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Emerging inequality in effort: A longitudinal investigation of parental involvement and early elementary school-aged children's learning time in Japan

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ABSTRACT

While studies on effort (e.g., Carbonaro, 2005; Kariya, 2000, 2013) have revealed relationships among students' effort (e.g., self-reported learning time), socioeconomic status, and school-related factors (e.g., tracking) through secondary education data, whether and how the effort gap emerges and widens in the early years of compulsory education have not been researched. This study investigates the beginning of inequality in effort by using four waves (from first- to fourth-grade students) of the Longitudinal Survey of Babies in the 21st Century, collected in Japan. The results indicate that college-educated parents tend to employ parenting practices that directly and indirectly shape children's learning time; inequality in effort exists, and it becomes exacerbated partly because of parenting differences in a society with a relatively equal elementary education system.

1. Introduction

In a meritocratic society, individuals' merit is regarded as a combination of their ability and effort (Young, 1958). According to studies on effort (e.g., Carbonaro, 2005; Kariya, 2000, 2013), while a meritocracy presumes that particular conditions such as parents' social class do not affect "merit" (i.e., ability and effort), how much effort one applies is, in fact, influenced by individual and school-related factors such as family socioeconomic status (SES) and ability grouping or tracking. It is critically important to investigate the differences in effort especially in a society such as Japan where, as Kariya (2000, 2013) notes, hard work is emphasized and embraced more than ability as a determinant of educational attainment. More specifically, the Japanese-style meritocracy is based on "the premise that ability is distributed equally among classes and effort (is) entirely a matter of individual freewill" (Kariya, 2013, p. 127). Kariya (2000, 2013) seeks to demonstrate that this belief is a mere ideological construct by empirically showing social-class differentials in effort among high school students; he contends that the disparity in educational attainment is not solely a consequence of differences in ability, but of hidden influences of social class through disparity in effort. Therefore, failing to consider the influence of social class on disparity in effort obscures the relationship between social class and educational attainment (Kariya, 2000, 2013).[1]

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[1] A relationship between individuals' social background and their educational attainment in Japanese society has been repeatedly documented (e.g., LeTendre, 1996).

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Given that the inequality in effort conceals that of educational attainment (Kariya, 2000, 2013), previous studies in Japan have attempted to disentangle relationships between students' SES, students' effort, and school-related factors by using lower and upper secondary education data. However, whether and how the effort gap emerges in the early years of compulsory education have not been researched. Therefore, this study attempts to deepen our understanding of social class inequality in effort by shedding light on the beginning stage of compulsory education, using four waves (from first- to fourth-grade students) of the Longitudinal Survey of Babies in the 21st Century, which was conducted by the Japanese Ministry of Health, Labour and Welfare between 2001 and 2011. This study first identifies whether parents' level of education relates to their parenting practices that directly and indirectly shape children's learning time outside school. Second, it investigates whether parenting practices influence children's learning time, so as to discover whether and how the inequality in effort emerges and increases in the early years of compulsory education.

The Japanese context is distinctive in that it helps add new insight to processes of social reproduction because social-class differences in parenting practices are considered a source of inequality in educational attainment (e.g., Honda, 2008). Unlike the US, Japanese compulsory education is progressively funded across 47 prefectures; economically backward prefectures spend more per student based on financial support from the central government (Kariya, 2009). Presumably because of this progressive investment in public education, between-school differences are small in elementary education in terms of financing level and teacher qualification (e.g., Cummings, 1980); this means that students who attend public schools (about 99% of the student population) receive relatively similar learning experiences within the formal education system.[2] Thus, the achievement gap along socioeconomic lines likely emerges outside the formal school system, rather than inside classrooms, and is based on differences in parenting practices including whether to use outside-school educational services. This examination with Japanese data is intended to be a rigorous test case to reveal how parental advantages are transmitted to their children through outside-school education in a seemingly egalitarian education system.

2. 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 investigated the association between students' family backgrounds and their levels of effort in learning. Kariya's study on high school students' learning hours outside formal schooling indicates considerable differences in the length of self-study hours, depending on students' SES and high school ranking (tracking position). Additionally, students' SES came to play a greater role in shaping their learning hours outside school between 1979 and 1997 (Kariya, 2000, 2013; Kariya and Rosenbaum, 2003). Apart from Kariya's research, a few empirical studies on students' effort and study habits have been conducted 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, 2013), and high school seniors (Aramaki, 2002).

Importantly, the relationship between children's learning time and their academic performance has also been assessed. A recent study by Shinogaya and Akabayashi (2012) using structural equation modeling indicates that children's family SES and educational investment in activities outside school, including shadow education services, are associated with differences in learning time, which then shape their academic performance. In other words, children's learning time mediates a relationship between SES and academic performance in elementary education (fourth to sixth grade). The association between learning time and achievement in sixth grade (the final grade in elementary education) has also been repeatedly documented by annual nationwide surveys conducted by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) on academic ability from 2007 to 2014.[3] This tendency—namely, that the longer sixth graders apply effort (i.e., studying longer outside schools), the better they perform academically—remains valid when other factors including family SES and parental educational expectations for their children are controlled, according to a research report by Ochanomizu University (2014),[4] which combined data from the nationwide survey for the academic year 2013 with an additional survey of children's guardians, it was noted that sixth graders' learning time independently influences their academic performance.

