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Widening Educational Disparities Outside of School: A longitudinal study of parental involvement and early elementary schoolchildren's learning time in Japan[1]

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Abstract

This study attempts to further our understanding of social-class-based differences of school-aged children's effort levels by shedding light on the beginning of the inequality. Using four waves (from 1st to 4th grade students) of the Longitudinal Survey of Babies in the 21st Century collected in Japan, this study investigates how the effort gap emerges and widens in the first four years of compulsory education. The results of hierarchical linear model (HLM) growth curve analyses indicate that college-educated parents demonstrate "concerted cultivation" (Lareau 2003, 2011). Parental education background, a proxy of social class, relates to the usage of shadow education (i.e., cram schools and long distance learning), the length of a child's time spent on television viewing/video gaming, and the degree of parents' involvement in the child's learning at home. Findings of a hybrid fixed effects model show that these social-class-related parenting practices are associated with the levels and changes in children's learning time.

Keywords: Learning time, Effort, Social class, Parental involvement, Shadow education, HLM growth curve model, Hybrid fixed effects model
JEL classification codes: I10, I20

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Introduction

In a meritocratic society, an individual's merit is regarded as a combination of their ability and effort (Young 1958). How much effort one exerts is, however, under the influence of individual and school-related factors such as family socioeconomic status (SES) and ability grouping/tracking, according to studies on effort (e.g., Carbonaro 2005, Kariya 2000, 2013). While most of these studies have revealed relationships between students' effort (e.g., self-reported learning time), SES and school-related factors (e.g., tracking or course-taking pattern) by using lower and upper secondary education data, how the effort gap emerges and widens in the first four years of compulsory education has not been researched. This study therefore attempts to further our understanding of effort-level differences based on one's social class by shedding light on the beginning of the inequality. Using four waves (from 1st to 4th grade students) of the Longitudinal Survey of Babies in the 21st Century collected by the Japanese Ministry of Health, Labour and Welfare between 2001 and 2011, the study investigates how early elementary school aged children's learning time is formed through assessing social-class related parenting practices that would structure outside-school learning time.

The Japanese context is distinctive in that it helps add new insights to processes of social reproduction, since social-class differences in parenting practices are considered to be the major source of inequality in educational attainment. Unlike the United States, between-school differences are small at the level of elementary education in terms of student demographic, financing level and teacher-qualification (e.g., Cummings 1980) in Japan, meaning that students who attend public schools (about 99% of the population) receive indifferent learning experiences from schools.[3] Thus, the achievement gap along socioeconomic lines likely emerges outside of school, based on social class-differences in parenting practices including whether to use outside-of-school educational services. Given this context, this study assesses how early elementary school aged children's learning time is shaped in order to reveal how parental advantages/disadvantages are transmitted to their children through outside-of-school education.

Studies on learning time in Japan

Arguably, Kariya's study (2000, 2013) is the most influential in the study of learning time in Japan. He argues that even though individuals' self-learning time can be considered as a sociological index to represent their effort, no previous studies have been conducted to investigate the association between students' family background and their level of effort in learning. Kariya's study on high school students' learning hours outside of formal schooling indicates considerable differences in the length of self-studying hours depending on students' SES and high school ranking (tracking position). Additionally, the mother's educational background was a significant predictor of students' studying hours in 1997, while it was insignificant in 1979, suggesting students' social class came to play a greater role in shaping their learning hours outside of school between the two points of time (Kariya 2000, Kariya and Rosenbaum 2003). Other than Kariya's research, only a few studies on students' effort or study habits were carried out in Japan; the effect of SES on effort was found among sixth graders (Kaneko 2004, Otawa 2008), junior high school students (Koyama 2011, Origuchi 2008), high school freshmen (Matsuoka 2013a) and high school seniors (Aramaki 2002). These studies reveal the relationship between SES and effort at the various stages of education. While all of them use cross-sectional data, no study has ever been conducted on early elementary school-aged children

[3] To verify this point, intra-class correlation (ICC) was estimated using fourth-grade dataset of Trends in International Mathematics and Science Study, known as TIMSS, administrated in 2011. The results showed that only about 5% of variation in math achievement exists between elementary schools in Japan, while it is about 30% in the United States, implying greater disparities between U.S. schools.

to assess if the effort gap exists at the point of entry into compulsory education and whether it widens over the years.

Social class and parental involvement

Parenting practices need to be considered to understand who spends longer time studying in the early years of elementary education, as parents are likely to play a greater role in managing their child's time outside of school. In the prominent study of social class disparities in parenting, Lareau (2003, 2011) coined the term "concerted cultivation," that is, a cultural logic of parenting practices that middle-class mothers follow; these mothers structure their children's daily life. More specifically, they tend to schedule children's time outside of school with extracurricular activities, emphasize the importance of language use by reasoning with their children, and engage in active interactions with social institutions like school so as to develop their children's cognitive and social capabilities. In the meantime, working-class mothers follow the "accomplishment of natural growth," that is, a logic that stresses children's development without rigorous guidance; these mothers are less likely to structure children's time, use directive language with their children, and tend to avoid interactions with social institutions. These differences in parenting practices contribute to children's different levels of engagement in structured activities and result in the achievement gap, reproducing social class disadvantages for the working class and advantages for the middle class (Lareau 2003, 2011). Studies analyzing longitudinal U.S. data empirically support Lareau's qualitative findings. More specifically, strong relationships between social class and parenting style (i.e., concerted cultivation) were found for elementary school years (Bodovski 2010, Cheadle and Amato 2011).

Building on Lareau's study, by interviewing parents at two urban middle schools, Bennett, Lutz and Jayaram (2012) also found differences in participation in school activities between middle-class and working-class youths. Middle-class parents tend to customize children's participation in extracurricular activities in order to develop their talents and interest, while working-class parents emphasize safety. In addition, working-class children are involved in fewer non-school-related activities. These social-class-based differences are derived from financial and institutional constraints; that is, disadvantaged parents have less access to institutions besides school and church (Bennett, Lutz and Jayaram 2012). This line of argument parallels the ethnographic study by Chin and Phillips (2004) that reported social-class differences in terms of the quality and quantity of fourth grade children's participation in activities during summer, and then argue that these disparities stem from parents' different levels of access to various resources (e.g., network and money).

