe the socioeconomic background of German and Japanese students will be introduced in the following.

PISA includes a great variety of background data, such as the index of the economic, social and cultural status (ESCS). The ESCS index was derived from PISA variables which are all related to family background: the highest parental education in years (PARED); the highest parental occupation (HISEI); as well as the number of home possessions (HOMEPOS). The variable HOMEPOS was used as an approximate measure of family wealth (OECD, 2006, p.316). For our further research all data was weighted to get unbiased estimates of population parameters. To categorize the ESCS variable, it has been subdivided into three social classes: lowest 25% (lower class), highest 25% (upper class), and the 50% in between (middle class).

Figure 10 shows the distribution of German and Japanese students who are participating in out-of-school lessons according to social strata. Surprisingly, the greatest differences in the participation in out-of-school education for different social strata are detected for Japan (Figure 10). Although all Japanese students use shadow education far more than German students, it seems as if an investment in shadow education increases with higher socioeconomic status of students. In comparison, in Germany more lower class students attend *Nachhilfe*-classes. Especially enrichment lessons are attended by more low class students (11.1%) than high class students (7%) in Germany. In contrast, remedial lessons are nearly equally used by all students (about 11%).



Although a high percentage of Japanese students is able to use shadow education, it seems as if social strata have a greater impact on who uses shadow education in Japan than in Germany.

To get reliable results, I carried out several logistic regression analyses using the three different types enrichment, remedial and development lessons in mathematics as dependent variable, as shown in Tables 2 and 3.

First of all, model 1 (Table 2) only includes the ESCS of students as explanatory variable. In general, both countries show similar results: students with a high ESCS have much higher chance to participate in out-of-school lessons of all types, except for remedial lessons in Germany – the participation in these lessons is only marginally affected by students' socioeconomic background. German students with a high ESCS are even less likely to receive extracurricular remedial teaching. However, the pseudo R square of these models is far from satisfactory, meaning that there are several other influences of greater importance than the socioeconomic status of a student.

Table 2. PISA 2009 ‘Logistic Regression Analysis predicting Students’ Participation in Different Types of Out-of-School Lessons in Mathematics (Odds Ratios)’ *Model 1*

	Enrichment Lessons		Remedial Lessons		Development Lessons	
	Exp(B)	Prob	Exp(B)	Prob	Exp(B)	Prob
	GERMANY					
ESCS						
High	1.766	***	.866	***	1.611	***
Middle	1.238	***	1.093	***	1.233	***
Low (ref.)						
Constant	.093	***	.231	***	.020	***
N (weighted)	628560		628679		625884	
R ² : Cox & Snell	.004		.001		.001	
Nagelkerke	.008		.002		.003	
	JAPAN					
ESCS						
High	2.081	***	2.069	***	2.296	***
Middle	1.518	***	1.478	***	1.374	***
Low (ref.)						
Constant	.586	***	.351	***	.288	***
N (weighted)	1102710		1103432		1103015	
R ² : Cox & Snell	.017		.015		.019	
Nagelkerke	.022		.020		.027	
***P<0.001; **P<0.01; *P<0.05						

Source: PISA 2009, own calculation.

To increase the model fit of my analysis, further influential variables have to be considered, which determine the access to shadow education. Following Ojima and von Below (2010), students' currently attended type of school is considered as one of the most influential covariates besides ESCS.

In Germany basically we find a tripartite tracking system, consisting of the three secondary school tracks *Gymnasium*, *Realschule* and *Hauptschule*. While the *Gymnasium* is the only track that traditionally provides the opportunity to get access to universities through the *Abitur*, *Realschule* graduates have access to white collar jobs and other higher education fields. *Hauptschule* students nowadays do not have as much access to higher education, well paid or prestigious jobs (Ojima & von Below, 2010, p.277). Today the number of comprehensive secondary schools, the *Gesamtschule*, is also increasing. At a *Gesamtschule* students also have the opportunity to get an *Abitur* and therefore access to universities. Nevertheless, this school type is not yet a competitor for the tripartite system (Maaz, 2006, pp.85-87).