In addition to these studies using domestic data, the association between learning time and achievement in Japan has been consistently demonstrated on large-scale international surveys, specifically Trends in International Mathematics and Science Study (TIMSS) and Programme for International Student Assessment (PISA). In fact, in Japan, students who reportedly spent the longest time studying mathematics or worked on math homework outside school have the highest mean achievement scores in fourth grade (Mullis et al., 1997) and eighth grade (Beaton et al., 1996), as assessed by TIMSS, and in tenth grade, as determined by PISA (OECD, 2011). This pattern holds even when controlling for other individual and school characteristics such as students' SES and school factors, according to studies (OECD, 2011; Matsuoka, 2013) using PISA 2006. Crucially, this consistent pattern across the grades appears to be specific to Japan and not applicable to most countries such

[2] To verify this point, intraclass correlation (ICC) was estimated using the fourth-grade dataset of Trends in International Mathematics and Science Study (TIMSS) administered in 2011. The results showed that approximately only 5% variation in math achievement exists between elementary schools in Japan, while it is about 30% in the US, implying greater gaps among US schools.

[3] Through correlation analyses and comparison of means (crosstabs), reports by the National Institute for Educational Policy Research (NIER) indicate a consistent correlation between children's learning time outside school and their academic performance in the national language and arithmetic tests.

[4] In this report, the SES variable, used in regression analyses, was created based on parents' education and household income from the survey of guardians.

as the United States where the students who do the most studying outside school obtain moderate (not the highest) mean achievement scores.[5]

3. Social class and parental involvement

To understand which students spend more time studying in the early years of elementary education, parenting practices must be considered because parents are likely to play a greater role in directly and indirectly influencing young children's time outside school. In the prominent study of social-class disparities in parenting, Lareau (2003, 2011) coined the term "concerted cultivation," i.e., a cultural logic of parenting practices that middle-class parents follow: these parents structure their children's daily lives. More specifically, they tend to schedule children's time outside school with extracurricular activities, emphasize the importance of language by reasoning with their children, and engage in active interactions with social institutions, such as schools, to develop their children's cognitive and social capabilities. In the meantime, working-class parents follow the "accomplishment of natural growth," i.e., a logic that stresses children's development with less rigorous guidance; these parents are less likely to structure children's time, use directive language with their children, and tend to have fewer interactions with social institutions. These differences in parenting practices contribute to children's different levels of engagement in structured activities and result in 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; Bodovski and Farkas, 2008; Cheadle and Amato, 2011).

Building on Lareau's study, by interviewing parents at two urban middle schools, Bennett et al. (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 to develop their talents and interests, whereas 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; in other words, disadvantaged parents have less access to institutions besides school and church (Bennett et al., 2012). This line of argument parallels the ethnographic study by Chin and Phillips (2004) that reported social-class differences in the quality and quantity of fourth-grade children's participation in activities during summer. The study then argues that these disparities stem from parents' different levels of access to various resources (e.g., networks and money).

As for studies carried out in the Japanese society investigated by this study, relationships between SES and parental involvement(PI)/strategies (e.g., Kataoka, 2001) and between SES 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 vary depending on SES), 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 nationwide survey data of youth (aged from 15 to 29) and their mothers (1890 pairs) were analyzed. Findings 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), whereas 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 parents and "accomplishment of natural growth" followed by

[5] Although recent waves of TIMSS (e.g., TIMSS 2011) have only asked students how many minutes they spend on homework, TIMSS 1995 included a question for fourth-grade students regarding how much time they spent studying mathematics or doing mathematics homework before or after school on a normal school day. This wording would have included the time spent not only on assigned homework but also other time spent on the subject such as self-study time and lesson hours in shadow education. In Japan, the mean math achievement score of fourth-grade students (10% of the sampled students) responding "no time" was 558, that of those spending "less than one hour" (60%) was 598, and that of those studying "one hour or more" (31%) was 610. In contrast, the mean scores of their counterparts in the United States were 516 (8% of the U.S. sample), 561 (60%), and 528 (32%) for each category of learning time, respectively (Table 4.9; Mullis et al., 1997: 127). In other words, the mean score of those studying the longest outside school hours was the highest in Japan, but this trend was not applicable to U.S. students. Among the 25 education systems presented in the table, only Korea, another East Asian country, and Iran shared this pattern with Japan, whereas 19 systems were similar to the U.S. (i.e., with the group reporting "less than one hour" achieving the highest in each system). These patterns can also be observed with regard to the association between students' time studying or doing homework in all subjects and math achievement scores in eighth grade (Beaton et al., 1996); the group of students spending the longest time studying had the highest mean math achievement score in only seven countries (including Japan and Korea) among 39 education systems, whereas a group of students who spent less time studying had the highest scores in the other countries, including the U.S. Likewise, PISA 2006 included a question regarding how much time target students (15-year-olds) spent studying or working on math homework per week (OECD, 2011). In Japan, the mean math achievement scores ranged from 486 (no time) to 573 (six hours or more) among five groups divided by self-study time (or time spent in "individual study," to use OECD's term), including homework time, but excluding additional lesson hours outside of regular lessons (e.g., lessons in shadow education in Japanese context); the mean score increased steadily with longer hours of self-study time. Only four of 30 OECD countries shared this trend. The others showed inconsistent relationships between learning time and achievement: e.g., among U.S. students, mean scores for three of the groups were 458 (no time, the lowest group in terms of achievement), 494 (more than two hours but less than four hours, the highest group), and 472 (six or more hours) (Table 4.8b; OECD, 2011: 265). Importantly, the pattern remains the same for Japan (and Korea) even when students' and schools' SES and students' math learning time in regular school and out-of-school lessons are accounted for (OECD, 2011: 266). Using Japanese data from PISA 2006, Matsuoka (2013) also demonstrated that achievement is associated with self-study time even when student and school characteristics (e.g., SES and school tracking factors) are controlled. All these international comparisons suggest that Japan is distinctive in terms of the positive association between students' amount of learning time outside school and their achievement.