As for studies carried out in the Japanese society that this study investigates, relationships between social class and parental involvement and strategies (e.g., Kataoka 2001) and between social class and child rearing (e.g., Kanbara and Takata 2000) have been reported. While these studies attempt to reveal each specific relation (i.e., whether parenting practices are different by social class), Honda's (2008) study assesses the relationships between SES, parenting practices and educational outcomes by following Lareau's study. Interviews were conducted with 39 mothers whose children attended elementary schools (from fourth to sixth grades) and then a nationwide survey data of youth (from 15 to 29-year-olds) and their mothers (1890 pairs) was analyzed. Findings of the study indicate that mothers with a college education have higher educational expectations for their children, actively intervene in their children's home education and intensively use shadow education services (e.g., lessons at *juku* that require tuition), while the mothers without a college education are less likely to employ these strategies and tend to carry out home education "naturally." These differences in parenting practices seem to parallel Lareau's observations of "concerted cultivation" practiced by middle-class mothers and "accomplishment of natural growth" followed by working class mothers (Honda 2008). In addition, according to the study's quantitative analyses of mothers' retrospective responses regarding their child-rearing practices when their child attended elementary school, higher

SES mothers are more likely to demonstrate parenting practices of various aspects. More concretely, they engage in "rigorous" child-rearing (i.e., enforcing discipline at home, having high expectations for their children's academic performance and using shadow education services) and "natural" parenting (i.e., listening to children's wishes, letting their children play outside and obtain various sorts of experiences), while these advantaged mothers engage in the former style more than lower SES counterparts. Another recently conducted study by Sugihara (2011), using data from four cities, also reports differences in mothers' parenting practices (e.g., giving a number of picture books to their children) contingent on mothers' educational background. More concretely, she found differences in the usage of shadow education enrichment-lessons, the length of learning minutes, and education expense, depending on both the mothers and fathers' educational qualifications when the children were at the fifth-grade-level in Tokyo.

Considering the context of Japanese education, it is critical that Honda (2008) considers the usage of shadow education as parts of a "rigorous" parenting style, which is close to Lareau's "concerted cultivation" in relation to organizing extracurricular activities for children. Prior studies (e.g., Kaneko 2004, Holloway et al. 2008, Matsuoka 2013b, Yamamoto and Brinton 2010) show that a family's SES influences children's shadow education participation (e.g., *yobiko* and *juku*) in Japan.

Effects of parental involvement

Lareau (2003, 2011) argues that the differences in parenting between middle-class and working-class mothers contribute to different levels of children's engagement in structured activities and these disparities lead to an achievement gap and different life trajectories; the social-class parenting differences reproduce advantages for the middle class and disadvantages for the working class (Lareau 2003, 2011). Other studies also indicate that parental involvement (PI, hereafter) relates to a wide range of educational outcomes: academic performance (e.g., Hill and Tyson 2009), problem behaviors (e.g., Domina 2005; El Nokali, Bachman and Votruba-Drzal 2010), junior high school students' placement in ability groups (Useem 1992), intrinsic motivation and self-efficacy in English and mathematics (Fan and Williams 2010), school persistence of upper secondary education students (e.g., McNeal 1999) and major-choices in college (Ma 2009), while definitions and measurements of outcomes differ from study to study. Effects of PI are, however, not conclusive; Domina (2005) contends that findings of studies on PI effects have been inconsistent at middle and high school levels, while his analyses using longitudinal data find that some aspects of PI (i.e., parents volunteering at school and helping/checking their child's homework) prevent children's behavioral problems at the elementary school level. In addition to how PI and educational outcomes are measured, effects of PI seem to vary greatly based on grade level. As for the usage of shadow education services (one type of PI, especially in East Asia), parental efforts of selecting and monitoring private tutoring services relate to middle school students' performance in math and English in South Korea (Park, Byun and Kim 2011).

Studies conducted in Japanese society also indicate PI effects on some aspects of educational outcomes. More specifically, Uzuki (2004) shows that mothers' approaches to education affects fifth and sixth graders' learning hours, and mothers' expectations for educational accomplishment influences children's aspirations for higher education. Uzuki (2004) contends that parents' daily child-rearing approach and high expectations for their children are meaningful. In addition, Koyama (2011) reports that mothers' active approaches before their children entered junior high schools influence second year junior high school students' learning time during weekdays and holidays. In addition, Honda (2008) attempts to find relationships between the two styles of parenting and diverse kinds of outcomes by analyzing the mother-child pair data. The results of multiple regression analyses show that the "rigorous" parenting, which parallels with "concerted cultivation," is related to children's academic performance in the ninth grade, which, in turn, is associated with whether they continue for four years or longer in higher education. This educational

achievement also relates to whether they became employed full time, leading them to receive a higher income (Honda 2008). Because of these relationships, Honda (2008) contends that the "rigorous" parenting during children's elementary school years is critically important, since it shapes children's academic achievement in the ninth grade that subsequently affects their educational and occupational trajectories. Furthermore, other studies (e.g., Katase and Hirasawa 2008) show that parental strategies (i.e., whether purchasing the shadow education service when their child was at the ninth grade level) is associated with later educational achievement.

Rationale for this study

As a whole, the literature indicates the relationship between social class and parenting styles (e.g., Lareau 2003, 2011), and some parenting practices appear to have positive impacts on educational outcomes in the United States. The same argument could be made for Japan, but methodological issues of the literature, more specifically data limitations, should be addressed. The studies carried out in Japan that assess associations between social class, parenting styles and some aspects of educational outcomes use regional and/or retrospective cross-sectional data that do not capture changes in parental involvement and outcomes. This makes it especially difficult to assess effects of PI, while the findings of the literature are plausible as they are mostly consistent with U.S.-based research. In addition to the methodological issue, no connection between actual parenting practices and students' learning time in the early years of elementary education has been addressed, although specific types of parental involvements likely facilitate/encourage students to study regardless of their grade level. Moreover, while studies on learning time as a proxy of effort show the relationship between students' SES and their learning time outside of school, when and how the effort gap emerges and widens has not been previously addressed. The SES effect on students' learning time might occur before they enter secondary school[4], as study habits are likely to be internalized during early years of education through family socialization. The statistical association between SES and learning time may imply that the internalized values/habits derived from childhood experiences have influence on their learning time at the secondary level than their SES.

To overcome these points, this study uses unique longitudinal data and investigates (1) whether social class-related parenting practices are associated with early elementary school-aged children' learning time and (2) whether its trend persists over time, revealing when and how the effort gap emerges and widens in the society where the intergenerational transmission of advantage is mainly through parental involvement in child's education and educational activities outside of school. This unique context provides a special case in the field of social reproduction research; the purpose of this study is to reveal the advantaged and disadvantaged parents' strategies as well as the consequences of disparities in parenting practices in a society with a centralized and relatively equal education system.