In Japan a single track secondary school system is found. Here all senior secondary school graduates have the opportunity to access all different higher education institutions. However, two major tracks can be divided though: a general academic (*futsūka*) and a vocational track (*senmongakka*). But, the Japanese academic high school system is also highly stratified through the prestige high schools have gathered according to the percentage of students that enter high ranked universities (Ojima & von Below, 2010, p.277). To access these universities, solely performance counts, since entrance examinations remain the deciding factor for entering (Takeuchi, 1997, p.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. Besides, we find a vocational school track.

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

When including the school type into our analysis, the impact of students' ESCS decreases heavily (Table 3).

Table 3. PISA 2009 'Logistic Regression Analysis predicting Students' Participation in Different Types of Out-of-School Lessons in Mathematics (Odds Ratios)' <i>Model 2</i>						
	Enrichment Lessons		Remedial Lessons		Development Lessons	
	Exp(B)	Prob	Exp(B)	Prob	Exp(B)	Prob
GERMANY						
ESCS						
High	.899	***	.895	***	.919	***
Middle	.886	***	1.095	***	.934	**
Low (ref.)						
School Type						
Gymnasium	.244	***	1.071	***	.361	***
Realschule	.495	***	1.172	***	.700	***
Gesamtschule	.659	***	1.095	***	.572	***
Hauptschule (ref.)						
Class	.680	***	1.096	***	.482	***
Constant	.291	***	.203	***	.051	***

N (weighted)	628560		628679		625884	
R ² : Cox & Snell	.031		.002		.006	
Nagelkerke	.062		.003		.032	
	JAPAN					
ESCS						
High	1.521	***	1.521	***	1.756	***
Middle	1.291	***	1.224	***	1.206	***
Low (ref.)						
School Type						
General A	2.256	***	2.484	***	2.392	***
General B	1.569	***	2.867	***	1.472	***
General C	1.030	***	1.847	***	1.273	***
Vocational (ref.)						
Constant	.521	***	.214	***	.235	***
N (weighted)	1102710		1103432		1103015	
R ² : Cox & Snell	.035		.045		.034	
Nagelkerke	.047		.062		.048	
***P<0.001; **P<0.01; *P<0.05						
Source: PISA 2009, own calculation.						

A high ESCS has no impact on the participation in either one of the three types of out-of-school lessons in Germany anymore. In comparison, even though the chance that Japanese students participate in out-of-school lessons has decreased also, there is still a 1.5 times (enrichment and

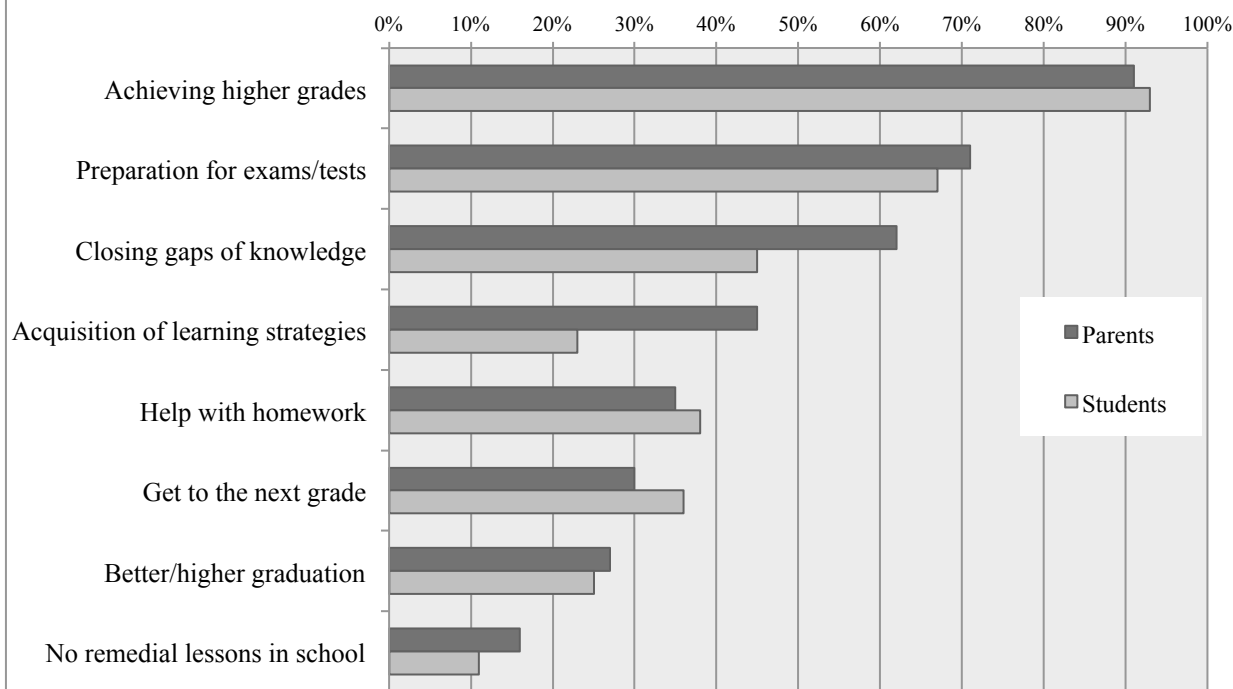
remedial lessons) to 1.8 times (development lessons) higher chance of students with a high ESCS to participate in shadow education compared to students from the lowest social quartile.