working-class and poor parents (Honda, 2008). In addition, according to the study's quantitative analyses of mothers' retrospective responses of their elementary school child-rearing practices, higher SES mothers are more likely to demonstrate certain parenting practices. More concretely, higher SES mothers 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, and letting their children play outside so that various sorts of experiences are obtained). These advantaged mothers engage in the former style more than their lower SES counterparts.[6] Another recently conducted study by Sugihara (2011), using data from four cities, also reported differences in mothers' parenting practices (e.g., giving a number of picture books to their children) contingent on the mothers' educational background. More concretely, Sugihara found differences in the use of shadow education enrichment-lessons, the length of learning minutes, and education expense, depending on both parents' educational qualifications when the children were at the fifth-grade level in Tokyo. Moreover, Yamamoto (2015) assessed differences in parenting beliefs and practices between middle-class and working-class mothers[7] when their children were in preschool through second grade. Yamamoto conducted in-depth interviews with 16 mothers over these years, and found out that middle-class mothers believed in their ability to help their children and also attempted to cultivate their children's interest in learning and developing learning habits (e.g., by sending their children to participate in extracurricular activities and monitoring their children's academic progress). Furthermore, they also monitor instructions at school rather than simply relying on schoolteachers to manage their children's academic progress; since they believe that they have little control over what happens in school, they supplement their children's education at home or by using shadow education services (e.g., *juku*) (Yamamoto, 2015). In contrast, working-class mothers who were part of Yamamoto's study believe that children's interests develop naturally; these mothers had greater difficulty in educating themselves and exhibited less confidence in their ability to teach their children. They rarely established routines for their children (e.g., setting times for completing homework) and relied on schoolteachers; further, they rarely sought educational advice from schoolteachers and other professionals or utilized shadow education services or extracurricular activities (Yamamoto, 2015).

Considering the context of Japanese education, it is critical that Honda (2008) considers the use of shadow education as part 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, 2015; Yamamoto and Brinton, 2010) show that a family's SES influences children's shadow education participation (e.g., *yobiko* and *juku*) in Japan.

4. Effects of parental involvement

Lareau (2003, 2011) argues that the differences in parenting between middle-class and working-class parents contribute to different levels of children's engagement in structured activities. Along with parent–child interactions (e.g., a dialog regarding life decisions), these disparities could 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). Studies using large-scale longitudinal data support the relationship between Lareau's "concerted cultivation" and achievement (Bodovski and Farkas, 2008; Cheadle, 2009). Other studies also indicate that PI relates to a wide range of educational outcomes: academic performance (e.g., Hill and Tyson, 2009; Bodovski and Farkas, 2008), problem behaviors (e.g., Domina, 2005; El Nokali et al., 2010), junior-high school students' placement in ability groups (Useem, 1992), intrinsic motivation and self-efficacy in English and math (Fan and Williams, 2010), school persistence of upper secondary education students (e.g., McNeal, 1999), and major choices in college (Ma, 2009), even though definitions and measurements of outcomes differ in each 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 use 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 et al., 2011).

Studies conducted in Japanese society also indicate PI effects on some aspects of educational outcomes. More specifically, Uzuki (2004) shows that mothers' approach to education affect fifth and sixth graders' learning hours for both weekdays and holidays, and mothers' expectations for educational accomplishment influence 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 outcomes by analyzing mother–child pair data. The results of multiple regression analyses show that "rigorous" parenting, which parallels "concerted cultivation,"

[6] According to Honda (2008), advantaged mothers engage in both "rigorous" and "natural" parenting styles. This may be confusing, because, as Honda (2008) claims, these parenting styles appear parallel to Lareau's "concerted cultivation" and "accomplishment of natural growth," respectively. However, considering the wording of the variables representing each style in Honda's (2008) study, it is possible that higher-SES mothers include some "natural" parenting styles while employing "rigorous" childrearing styles.

[7] Eight middle-class mothers had college education (including attendance at a two-year institution); the other eight mothers, classified as working-class mothers, were high school graduates, except for one mother who had not finished high school.

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

5. Rationale for this study

As a whole, the literature indicates a relationship between social class and parenting styles (e.g., Lareau, 2003, 2011), and in the US, some parenting practices appear to have positive impacts on educational outcomes. The same argument could be made for Japan, but methodological issues of the literature, more specifically data limitations, should be addressed. The studies conducted in Japan that assess associations between SES, parenting styles, and some aspects of educational outcomes use regional and retrospective cross-sectional data that do not capture changes in PI and outcomes. This makes it especially difficult to assess effects of PI, whereas the findings in the literature seem plausible because they are mostly consistent with US-based research. In addition to the methodological aspect, it is crucial to investigate the inequality in effort in the early years of elementary education. Since study habits are likely to be internalized during the early years of education through family socialization, the SES effect on students' learning time might occur before they enter secondary school.[8] The statistical association between SES and learning time may imply that the internalized values/habits derived from childhood experiences influence their learning time during secondary education. Moreover, no connection between actual parenting practices and students' learning time at the early stages of elementary education has been addressed. Since Uzuki (2004) shows the relationship between mothers' educational attitudes and fifth and sixth graders' learning time, other aspects of PI possibly influence early elementary-aged children to study outside school as well. Additionally, the previous studies regarding learning time reveal the relationship between SES and effort at various stages of education. However, this field is clearly lacking in research because all studies use cross-sectional data, and no study has ever been conducted on early elementary school-aged children.