It should also be emphasized why it is important to study the inequality in effort, especially, in the context of Japanese society. In his prominent study on high school students' learning time, Kariya (2000, 2013) contends that while a meritocracy presumes that "merit" (ability and effort) is not affected by given conditions like parents' social class, disparities in educational attainment are partly derived from the amount of effort that is influenced by students' background. Even though hard work is embraced more than ability in Japan, social-class differentials in effort exist; the disparities in educational attainment are not solely consequences of differences in ability, but with

[4] Carbonaro (2005) studies associations between tenth grade students' effort (i.e., student behaviors observed by teachers in the 10th grade), tracking position, and academic achievement through a series of analysis of National Education Longitudinal Study of 1988 (NELS:88), and one of his analysis shows that prior effort measured in the 8th-grade partly explain SES-differences in effort at the 10th grade level. This implies that SES-inequality in effort emerged before students entered secondary education.

hidden influences of social class through the disparities in effort (Kariya 2000, 2013). As the meritocracy in Japan presupposes that ability is equal regardless of social class origin and effort is "entirely a matter of individual freewill" (Kariya 2013:127), if the influence of social class on disparities in effort is not considered, the relationship between social class and educational attainment would be obscured (Kariya 2000, 2013); successful educational attainment would be regarded as a result of effort and ability, justifying consequences of the selection process as meritocratic. Building on this rationale, this study will add insights to when and how class differentials in effort merge and widen, which would partly explain the disparities in educational attainment along socioeconomic lines. In addition to Kariya's argument, it should also be highlighted that it is important to investigate whether parenting practices that differ by SES relate to the amount of effort that early elementary school-aged children exert in our time, since neo-liberal policies are becoming prevalent in a number of societies including Japan (e.g., school vouchers are proposed at prefectural levels). These policies presume that individuals make their own choices and should be responsible for the consequences of their choices despite social-class disparities in parenting practices and effort.

Research questions and hypotheses

The primary purpose of this study is to unpack when and how the effort gap emerges and widens. For this aim, the study first assesses disparities in parenting practices, as these are likely to shape children's learning time outside of school. Thus, the first research question is as follows; is there a link between parents' social class and levels and changes in their parenting practices?

Levels here mean between-individual differences and changes refer to within-individual differences (growth) in each type of parenting practices that the study assesses. For this part of the study, it is hypothesized, as the literature indicates, that parents engage differently in their child's education outside of schools; advantaged parents tend to organize and manage their child's time including extracurricular activities. In other words, highly educated parents tend to demonstrate a parenting style that is consistent with Lareau's "concerted cultivation" (2003, 2011) and "rigorous" parenting (Honda 2008). More specifically, parental education is hypothesized to positively relate to levels and changes in *juku*-participation and long distance learning use, as the literature with cross-sectional data (Honda 2008, Sugihara 2011) shows that highly educated parents tend to use shadow education services. In addition, parents with a college education are presumed to monitor/supervise their children's hours spent on television and games; parental education is negatively associated with levels and changes in hours of television viewing and video gaming per week. Finally, as Honda (2008) found that highly educated parents enforce discipline at home, parental education is assumed to positively relate to levels and changes in each parent's involvement in a child's learning at home.

After clarifying the relationships between parental education and parenting practices, the study then asks the main research question; are parenting practices associated with levels and changes in child's learning time? This study hypothesizes that parenting practices relate to levels and changes in child's learning time, since parents would have influence over how early elementary school-aged children spend their time outside of school. This could be inferred from the studies by Uzuki (2004) and Koyama (2011); mothers' active interventions/approaches toward their child's education relate to learning time during fifth and sixth grades' (Uzuki 2004) and of second year junior high school students' (Koyama 2011).

Data

To investigate when and how the effort gap emerges and widens, this study utilizes the Longitudinal Survey of Babies in the 21st Century, which includes ten waves of national data

collected by the Japanese Ministry of Health, Labour and Welfare between 2001 and 2011. This longitudinal survey targets 53,575 Japanese babies who were born between January 10–17 and July 10–17, 2001. As no seasonal or systematic pattern in the population of births is indicated in the monthly Vital Statistics collected by the Ministry of Health, Labour and Welfare, the data is considered to be representative. The respondents of the survey were primary caregivers, mostly mothers. From Wave 1 through Wave 6, the survey was conducted at 6 months postpartum as of August 1, 2001 and February 1, 2002, respectively. One and a half years after Wave 6, subsequent waves (Wave 7-10) were administrated on January 18 and July 18, meaning that the subjects in these waves reached school age in the same grade (from first grade to fourth grade) at the time of the survey.[5]

Each wave's response rate is about 90% on average. About 73% of the initial sample (Wave 1) completed the survey of Wave 10; the response rates of the waves remained high. In addition to this relatively low level of attrition, in a study using the same data, Kitamura (2013) contends that attrition bias could be considered as minor.

This study uses the data of four consecutive waves from Wave 7 through Wave 10 that include responses to detailed series of questions on parenting practices and children's learning time outside of school. The sample is restricted to children whose parents are both Japanese, since immigrants' children (.01% of the sample) are likely to attend international or other types of schools that are not under the jurisdiction of the Ministry of Education, Culture, Sports, Science and Technology (MEXT).

Dependent variable

The main repeated measures dependent variable of this study is the length of learning time outside of school assessed by the respondents at four points of times (from Wave 7 to 10). More concretely, the question that the respondents were asked is "How much time does the child normally spend studying outside of school?" One of the following choices was selected by the respondents: "None," "Less than 30 minutes," "30–60 minutes," "1–2 hours," "2–3 hours," "3–4 hours," "4–5 hours" and "More than 5 hours." The responses were re-coded into the median (e.g., 1–2 hours as 1.5): 0, 0.25, 0.75, 1.5, 2.5, 3.5, 4.5 and 5, and then multiplied by seven days; the variable represents how many hours the child studies per week outside of school. It should be noted that this learning time includes the time spent on homework assignments and in paid lessons at shadow education institutions.

Key independent variables

[5] On average, the response rate of each wave is about 90% as indicated in the following table. As about 73% of its initial sample completed and returned the questionnaire of the latest wave, the response rates are relatively high: the low level of data attrition. Kitamura (2013) points out that the attrition bias is not a serious issue of the survey. The reason why some respondents stop returning to the survey is likely be unrelated to their child's development.

	Numbers distributed (a)	Numbers collected (b)	Response rate (b)/(a)
Wave 1	53,575	47,015	87.8%
2	46,966	43,925	93.5%
3	46,897	42,812	91.3%
4	44,837	41,559	92.7%
5	43,559	39,817	91.4%
6	42,187	38,537	91.3%
7	40,598	36,785	90.6%
8	39,261	36,136	92.0%
9	37,932	35,264	93.0%
10	36,989	34,124	92.3%

(Source) Ministry of Health Labour and Welfare

The key independent variables of this study are six types of parental involvement that indicate whether parents demonstrate a parenting style of "concerted cultivation" (Lareau 2003, 2011). The following indicators are time-varying for the four waves and show the degree of parental involvement in organizing children's time and activities outside of school: two types of shadow education participation, hours of television viewing/video gaming and degrees of each parent's involvement in the child's learning. These indicators were first tested as dependent variables to clarify relationships between parental education background (as a proxy of social class) and their degrees of involvement, and then included in the final model to investigate whether the six types of parenting practices relate to levels and changes in children's learning time outside of school.