In conclusion, we have to acknowledge these first results. The German shadow education is functioning more as an instrument to neutralize disadvantaged family background than Japanese shadow education. Although this would also be a very positive result of this investigation, there are other factors we have to consider before jumping to final conclusions.

Discussion

An explanation for the great class specific differences in the use behavior regarding shadow education between the two countries can be found in the different motives why out-of-school lessons are attended (Figures 11 and 12).

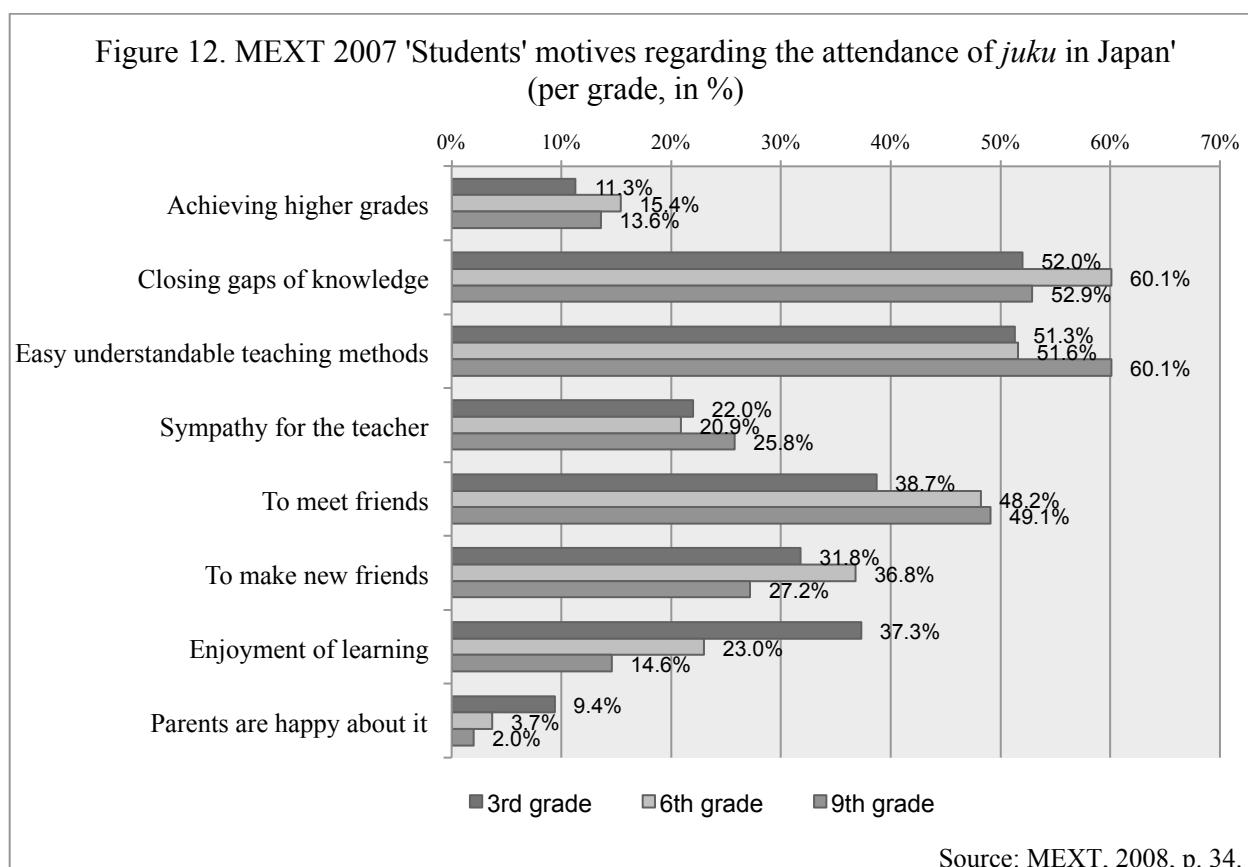
Figure 11. Studienkreis 2003 'Students' and parents' motives regarding the attendance of *Nachhilfe*-center in Germany' (in %)