The current study overcomes the methodical weakness of the previous studies by using unique longitudinal data and attempts to fill the void in the literature on inequality in effort. Specifically, this study investigates whether (1) parenting practices differ by their education background (as the major aspect of SES) over time, (2) parenting practices relate to early elementary school-aged children's learning, and (3) effects of parenting practices vary by parental education. These empirical investigations help us understand whether and how SES-inequality in effort emerges and becomes exacerbated at early stages of compulsory education in a society where the intergenerational transmission of advantage occurs mainly through PI in children's education and educational activities outside school. This Japanese context provides a unique case in social reproduction research; it will reveal the advantaged parents' strategies as well as consequences of the disparities in parenting practices in a society with a centralized, relatively equal compulsory education system.

In addition, it is extremely important to investigate whether parenting practices that vary depending on parental education level relate to the amount of effort that early elementary school-aged children exert in our time, since neoliberal policies are presently becoming prevalent in a number of societies including Japan (e.g., school vouchers are proposed at municipal levels). These policies presume that individuals make choices freely and should be responsible for their consequences, despite SES-inequality in parenting practices and effort.

6. Research questions and hypotheses

The primary purpose of this study is to reveal the inequality in effort at the early stages of compulsory education. For this aim, the study first assesses disparities in parenting practices, as these are likely to shape children's learning time outside school. Thus, the first research question is as follows: *Do parenting practices differ by parents' educational background?*

This study hypothesizes, as the literature indicates, that parents engage differently in their child's education outside school; advantaged parents tend to organize and manage their child's time, including extracurricular activities. In other words, highly educated parents tend to demonstrate an overall parenting style consistent with Lareau's "concerted cultivation" (2003, 2011) and "rigorous" parenting (Honda, 2008). More specifically, parental education is hypothesized to relate positively to whether children take shadow education (*juku*) lesson and long-distance learning service over the years because the literature with cross-sectional data (Honda, 2008; Sugihara, 2011) shows that highly educated parents tend to use shadow education services. We expect to observe the same tendency with regard to whether children participate in extracurricular activities that are not directly intended to enhance or remedy their school performance but, rather, to help them develop certain skills and attitudes aligned with formal education. In addition, parents with college education are presumed to monitor/supervise their children's hours spent on television and games; parental education would be negatively

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

associated with hours of television viewing and video gaming per week. Finally, since Honda (2008) found that highly educated parents enforce discipline at home, parental education is assumed to relate positively to 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 a child's learning time?* "Levels" here mean between-individual differences, and "changes" refers to within-individual differences in a child's learning time. This study hypothesizes that parenting practices relate to levels and changes in the learning time because parents directly and indirectly influence how early elementary school-aged children spend their time outside 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 in fifth and sixth grades (Uzuki, 2004) and in the second year of junior high school (Koyama, 2011). In addition, because US literature (e.g., Dumais et al., 2012) suggests that the same PIs do not lead to identical educational outcomes because of differing family backgrounds, this study will test whether effects of parenting practices on a child's learning time vary by parental SES.

7. Data

To answer the research questions, this study utilized the Longitudinal Survey of Babies in the 21st Century, which included 10 waves of national data collected by the Japanese Ministry of Health, Labour and Welfare between 2001 and 2011. This longitudinal survey targeted 53,575 Japanese babies born between January 10–17 and July 10–17, 2001. As there were no seasonal and systematic patterns indicated in the birth population in the monthly vital statistics collected by the Ministry of Health, Labour and Welfare, the data was considered representative. The survey respondents 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. A year and a half after Wave 6, subsequent waves (Waves 7–10) were administered on January 18 and July 18, meaning that the subjects in these waves had reached the same school age (from first to fourth grade) at the time of the survey. On average, the response rate of each wave was about 90% (Ministry of Health Labour and Welfare). Since about 73% of the initial sample completed and returned the questionnaire, the response rates are relatively high and the level of data attrition relatively low. Kitamura (2013) points out that attrition bias is not a serious issue of the survey. The reason some respondents stop returning the survey is likely unrelated to their child's development. This study used the data of four consecutive waves (Wave 7–Wave 10) that included responses to a detailed series of questions on parenting practices and children's learning time outside school.

7.1. Dependent variable

The learning time outside school, which is often used as a proxy of effort in the literature (e.g., Kariya, 2000, 2013), is the main repeatedly measured dependent variable reported by the respondents at four points of time (Wave 7–10). The respondents were asked, "How much time does the child normally spend studying outside of school per day?" Respondents selected one of the following options: "None," "Less than 30 min," "30–60 min," "1–2 h," "2–3 h," "3–4 h," "4–5 h," and "More than 5 h." The responses were re-coded into the median (e.g., 1–2 h as 1.5)[9]: 0, 0.25, 0.75, 1.5, 2.5, 3.5, 4.5, and 5. This was multiplied by seven days; the variable represents how many hours the child studies per week outside school.[10]

7.2. Key independent variables

The key independent variables are nine types of PI indicating whether parents demonstrate an overall parenting style of "concerted cultivation" (Lareau, 2003, 2011) and of "rigorous" parenting (Honda, 2008). More specifically, these indicators are included in the study as parental practices that directly and indirectly shape children's learning behaviors. The following indicators are time varying for the four waves and show the degree of PI in organizing children's time and activities outside school: two types of shadow education participation, three types of extracurricular activity participation, hours of television viewing/video gaming, and degrees of each parent's involvement in the child's learning. These indicators are first used to create a crosstab to clarify relationships between parents' educational background (as a proxy for SES) and their degree of involvement. The indicators are then included in the final model to investigate whether the nine types of parenting practices relate to levels and changes in children's learning time outside school.