Shadow education participation: Two variables indicate shadow education participation. One is *juku* (cram schools) participation, and the other is distance learning participation. In general, the tuition for *juku* is more expensive than that of distance learning. Also, as attending *juku* institutions requires physical presence, the time of children who attend *juku* lessons is much more structured compared to that of those taking distance learning, which takes place at home. Those who participate in each shadow education service were shown as 1, and the others not taking the paid education service were coded as 0.

Time spent on television viewing/video gaming: As indicators showing whether parents control/monitor child's time spent on something unrelated to schoolwork, the study creates two time-varying variables: hours of television viewing and hours of video gaming per week. The question regarding television viewing/video gaming is "How much time does the child spend daily watching television (including videos and DVDs) and playing videogames (e.g., console videogames, PC games and portable game device). The respondents were asked to report how long the child spent on each category (i.e., television and games) by choosing eight options like "none" and "less than one hour" for each school day and holiday, respectively. Hours spent on school days and holidays were multiplied by five school days and by two holidays, and then combined together to create "hours of television viewing per week" and "hours of video gaming per week," respectively. These variables are meant to describe the level of parental monitoring on how the child spends time outside of school, specifically, on non-schoolwork.

Parental involvement in home-learning: Each parent's involvement in home-learning (PI Mother and PI Father) was constructed based on responses to four questions regarding their involvement in their child's learning at home, including working on homework assignments. The respondents were asked to rate the level of involvement of each parent for the following four questions; "I tell the child to study," "I make the child decide when to study and adhere to it," "I supervise the child's study time" and "I check whether the child studied." The level of involvement is coded as follows: "often" (2), "sometimes" (1) and "never/almost never" (0). Responses to the four questions were summed into one variable; the indicator for each parent ranges from 0 to 8, showing the relative level of involvement in the child's learning at home.

Control variables

The children's demographic and parents' socioeconomic information are included in all models as control variables.

Gender: female=1, male=0. This is obtained from Wave 1 and included as the child's gender likely changes the six types of PI.

Number of siblings: This is time-varying and obtained from Wave 7 to 10. This also needs to be considered, since it could influence PI, especially a parents' decision to send their child to shadow education institutions that require tuition payment.

Parental education: The variable shows parental education level: both parents are four-year-college graduates or attend graduate schools (coded as 2: 12.1%), one of the parents has a

college degree or a higher degree (1: 30.2%) and neither of them is a college graduate (0: 57.7%).[6] This variable is included in this study as a proxy of social class. This is because parental education has the strongest relationship with social-class related practices like concerted cultivation, while other aspects of social class (e.g., income) have weaker ties to them (e.g., Cheadle and Amato, 2012). It should also be noted that a total household income from Wave 8 and 10 was tested in all the models. Being consistent with the literature that assesses processes of social reproduction, the results did not significantly change when the variable was added; the amount of annual earnings, one major component of economic capital, is not significantly influential over family experiences that parental education, one aspect of cultural capital, shapes. The household income is not included in the models presented in the study, since this variable has a large number of missing values (i.e., about 33% of the data for Wave 8 and 41% of it for Wave 10).

Mother's employment status: Housewife, or not looking for a job, is coded as 1 and the others (e.g., part-time, self-employed, full-time) are indicated as 0. This is included in the analyses because mothers' physical presence at home as housewives likely increases the level of monitoring/supervising how their children spend time outside of school.[7] This is from Wave 7 to 10: time-varying.

Time and "Born in January": these two variables were additionally created as control variables. "Time" ranges from 0 (Wave 8) to 3 (Wave 10) and "Born in January" is a binary variable, indicating children born in January as 1 (6 months older) and those born in July as 0. These should be included in the analyses, since PI and children's learning time likely change, as children become older.

Table 1 shows a summary of descriptive statistics of the variables. Table 2 reports intra-class correlation of each variable; the degree of six types of PIs and the length of learning time outside of school significantly vary between individuals, ranging from 38.19% (distance learning service) to 64.29% (television viewing).

Method

The study first investigates whether highly educated parents tend to demonstrate "concerted cultivation" in the forms of specific parenting practices and whether its tendency persists over time by employing an HLM growth curve model (e.g., Nakazawa 2012, Raudenbush and Bryk 2002,) that includes time-invariant and time-varying variables predicting initial levels and changes in an outcome. Then, the study tests whether the different parenting practices are related to between-individual differences and within-individual differences in learning time outside of school by using a hybrid fixed effects model (Allison 2009) in which time invariant unobserved heterogeneity is controlled for. Since results of the hybrid fixed effects model are identical to those that the fixed effects model produces (Allison 2009, Miwa and Yamamoto 2012), this model helps test whether changes in parenting practices are associated with changes in learning time within individuals (in this case, children), while effects of levels of the parenting practices on learning time are simultaneously estimated.

For this model, time-varying explanatory variables are decomposed into two parts. One part represents between-individual variation in the individual-level variables by adding the means of the predictors at level 2 (between individuals) in order to explain variation of the random intercept. This can help produce better estimates of time-invariant variables in the models (Allison 2009). The other part indicates within-individual variation. Group-centering time-varying predictors at level 1 (individual level) enables one to estimate the time-varying dependent variable's changes over time.

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[6] Both parents' educational attainments were combined in this way to avoid multicollinearity.

[7] Studies (e.g., Kataoka 2009) that assess parental educational strategies show that being a housewife contributes to whether their children attended private/national junior high school.

It should be noted that the number of cases at level 2 (between-individual level) is 34,907; these individuals' data are in all the analyses, as they have at least one response of each variable over the four waves of the survey. One of the advantages of mixed modeling of growth processes is that individuals with partial data can be retained in the analysis, which, assuming missing values are missing at random, is important in ensuring unbiased estimation of model parameters (Hox 2010). At level 1, (within-individual level) there are 122,064 cases in every analysis presented in this paper.

Models estimated

To find the relationships between parental education background (as a proxy of SES/social class) and the six types of parental involvement, a random intercept (between-individuals) and time (within-individuals) model was specified for dichotomous outcomes and continuous dependent variables, respectively. The logistic model was specified to investigate shadow education participation as follows:

Level-1 Model (within individuals)

Probability (Shadow education participation ti=1|πi) = ϕti

log[ϕti/(1 - ϕti)] = ηti, ηti = π0i + π1i(Time ti) + π2i(Housewife ti) + π3i(Number of siblings ti)

Level-2 Model (between individuals)

π0i = β00 + β01(Born in January i) + β02(Female i) + β03(Mean of Housewife i) + β04(Mean number of siblings i) + β05(Parental education i) + r0i, π1i = β10 + β11(Parental education i) + r1i, π2i = β20, π3i = β30

As for the continuous dependent variables (i.e., television viewing, video gaming, PI mother and PI father), the following model was specified:

Level-1 Model (within individuals)

Parental involvement ti = π0i + π1i (Time ti) + π2i(Housewife ti) + π3i(Number of siblings ti) + eti

Level-2 Model (between individuals)

π0i = β00 + β01(Born in January i) + β02(Female i) + β03(Mean of Housewife i) + β04 (Mean number of siblings i) + β05(Parental education i) + r0i, π1i = β10 + β11(Parental education i) + r1i, π2i = β20, π3i = β30

In these models, π0i shows the initial level of the dependent variables for the individual i at Time 0 (Wave 7: first grade level), while π1i represents a linear growth rate for the individual i at the initial wave (Time 0: Wave 7). π2i and π3i are the vectors of the time-varying control variables (i.e., housewife and the number of siblings). The first equation of level 2 is meant to explain the child's initial status (represented by the intercept, π0i). β03 and β04 (estimated means of housewife and the number of siblings) are included to have a more refined estimate of β05 (parental education). The second equation of level 2 that includes the vector of "Parental Education" is to estimate the level 1's "Time" coefficient, π1i, testing the variation in the parenting practices over time. It should be noted that ordinal logistic models were also run for the four continuous PI indicators (i.e., television viewing, video gaming, PI mother and PI father), but results remain the same. Therefore, these variables were treated as continuous.