Source: Jürgens & Diekmann, 2007, p. 31.

Following the data of a survey conducted by one of the two biggest German *Nachhilfe*-providers, the *Studienkreis*, which owns more than 1.000 *Nachhilfe*-center in Germany, it is the foremost objective of German parents as well as students to get better grades. Most German students seem to attend out-of-school lessons because they have a certain problem at school. Besides getting better grades, they seek to close gaps of knowledge or get help with preparations for school tests or with homework.

In Japan it is entirely normal for a child to go to a *juku*. Especially in middle school (7th to 9th grade) nearly everybody goes to a *juku* in the afternoon or evening. As the next Figure (12) shows, Japanese students have also very different reasons to attend a *juku*.



In comparison to German students, where nearly everybody uses shadow education to get better grades (91%), just a mere 11% to 15% of Japanese students use out-of-school lessons to achieve

higher grades in school. It is of nearly equal importance to close gaps of knowledge. Besides, particularly the better teaching methods play a role for attending a *juku*. In addition, more social aspects seem important to Japanese students, too. Almost every second student (6th and 9th grade) intends to meet friends or make new ones (up to 37% in 6th grade) by attending a *juku*.

Based on sociological cost-benefit-assessments the assumption that those motives are also determined by social origin make a lot of sense (Becker & Lauterbach, 2010, pp.15-17). While wealthier parents can easier afford to send their children to *juku* the more disadvantaged families may not. Considering the nevertheless high attendance ratio of lower class students in Japan, it becomes clear that lower class students will not be able to attend a *juku* because they want to meet their friends or something like that, but because they need a certain kind of education. Here, parents decide to send their children to a *juku* because they assume that this is an investment worth being given (secondary effect of origin). This would also explain the low achievement gap between students of higher and lower social status in Japan, which was verified by PISA (OECD, 2012).

Conclusion

Although comparable school instruction time is found in Germany and Japan, Japanese students achieve constantly higher results than their German peers. The assumption that the reason therefore lays only within quality differences between the school instructions in the two countries is not sufficient enough. Here the Japanese shadow education system provides a reasonable explanation for those higher achievement rates. As could be shown, Japanese 10th grade students are much less influenced by their family background in achieving educational success than their German counterparts. Also, Japanese students of all social classes invest in shadow education to a high degree. This means, shadow education may indeed be used to counteract disadvantaged family background – although with some restrictions.

On first sight, the influence of the social origin of a student seems to be much stronger in Japan than in Germany. Different educational aspirations of social classes as well as financial resources also play a role for the shown differences between low and high ESCS groups in Japan. When it comes to quantity, students of low ESCS cannot compare with those of higher ESCS. But it seems as if lower class students just invest in essential classes to get an education as good as the more advantaged students. This would explain the high percentage of resilient students in Japan (about 11%). From this perspective, shadow education can indeed function as possible instrument to counteract social disadvantages. In Germany the social origin of a student does not seem to play a great role in who uses shadow education and who does not. Students from lower classes do even invest slightly more for supplementary education. Nevertheless, the small difference in the amount of use as well as the comparatively low attendance ratio is not yet sufficient enough to be a cause for a decrease in disparities.

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