7.2.1. Shadow education

Variables were created to show two types of shadow education participation directly related to academics: *juku* (cram school) and distance learning services. These are meant to improve (through either enrichment or remedial assistance) children's academic performance as evaluated within formal schooling. In general, the tuition for *juku* is more expensive than

[9] Results of the analyses do not substantially change even when the dependent variable is used with the original coding that ranges from 0 to 7.

[10] The question regarding learning (*benkyo*) time contains a note stating that the respondent should "include time spent on homework assignments and time of *juku* lesson and so forth."

that for distance learning. Also, since attending *juku* institutions requires physical presence, the time of children who attend lessons is much more structured than that of those taking distance learning, which takes place at home. Those who participate in each shadow education service were coded as 1, and the others not using paid education service were coded as 0.

7.2.2. Extracurricular activity participation

Three binary variables were created to indicate whether children participate in three types of extracurricular activities that indirectly shape their learning time: English conversation,[11] abacus, and calligraphy. These extracurricular cultural activities are meant not to directly improve children's school performance but to equip them with certain academic skills. As these activities are adult-led structured learning opportunities, taking these cultural lessons, which are only indirectly related to academics, likely shapes children's dispositions in ways that are aligned with values that are regarded favorably by schoolteachers. Children who participated in an extracurricular activity were coded as 1 for that activity, whereas 0 indicates no participation.[12]

7.2.3. 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 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 devices)?" The respondents reported 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 schooldays and holidays were multiplied by five school days and by two holidays, and then combined 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 school, specifically, on non-schoolwork.

7.2.4. 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. 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 let the child decide when to study and ensure that the child adheres 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.[13]

7.3. SES variables

The following variables were created to represent parents' SES.

7.3.1. Parents' education

This variable indicates the parents' education level. When both parents are college graduates (including two-year college, four-year college, and graduate school), the student is coded as 2 (N = 8675, 27.1%). If only one of the parents has an associate degree or higher, the code granted for this variable is 1 (N = 9443, 29.5%). A code of 0 means that neither parent is college-educated (N = 13,876, 43.4%). Earning a degree from a two-year college is included in the definition of a college education, based on Kikkawa (2009), who made the same categorization when contending that Japanese society is mainly divided into two groups according to whether one is college-educated. This variable functions as a proxy for SES or social class because parental education has the strongest relationship with social-class related practices considered to be concerted cultivation, while other aspects of social class (e.g., income) have weaker ties to them (e.g., Cheadle and Amato, 2011). In addition, in Japanese society, individuals' final educational attainment is the strongest predictor of their attitudes and opinions toward education and other social issues (Kikkawa, 2009).

7.3.2. Annual household income

This log-transformed variable was created from Wave 7 to indicate respondents' annual household incomes.

[11] A choice in the questionnaire is written as "English conversation lessons (or other foreign languages)." As the wording identifies English as the principal language and most of the children studying foreign languages can be assumed to be studying English, this variable is shown as "English conversation lesson" in this article. Given the time of the survey (from 2007 to 2010) and children's ages (seven to ten), English conversation lessons are likely to be given face to face, in contrast with the online lessons that have become increasingly popular in recent years.

[12] When the three types of extracurricular activity participation (i.e., English conversation, abacus, and calligraphy) are combined (to create a summed number of types of EAs in which each child participates) and the analysis is repeated, the results are essentially unchanged. Moreover, the results hold even when the number of other types of extracurricular activities (e.g., sports and music) is included in this variable.

[13] Cronbach's Alpha for PI Father is 0.80 (the average for each wave), and it is around 0.67 for PI Mother. As PI Mother's Cronbach's Alpha would not improve with a deletion of any question, responses to the four questions are used to construct PI Mother.

7.4. Control variables

The children's demographic information is included in all models as control variables.

Gender: Female is coded as 1 and male as 0. As the nine types of PI likely change according to the child's gender, this information is obtained from Wave 1 and are included in the analyses.

Number of siblings: This is time varying and obtained from Waves 7 to 10. As structural theories (for example, Gecas, 1979) indicate, the number of siblings must be considered because it could influence PI.

Mother's employment status: Housewife or not looking for a job is coded as 1 and other options (e.g., part-time, self-employed, full-time) are indicated as 0. Mothers' employment status is included because mothers' physical presence at home as housewives is likely to increase the level of monitoring/supervising how their children spend time outside school.[14] 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 variables should be included in the analyses because PI and children's learning time presumably change as the children mature.

8. Method

The study first investigates whether highly educated parents tend to demonstrate "concerted cultivation" in the form of nine specific types of parenting practices by assessing relationships between the use of each practice and parental level of education. Then, by using a hybrid fixed effects model (Allison, 2009), the study tests whether the different parenting practices relate to between-individual differences and within-individual differences in learning time outside school. Since results of the hybrid fixed effects model for within-individual differences are identical to those of the fixed effects model (Allison, 2009; Miwa and Yamamoto, 2012; Nakazawa, 2012), this model helps in testing whether changes in parenting practices are associated with changes in learning time while the effects of the parenting practices on learning time between individuals (in this case, children) 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) 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 estimation of the time-varying dependent variable's changes over time.