To investigate whether the parenting practices relate to the child's learning time per week, a random intercept model using the hybrid fixed effects method was created.[8] This model essentially provides empirical evidence of factors that are associated with the dependent variable of between- and within-individuals, generating identical results of a conventional fixed effects model, while estimating effects of time-invariant variables (Allison 2009). For this purpose, all of the time-varying parental involvement indicators were group centered and put in level 1 (within-individual level), and means of the variables are included at the level 2 (between-individual level).

Level-1 Model

[8] "Time" is fixed as it would make the model unstable.

Learning hours per week ti = π0i + π1i (Time ti) + π2i(*juku* participation ti) + π3i(Distance learning service ti) + π4i(television viewing ti) + π5i(Playing games ti) + π6i(PI Mother ti) + π7i(PI Father ti) + π8i(Housewife ti) + π9i(Number of siblings ti) + eti

Level-2 Model

π0i = β00 + β01(Born in January i) + β02(Female i) + β03(Mean of Housewife i) + β04(Mean of number of siblings i) + β05(Mean of *juku* participation i) + β06(Mean of distance learning service i) + β07(Mean of television viewing i) + β08(Mean of playing games i) + β09(Mean of PI Mother i) + β010 (Mean of PI Father i) + β011(Parental education i) + r0i, π1i = β10, π2i = β20, π3i = β30, π4i = β40, π5i = β50, π6i = β60, π7i = β70, π8i = β80, π9i = β90

The level 2 equation predicts the intercept of level 1, π0i, to explain the variation between individuals, while the six PI indicators (from π2i to π7i) are the vectors of measures for the i-th individual at time t.

Results

Parenting practices: Shadow education participation

Table 3 shows the results of the HLM growth curve analyses that predict whether the child participates in *juku* lessons and takes distance learning service, respectively. As the time-varying dependent variable is binary, a logistic growth curve model was employed with each shadow-education variable. According to positive coefficients and significant levels of "Parental Education" predicting the intercept (the first grade-level) and "Time"-slope (yearly growth), children with highly educated parents are exposed to additional learning opportunities outside of school when they were first grade students (at the time of the seventh wave of the survey) and this trend persists over time. More concretely, when one of their parents is a college graduate, children would participate in *juku* lessons 1.336 times more than those whose parents were not college educated. If both parents are college graduates, the likelihood of participating in *juku* lessons at the seventh grade level is about 1.785 times (1.336 x 1.336) higher than that of children whose parents are not college educated. While the participation rate of *juku* attendance increases as years go by, children with highly educated parents are more likely to participate in *juku* lessons over time. This pattern, which is consistent with the hypothesis, holds for "distance learning service"; children with one or two college-educated parents take distance learning service and this is the case over time. One notable difference between the two sets of results is that while the number of siblings predicts whether children take *juku* lessons and distance learning service at the first grade level, it does not explain the growth curve of distance learning services. Since the tuition for *juku* is generally more expensive than that of distance learning services, a larger number of siblings might hinder their parents from paying for *juku* lessons.

Parenting practices: Time spent on television viewing/video gaming

Results shown in Table 4 are derived from HLM growth curve models predicting hours spent on non-school activities. That is, these results indicate factors associated with hours of television viewing and those of video gaming per week. Being consistent with the hypothesis, "Parental Education" negatively predicts the intercept and "Time"-slop; college educated parents organize/control their child's time outside of school, limiting their child's engagement in such activities.[9] Children with one or two college educated parents viewed less television (about 1.8 hours per week for one college- educated parent and 3.6 hours per week for both parents with college degrees), compared with those parents who had not completed higher education. "Parental education" is also negatively related to the growth of time spent on television/games, while the number of hours generally increased as children become older. Taken together with the results regarding the shadow

[9] It should be noted that some of the television contents might be educational.

education services, highly educated parents organize their children's time in ways that advantage their children's education: more educational opportunities outside of school and less television/games time.

Parenting practices: Parental involvement in home-learning

Table 5 reports results of HLM growth curve models that predict the degree of parental involvement in children's learning at home. "Parental Education" is negatively related to students' initial status (the intercept); however, it positively impacts its growth rate, suggesting partial support for the hypothesis. This means that parents without college education appear to demonstrate a higher degree of parental involvement, compared to college educated parents when children were in the 1st grade for both Mother PI and Father PI. However, the degree of PI by educated parents becomes higher than that of parents without college education when children reach fourth grade (Wave 10), while the means of each indicator decrease little by little, as the coefficient of "Time" is negative (this is observed by the means in Table 1, especially PI Mother).

Learning time

The results of the analyses regarding the six PI indicators essentially show that highly educated parents engage in their children's education outside of school during the early elementary school stages in Japanese society. Next, the study assesses whether these parenting practices that differ by parental education background are associated with between-individual differences and within-individual differences in learning time outside of school. In other words, the study attempts to reveal whether the six PI indicators could partly explain who studies longer and children' changes in learning time outside of school.

Before going into details of the analysis, Figure 1 was developed to illustrate differences in learning time between the three parent-education groups. At the first grade, the difference between the groups is not large, but the disparities in learning time between the groups widen as children progress through the education system, especially, at the fourth grade level. While "Parental Education" seemingly explains the difference in learning time, the results of the hybrid fixed effects model show that the six indicators of parental practices predict the intercept (between individual differences) and changes (within-individual differences) in learning time outside of school.

Table 6 provides empirical evidence of the effort-gap; participating in *juku* lessons, taking distance learning service, watching fewer hours of television (negative coefficient), video gaming for less hours (negative coefficient), and receiving a higher degree of mothers' and fathers' involvement in the child's learning at home are associated with both levels and changes in longer hours of learning time outside of school. In other words, the six PI indicators partly explain the disparities in learning time between children and the widening disparities in learning hours over time, while parental education is not a significant predictor of the outcome.

According to magnitudes of coefficients of the variables at both level 1 (within-individual level) and level 2 (between-individual level), *juku* participation is the most significant predictor for both between-individual and within-individual differences in learning time. As the learning time includes time spent on studying including time at *juku* institutions, the result is understandable and explains a substantial part of the disparities between children and the growing disparities in learning time outside of school even at the level of early elementary school years. Compared to *juku* participation, the other type of shadow education service, distance learning service, plays a much smaller role in shaping one's learning time in both aspects (between-individual and within-individual differences), according to a coefficient at each level.

As for the other four PI indicators, the time spent on television/games also relates to between-individual differences in learning time, but its magnitude is small, considering the maximum number of television viewing/video gaming is 42. Meanwhile, the mother's involvement in a child's learning at home seems to have substantial effects on the child's learning time, as the

variable ranges from 0 to 8. Even though the magnitude is about half of that of the mother's involvement, the father's parental involvement in home-learning is also associated with children's longer learning time. Turning attention to the results of these four PI indicators at level 1 (within-individual differences), changes in the PI indicators relate to changes in learning time, while time invariant unobserved heterogeneity is controlled for.

Discussion

In a society where between-school differences are small, parental advantages are mainly transmitted to their children outside of school; the disparities in learning opportunities and learning time outside of school could be sources of the achievement gap inside school, leading to an inequality in educational attainment. This study attempts to reveal relationships between parental practices that differ by parental social class and children' learning time outside of school during the early elementary school years by employing an HLM growth curve modeling and hybrid fixed effects method with the national longitudinal data. The results of the study essentially support the hypothesis except the between-individual differences in PI mother and PI father; highly educated parents engage in the parenting practices that could be seen as "concerted cultivation" (Lareau 2003, 2011) and "rigorous" parenting (Honda 2008) when the children are first graders and this trend persists over the four years. Specifically, the study extends the previous findings about elementary schoolchildren's shadow education participation in Japan (e.g., Honda 2008, Sugihara 2011); advantaged children use shadow education services even at the first grade level and this group of children's growth rate of participation is higher than that of those with less-educated parents over the years. Additionally, the study finds that highly educated parents engage in parenting practices that organize/monitor/supervise their child's time outside of school, and, again, this trend persists over the observed years. Then, the study reveals that these social-class related parenting practices are associated with the levels and changes of a child's learning time outside of school. This extends findings about the relationship between SES and sixth grade students' learning time (Kaneko 2004, Otawa 2008) and the argument by Uzuki (2004) and Koyama (2011) that mother's active approaches toward their children's education relate to fifth and sixth grade students' and second year junior high school students' learning time. The results of the study suggest that this effect began even before the higher grades at elementary school, revealing the beginning of the differentials in effort. This empirical evidence indicates when and how parental advantage is transmitted to their children outside of school in a society with a relatively equitable education system; the inequality in effort due to parents' education background already exists when children enter the compulsory education system, and the disparities in effort continue to grow over the four years.

Children with college-educated parents tend to have more learning opportunities (i.e., *juku* participation and taking long distance learning), to spend less time on non-schoolwork (i.e., television viewing and video gaming) under, presumably, parents' control, and to receive attention/intervention by parents (i.e., PI mother and PI father), and this trend persisted over the observed period. In the meantime, children with less-educated parents are more likely to receive less outside-of-school educational opportunities, to spend more time watching television and playing video-games, and to have less parental intervention with learning at home in the early years of compulsory education. Without understanding that these social class-parenting practices relate to children's learning time outside of school, how much effort a child exerts would be regarded as "entirely a matter of individual freewill (Kariya, 2013: 127), concealing SES-effects on educational trajectories.

The results of this study indicate how the achievement gap emerges and widens in a society with less between-school disparities. In fact, the magnitude of the inequality in effort is quite substantial, when comparing the number of hours that children study outside of school with that of the national school curriculum, which is controlled by the Ministry of Education, Culture, Sports, Science and

Technology (MEXT). For example, the mean number of hours that first graders study outside of school (Wave 7) is 5.046 per week, as Table 1 shows. That is 262.392 hours a year (5.046 x 52 weeks), based on the premise that the number of hours that children study does not greatly change during summer/winter vacation. Meanwhile, according to the national curriculum guidelines (Ministry of Education, Culture, Sports, Science and Technology), first grade students spend 289.5 course hours in the main subjects (i.e., national language, which is equivalent to language arts, or English, in U.S. and arithmetic) for one academic year (386 school hours x 0.75: 45 minutes per session). As schools open for only about 35 weeks per year, the number of hours should be compared with caution, but, from this rough calculation, we see that the number of hours that first grade students study outside of school is substantial. This is especially so when looking at the difference between children whose learning time outside of school is 1 SD above the mean (444.756 hours), and those whose number of hours spent on studying is 1 SD below the mean (80.028 hours); the disparities in learning time between them are 364.728 hours, which is more than the total number of school hours of the main subjects. When comparing the mean and 1 SD above the mean of learning time, it is still 182.364 hours, which is a substantial exposure to academics. This inequality in hours spent on studying outside of school grows over the years. When children reach the fourth grade level, their average learning time outside of school is 367.744 hours per year. The number of hours of instruction of the core subjects (i.e., national language, arithmetic, social studies and science) also increases to 420 hours (560 school-hours x 0.75: 45 minutes per lesson). Again, if comparing the students who spend 1 SD-above and 1 SD-below the mean hours outside of school, the difference between them is 458.952 hours (597.22-138.268), which are much longer than the hours spent in the four core-subject lessons in the school system that offers relatively equal learning opportunities. The difference between the mean and 1 SD above the mean for the year is 229.476 hours, which could be sufficient learning time to have an impact on fourth grade students' academic skills. The empirical results of this study suggest that the disparities in learning time between students who study longer and those who study less are partly derived from the different parenting practices/involvement that vary by parental education background. This inequality in effort based on social class parenting practices is likely to continue to grow, and is presumably one of the major sources of the achievement gap along socioeconomic lines.

Implications

For policy

This study reveals the disparities in effort partly due to social class differences in parenting practices at the early stages of education. Japanese compulsory education may still be highly regarded as offering relatively equal learning opportunities, especially when compared to other societies like the U.S. that has large disparities between schools. However, even when the centralized system (i.e., MEXT) equalizes learning opportunities for all children, advantaged parents attempt to further benefit their children through active parenting practices, and the inequality in effort grows over the first four years of compulsory education. This could lead to the argument that, since providing equal opportunities for all children is insufficient, more opportunities need to be given to disadvantaged children. In fact, among the six types of parenting practices, the magnitude of *juku* participation is the strongest with levels and changes in children's hours of studying outside of school, while the other PI indicators are also significantly associated with children's learning time. In addition, parental education significantly relates to levels and changes in child's *juku* participation. Taken together, providing supplemental free lessons for children who cannot afford to attend *juku* institutions may be an option to achieve equality in effort, which is one of the conditions that should be met to justify "meritocratic" selection. One example of this policy is explained by Ireson (Ireson 2004); the UK government invested in extracurricular lessons called "Study Support" to help disadvantaged students to improve their academic achievement. Another example is the

Supplemental Educational Services provided by the No Child Left Behind Act, although effects of service providers on outcomes vary (e.g., Heinrich and Nisar 2013).