Two hybrid fixed effects models were constructed and run. Model 1 includes only demographic information at both levels 1 and 2, whereas the nine variables regarding parenting practices were added into levels 1 and 2 for model 2. This enables us to observe whether an estimate for parental education becomes weaker from model 1 to model 2. If so, that would mean that the parenting practice variables mediate the relationship between parental education (as a proxy for SES or social class) and children's learning time. In other words, it would show that parental education influences children's learning time through parenting practices that differ according to the parents' level of education.

The number of cases at level 2 (between-individual level) is 31,994[15]; these individuals' data are in all the analyses, as they have at least one response of each variable over the survey's four waves and all the level-2 variables. Individuals with partial data can be retained in the analysis, which, assuming that missing values are missing at random, is important in ensuring unbiased estimation of model parameters (Hox, 2010). At level 1, (within-individual level), the number of observations is 121,566 in model 1 and 121,563 in model 2.[16]

8.1. Model estimated

After assessing differences in use of the nine types of parenting practices according to parents' education level, this study investigates whether parenting practices relate to the child's amount of learning time per week and whether their effects vary by family background. First, using the hybrid fixed effects method, model 1 was created and run without any PI indicators. Second, a random intercept model with the nine types of parental practices was created. This model essentially provides empirical evidence of factors associated with the dependent variable of between and within individuals, generating identical results of a conventional fixed effects model for time-varying variables while estimating effects of time-invariant variables (Allison, 2009). Therefore, all time-varying PI indicators were group-centered and put in level 1 (within-individual level), and means of the variables were included in level 2 (between-individual level). Building on the initial random intercept model, we tested whether any of the nine time-varying PI indicators differently influenced children's learning time depending on parents' SES. Then, a random intercept (between-individuals), *juku* participation (within-individuals), and

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

[15] This number is roughly 94% of the collected responses for Wave 10.

[16] Because of combinations of missing values at level 1, the numbers of observations for level 1 and cases (children) for level 2 included in the descriptive statistics and the two models (Models 1 and 2) are slightly different.

abacus (within-individuals) model was specified as the final model (model 2)[17] because, among the nine PI indicators, only *juku* participation and abacus had differing effects on children's learning time on account of parental education. Using Mplus Version 7.3 (Muthén and Muthén, 1998–2012) with maximum likelihood estimation with robust standard errors, both models 1 and 2 were conducted with multiple imputation of level 1 predictor variables.[18]

9. Results

9.1. Descriptive statistics

Table 1 summarizes descriptive statistics for the variables.[19]

Table 2 reports intra-class correlation of each variable[20]; the length of learning time outside school and the degree of nine types of PIs significantly vary between individuals, ranging from 38.95% (distance learning) to 62.65% (television viewing).

9.2. Parenting practices differentiated by parental education

Table 3 presents means of the variables by parental education for each wave. In addition, a *p*-value is noted for each variable under each grade level, showing the results of analysis of covariance when controlling for children-level variables including annual household income.[21] In accordance with the hypothesis, "parental education" appears to differentiate the nine types of parenting practices even when other variables such as annual household income are controlled, except for father's involvement (PI Father) in third and fourth grade and abacus in fourth grade. Most notably, learning hours per week, two types of shadow education, and three types of extracurricular activities share the same consistent pattern, in which having college-educated parents is associated with longer learning hours and higher participation rates in shadow education and extracurricular activities across the four consecutive waves except for abacus in fourth grade.[22] More concretely, although the participation rate in *juku* increased generally as children grew older, children with two highly educated parents had a greater growth in *juku* participation over time (i.e., from 14.2% in first grade to 32.2% in fourth grade). This pattern, consistent with the hypothesis, also held for "distance learning;" children with one or two college-educated parents were more likely to use distance learning services, and this trend continued over time (for two college-educated parents, the percentage rose from 17.3% in first grade to 33.2% in fourth grade). Similarly, over the observed period, children of college-educated parents participated in more extracurricular activities than their counterparts, except for abacus in fourth grade.

A reverse trend is observed for "hours of TV-viewing per week" and "hours of video-gaming per week." This suggests that college-educated parents appear to organize and control their children's use of time outside school, limiting engagement in such activities.[23] Children with one or two college-educated parents viewed less television (about 1.3 h per week for one college-educated parent and 3 h per week if both parents were college-educated) and played video games for fewer hours than those whose parents had not completed any higher education. While parental education seems to be negatively related to the

[17] Model 2 was built as follows:

Level-1 Model (within individuals): Learning hours per week ti = π0i + π1i(Time ti) + π2i(Number of Siblings ti) + π3i(Housewife ti) + π4i(*Juku* Participation ti) + π5i(Distance Learning ti) + π6i (English Conversation Lesson ti) + π7i(Abacus ti) + π8i(Calligraphy ti) + π9i(TV-viewing ti) + π10i(Video-gaming ti) + π11i(PI Mother ti) + π12i(PI Father ti) + eti

Level-2 Model (between individuals): π0i = β00 + β01(Born in January i) + β02(Female i) + β03(Mean of Number of Siblings i) + β04(Mean of Housewife i) + β05(Parental Education i) + β06(Annual Household Income i) + β07(Mean of *Juku* Participation i) + β08(Mean of Distance Learning i) + β09(Mean of English Conversation Lesson i) + β010(Mean of Abacus i) + β011(Mean of Calligraphy i) + β012(Mean of TV-viewing i) + β013(Mean of Video-gaming i) + β014(Mean of PI Mother i) + β015(Mean of PI Father i) + r0i

π1i = β10, π2i = β20, π3i = β30, π4i = β40 + β41(Parental Education i) + β42(Annual Household Income i) + r4i, π5i = β50, π6i = β60, π7i = β70 + β71(Parental Education i) + β72(Annual Household Income i) + r7i, π8i = β80, π9i = β90, π10i = β100, π11i = β110, π12i = β120

To explain the variation between individuals, the level 2 equation predicts the intercept of level 1, π0i, along with *juku* participation of level 1, π4i, and abacus, π7i. Whereas the other PI indicators are the vectors of measures for the *i*th individual at time *t*. Means of time-varying variables were included at level 2 to give more refined estimates of β05 (parental education) and β06 (household income).