One may think that policies promoting more parental involvement would narrow the effort gap, based on the findings of the study; specifically, it could be recommended that disadvantaged parents should actively monitor/supervise their child regarding television viewing/video gaming and engage in their child's learning at home more and more. However, it would be unrealistic to expect positive results that continue for years, since lower degrees of parental involvement in their children's education are likely due to fewer resources (e.g., network and money that would back up their continuous effort), as the literature in the two societies suggest (e.g., Chin and Phillips 2004, Bennett, Lutz and Jayaram 2012, Honda 2008, Lareau 2003, 2011).

For Research

The data of this study is limited since it does not include information regarding children's cognitive and non-cognitive skills. Additionally, although the study controls time invariant unobserved heterogeneity by employing the hybrid fixed effects model, there may be some unobserved time-varying factors that are associated with the six PI indicators and children's learning time. Further studies need to be carried out to assess the relationship between inequality in effort and the achievement gap, while including more aspects of parental involvement that are time-varying.

Conclusion

This study provides empirical evidence of when and how the disparities in effort emerge and widen by analyzing four waves of the Longitudinal Survey of Babies in the 21st Century. It is important to emphasize that these results are obtained from a country where there is less inequality between schools. Because of the relatively equal elementary education system, the belief in meritocracy could be taken as valid, while the current study shows that social class is related to parenting practices, which, in turn, influences elementary-school-aged children's learning time outside of school. Advantaged children who have more learning opportunities, spend less time television viewing and video gaming and receive more parental intervention would probably build on these learning experiences that accumulate over the years outside of elementary schools, likely leading to the next cycle of engagement in outside-school-learning activities, as they would be accustomed to studying after school by spending a substantial amount of time studying. Meanwhile, disadvantaged children who have fewer learning opportunities, spend a substantial amount of time watching television and video gaming at home and receive less interventions by their parents, spend less time studying outside of school. The achievement gap may not be realized by parents and students until the first regular exam administrated during the first semester of junior high school, but these disparities in learning experiences (including participating in additional instructional lessons and exerting substantial effort in self-studying) outside of school exist from the first grade and this inequality continues to grow over the years, which is likely to be the source of the gaps in academic ability and efforts that subsequently influence children's educational and occupational trajectories.

Table 1. Descriptive statistics of variables (N=34907)

Variables		Mean	SD	Minimum	Maximum
Learning hours per week	Mean	6.032	3.138	0	35
	Wave 7	5.046	3.507	0	35
	Wave 8	6.008	3.792	0	35
	Wave 9	6.213	3.865	0	35
	Wave 10	7.072	4.413	0	35
Juku participation	Mean	0.164	0.310	0	1
	Wave 7	0.108	0.310	0	1
	Wave 8	0.131	0.338	0	1
	Wave 9	0.188	0.391	0	1
	Wave 10	0.247	0.431	0	1
Distance learning service	Mean	0.195	0.306	0	1
	Wave 7	0.123	0.328	0	1
	Wave 8	0.211	0.408	0	1
	Wave 9	0.246	0.431	0	1
	Wave 10	0.242	0.428	0	1
Hours of television viewing per week	Mean	13.810	6.189	0	42
	Wave 7	12.697	6.708	0	42
	Wave 8	13.464	6.934	0	42
	Wave 9	14.190	7.241	0	42
	Wave 10	14.868	7.308	0	42
Hours of video gaming per week	Mean	4.984	4.130	0	42
	Wave 7	4.109	4.492	0	42
	Wave 8	4.745	4.718	0	42
	Wave 9	5.543	4.995	0	42
	Wave 10	5.555	5.131	0	42
Parental involvement (PI) Mother	Mean	5.778	1.511	0	8
	Wave 7	6.058	1.732	0	8
	Wave 8	5.900	1.744	0	8
	Wave 9	5.770	1.812	0	8
	Wave 10	5.396	1.884	0	8
PI Father	Mean	2.482	1.735	0	8
	Wave 7	2.450	2.017	0	8
	Wave 8	2.565	2.021	0	8
	Wave 9	2.514	1.998	0	8
	Wave 10	2.432	1.980	0	8
Housewife (reference = all others)	Mean	0.329	0.397	0	1
	Wave 7	0.380	0.486	0	1
	Wave 8	0.340	0.473	0	1
	Wave 9	0.310	0.464	0	1
	Wave 10	0.300	0.456	0	1
Number of siblings	Mean	1.260	0.750	0	8
	Wave 7	1.230	0.746	0	7
	Wave 8	1.260	0.751	0	7
	Wave 9	1.270	0.756	0	7
	Wave 10	1.270	0.761	0	8
Born in January		0.497	0.500	0	1
Female		0.481	0.500	0	1

Parental Education	0.545	0.700	0	2

N is the number of cases included in the all analyses.

Table 2. (N=34907)

	Intercept/VC	Level1/VC	ICC (%)
Juku participation	2.88	n/a	46.70%
Distance learning	2.03	n/a	38.19%
Television viewing	32.38	17.98	64.29%
Video gaming	13.55	10.29	56.84%
PI Mother	1.79	1.49	54.62%
PI Father	2.49	1.54	61.79%
Learning hours	6.99	8.72	44.50%

VC=Variance Component, ICC=Intraclass correlation

Table 3. Predicting the purchase of shadow education services (N=34907)

	Juku Participation				*Distance Learning Service*			
	Coefficient		Std. Error	Odds Ratio	Coefficient		Std. Error	Odds Ratio
Fixed Effect								
Between Individual Level								
Intercept	-3.258	***	0.034	0.038	-2.404	***	0.027	0.090
Born in Jan	0.189	***	0.028	1.208	-0.068	**	0.023	0.934
Female	-0.052	†	0.028	0.949	0.125	***	0.023	1.133
House Wife	0.035		0.036	1.035	0.389	***	0.029	1.475
N of Siblings	-0.300	***	0.020	0.741	-0.382	***	0.016	0.683
Parental Education	0.289	***	0.030	1.336	0.440	***	0.022	1.553
Within-Individual Level								
Time	0.532	***	0.011	1.702	0.276	***	0.009	1.317
Parental Education	0.053	***	0.011	1.055	0.028	**	0.009	1.028
House Wife	-0.030		0.029	0.970	-0.010		0.027	0.990
N of Siblings	-0.166	*	0.066	0.847	0.043		0.058	1.044
Random Effect	Standard Deviation		Variance Component		Standard Deviation		Variance Component	
Intercept	2.066		4.268		1.370		1.877	
Time	0.166		0.028		0.058		0.003	

† p < .10, * p < .05, ** p < .01, *** p < .001.

Table 4. Predicting time spent on television/games (N=34907)

	Hours of television viewing			*Hours of video gaming*		
	Coefficient		Std. Error	Coefficient		Std. Error
Fixed Effect						
Between Individual Level						
Intercept	13.426	***	0.063	5.397	***	0.043
Born in Jan	0.539	***	0.064	1.103	***	0.040
Female	0.050		0.064	-2.493	***	0.040
House Wife	-0.389	***	0.082	-0.167	***	0.051
N of Siblings	0.120	**	0.043	0.012		0.028
Parental Education	-1.813	***	0.048	-0.950	***	0.030
Within-Individual Level						
Time	0.834	***	0.016	0.561	***	0.012
Parental Education	-0.142	***	0.016	-0.060	***	0.012
House Wife	-0.002		0.046	-0.040		0.035
N of Siblings	0.044		0.102	0.238	**	0.078
Random Effect	Standard Deviation		Variance Component	Standard Deviation		Variance Component
Intercept	5.469	***	29.905	3.298	***	10.874
Time	1.080	***	1.167	0.880	***	0.775
Level-1	3.886	n/a	15.102	2.924	n/a	8.551

† p < .10, * p < .05, ** p < .01, *** p < .001.

Table 5. Predicting the degree of parental involvement (N=34907)

	Mother PI			*Father PI*		
	Coefficient		Std. Error	Coefficient		Std. Error
Fixed Effect						
Between Individual Level						
Intercept	6.233	***	0.016	2.615	***	0.019
Born in Jan	0.023		0.016	0.176	***	0.018
Female	-0.294	***	0.016	-0.280	***	0.018
House Wife	0.488	***	0.020	-0.251	***	0.023
N of Siblings	-0.249	***	0.011	-0.102	***	0.012
Parental Education	-0.041	**	0.013	-0.106	***	0.015
Within-Individual Level						
Time	-0.221	***	0.005	-0.045	***	0.005
Parental Education	0.021	***	0.005	0.050	***	0.005
House Wife	0.097	***	0.013	-0.096	***	0.014
N of Siblings	0.014		0.028	-0.018		0.030
Random Effect	Standard Deviation		Variance Component	Standard Deviation		Variance Component
Intercept	1.335	***	1.783	1.654	***	2.735
Time	0.355	***	0.126	0.335	***	0.112
Level-1	1.098	n/a	1.205	1.164	n/a	1.354

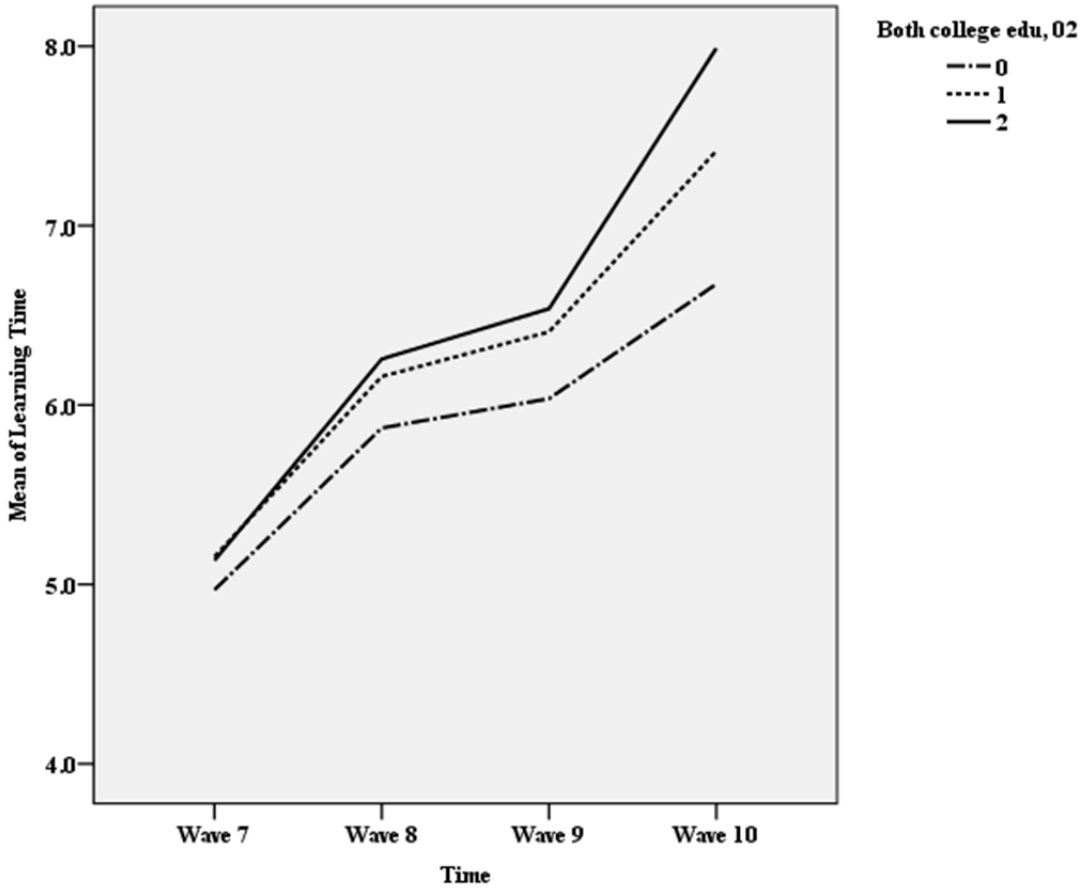
† p < .10, * p < .05, ** p < .01, *** p < .001.

Table 6. Predicting learning time (N=34907)

Learning Hours			
	Coefficient		Std. Error
Fixed Effect			
Between Individual Level			
Intercept	4.791	***	0.030
Born in Jan	0.171	***	0.030
Female	0.658	***	0.031
House Wife (M)	0.408	***	0.039
N of Siblings (M)	-0.176	***	0.020
Juku Participation (M)	3.259	***	0.059
Distance Learning (M)	0.654	***	0.050
Television Viewing (M)	-0.009	**	0.003
Video Gaming (M)	-0.026	***	0.004
PI Mother (M)	0.451	***	0.010
PI Father (M)	0.211	***	0.009
Parental Education (M)	0.015		0.022
Within-Individual Level (N=122064)			
Time	0.580	***	0.009
Juku Participation	1.941	***	0.051
Distance Learning	0.137	***	0.032
Television Viewing	-0.007	**	0.002
Video Gaming	-0.018	***	0.003
PI Mother	0.143	***	0.008
PI Father	0.105	***	0.009
House Wife	-0.010		0.033
N of Siblings	-0.008		0.068
Random Effect	Standard Deviation		Variance Component
Intercept	2.248	***	5.053
Level-1	2.790	n/a	7.786

† p < .10, * p < .05, ** p < .01, *** p < .001., M = mean

Figure 1. Learning time



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