[18] In Model 2 (the full model), the number of observations for level 1 is 121,563 and the number of individual children is 31,992, with multiple imputation of level-1 variables. Without multiple imputation, there are 110,700 level-1 observations and 31,886 individuals included in the model. This indicates that 10,863 level-1 observations within individuals (about 9% of the repeated observations) were imputed, but they are connected to only 106 individuals (roughly 0.3% of the sample). To examine the nature of the missing data further, dichotomous flags indicating the missing value status of observations were created for each predictor and examined to determine whether there were any statistical differences between included observations or cases and missing ones that could affect the outcome. Within individuals (level 1), all of them were tested at $p > .001$ because of the size of the dataset and found to be insignificant. Between individuals (level 2), predictors (e.g., parent education and annual household income) were also examined (at $p > .001$) and found to be statistically insignificant. Given the size of the data, this provides evidence that the missing data can likely be considered as missing at random, suggesting that multiple imputation of missing values was appropriate.

[19] Outliers who are above 3 SD from the mean were removed from "hours of TV-viewing per week," "hours of video-gaming per week," and "number of siblings" and outliers below 3 SD were removed from the mean of "PI Mother."

[20] Using HLM 7.01 (Raudenbush and Bryk, 2002), ICCs were estimated.

[21] Included variables in the analysis of covariance are Born in January, Female, Annual Household Income, *N* of Siblings, and Housewife. The latter two variables are indicated for each grade (e.g., for assessing differences among the three groups based on parental education levels in first grade, *N* of Siblings for that specific wave was used). Table 3 presents unadjusted (raw) means.

[22] The same pattern can be observed when annual household income and other demographic variables (i.e., housewife, number of siblings, female, born in January) are controlled using HLM growth modeling. The reverse trend is also verified for hours of TV-viewing and of video-gaming using HLM growth modeling; i.e., higher parental education is associated with fewer hours of watching TV and playing games.

[23] It should be acknowledged that some television content might be educational.

Table 1
Descriptive statistics of variables (N = 31,994).

	Mean	SD	Min	Max		Mean	SD	Min	Max
Learning hours per week					*Juku participation*				
Mean	6.087	3.897	0	35	Mean	0.168	0.367	0	1
Wave 7	5.043	3.510	0	35	Wave 7	0.108	0.310	0	1
Wave 8	6.008	3.787	0	35	Wave 8	0.131	0.338	0	1
Wave 9	6.218	3.883	0	35	Wave 9	0.188	0.391	0	1
Wave 10	7.078	4.410	0	35	Wave 10	0.245	0.430	0	1
Hours of TV-viewing per week					*Distance learning*				
Mean	13.568	6.707	0	37	Mean	0.206	0.399	0	1
Wave 7	12.409	6.261	0	32	Wave 7	0.123	0.328	0	1
Wave 8	13.175	6.551	0	34	Wave 8	0.214	0.410	0	1
Wave 9	14.042	7.002	0	35	Wave 9	0.246	0.431	0	1
Wave 10	14.648	7.012	0	37	Wave 10	0.243	0.429	0	1
Hours of video-gaming per week					*English Conversation Lesson*				
Mean	4.719	4.275	0	21	Mean	0.144	0.351	0	1
Wave 7	3.866	3.956	0	18	Wave 7	0.140	0.347	0	1
Wave 8	4.446	4.101	0	19	Wave 8	0.142	0.349	0	1
Wave 9	5.289	4.470	0	21	Wave 9	0.146	0.353	0	1
Wave 10	5.275	4.573	0	21	Wave 10	0.150	0.357	0	1
Parental involvement (PI) Mother					*Abacus*				
Mean	5.814	1.741	0	8	Mean	0.079	0.266	0	1
Wave 7	6.102	1.655	1	8	Wave 7	0.045	0.208	0	1
Wave 8	5.941	1.676	1	8	Wave 8	0.074	0.262	0	1
Wave 9	5.819	1.745	1	8	Wave 9	0.095	0.294	0	1
Wave 10	5.394	1.887	0	8	Wave 10	0.100	0.300	0	1
PI Father					*Calligraphy*				
Mean	2.492	2.005	0	8	Mean	0.164	0.368	0	1
Wave 7	2.452	2.018	0	8	Wave 7	0.117	0.322	0	1
Wave 8	2.564	2.020	0	8	Wave 8	0.159	0.365	0	1
Wave 9	2.516	2.002	0	8	Wave 9	0.191	0.393	0	1
Wave 10	2.434	1.982	0	8	Wave 10	0.191	0.393	0	1
Housewife (reference = all others)					*Number of siblings*				
Mean	0.385	0.485	0	1	Mean	1.232	0.708	0	3
Wave 7	0.447	0.497	0	1	Wave 7	1.208	0.704	0	3
Wave 8	0.396	0.489	0	1	Wave 8	1.231	0.706	0	3
Wave 9	0.363	0.481	0	1	Wave 9	1.242	0.710	0	3
Wave 10	0.333	0.471	0	1	Wave 10	1.248	0.714	0	3
Born in January					*Parental Education*				
	0.500	0.500	0	1		0.837	0.824	0	2
Female					*(Logged) Annual Household Income*				
	0.480	0.500	0	1		6.324	0.654	0	9.02

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

Table 2
ICC of time-varying variables (N = 31,994).

	ICC (%)
Learning time	43.90
TV-viewing	62.65
Video-gaming	53.63
PI Mother	52.60
PI Father	61.67
Juku participation	47.62
Distance learning	38.95
English Conversation Lesson	56.68
Abacus	52.94
Calligraphy	54.90

ICC = Intra-class correlation coefficient.

increase in time spent on television or games, the number of hours generally increased as children grew older (except between third and fourth grade for video-gaming). Along with the results regarding the use of shadow education services and extracurricular activities, these findings indicate that highly educated parents organize their children's time more to benefit their children's education with both greater educational opportunities outside school and less television or game time.

Table 3
Means of variables by parental education (N = 31,994).

	1st	2nd	3rd	4th		1st	2nd	3rd	4th
Learning hours per week					*Juku participation*				
0	4.926	5.833	5.988	6.589	0	0.084	0.111	0.150	0.191
1	5.128	6.046	6.290	7.127	1	0.112	0.135	0.194	0.250
2	5.139	6.239	6.497	7.772	2	0.142	0.160	0.241	0.322
p-value	**	***	***	***	*p*-value	***	***	***	***
Hours of TV-viewing per week					*Distance learning*				
0	13.632	14.542	15.612	16.127	0	0.087	0.146	0.168	0.170
1	12.345	13.169	14.053	14.665	1	0.129	0.230	0.260	0.262
2	10.549	11.078	11.613	12.399	2	0.173	0.302	0.352	0.332
p-value	***	***	***	***	*p*-value	***	***	***	***
Hours of video-gaming per week					*English Conversation Lesson*				
0	4.473	5.124	6.077	5.983	0	0.104	0.108	0.114	0.117
1	3.793	4.415	5.222	5.215	1	0.155	0.155	0.156	0.163
2	2.986	3.440	4.160	4.279	2	0.181	0.180	0.186	0.185
p-value	***	***	***	***	*p*-value	***	***	***	***
Parental involvement (PI) Mother					*Abacus*				
0	6.027	5.879	5.715	5.300	0	0.039	0.068	0.088	0.097
1	6.161	5.984	5.878	5.434	1	0.046	0.073	0.095	0.097
2	6.157	5.993	5.914	5.494	2	0.054	0.084	0.107	0.109
p-value	***	*	***	**	*p*-value	***	**	**	
PI Father					*Calligraphy*				
0	2.528	2.645	2.544	2.417	0	0.101	0.136	0.164	0.163
1	2.447	2.553	2.522	2.445	1	0.127	0.168	0.201	0.201
2	2.338	2.453	2.469	2.448	2	0.134	0.183	0.223	0.222
p-value	***	***			*p*-value	***	***	***	***

0, 1, and 2 indicate the number of parents holding an associate degree or higher.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Meanwhile, PI Mother and PI Father demonstrate different trends. Across all three groups, PI Mother (i.e., the extent of the mother's involvement in children's learning at home) decreased over time; however, it is higher for more educated parents across the four waves (except in first grade, where the mean for one college-educated parent was slightly higher than that for two college-educated parents). As for PI Father, the degree of involvement was lower for groups with more educated parents from first to third grade but narrowly higher in fourth grade (i.e., 2.448 for two college-educated parents, 2.445 for families with one college graduate, and 2.417 if neither parent has a college education). These results indicate that parents without college education appear to demonstrate a degree of PI that is closer (or even higher in PI Father) to that of college-educated parents when children are in the first grade. However, the degree of PI by educated parents becomes higher than that of parents without a college education for both fathers and mothers when children reach the fourth grade (Wave 10), while the differences in the degree of PI Father between the groups are not significant in third and fourth grades and the means of each indicator gradually decrease over the years.

9.3. Predicting learning time

The results of the analyses regarding the nine PI indicators essentially show that highly educated parents engage in their children's education outside school during the early elementary school stages in Japanese society. Next, the study assesses whether parenting practices varying depending on parental education background are associated with between-individual differences and within-individual differences in learning time outside school. As presented in Table 3, there are differences in learning time between the three parental education groups, and the differences among the three parent education groups persist even when household income and other factors are controlled. In the first grade, the difference between the groups is not large, but the disparity in learning time between the groups widens as children progress through the education system, especially at the fourth-grade level. "Parental Education" seemingly explains the difference in learning time. Building on these findings, the study attempts to reveal whether the nine PI indicators partly explain who studies longer and children's changes in learning time outside school. In addition, by running two models (with and without the PI indicators), the study assesses whether the PI indicators mediate the relationship between parental education and children's learning time. That is, comparing results of the two models enables us to verify if parental education influences children's learning time through the PI indicators.

Table 4 provides empirical evidence that the inequality in effort becomes exacerbated over time; participating in shadow education (i.e., *juku* lessons and distance learning) and extracurricular activities (i.e., English conversation, abacus, and calligraphy), fewer hours of video gaming (negative coefficient), and higher degrees of the mother's and father's involvement in

Table 4
Predicting learning time.

	Learning hours per week			
	Model 1		Model 2	
	Coef.	SE	Coef.	SE
Within-Individual Level	*N* = 121,566		*N* = 121,563	
Time	0.634***	0.008	0.543***	0.009
N of Siblings	−0.062	0.070	−0.023	0.067
Housewife	0.028	0.037	0.034	0.036
Juku Participation: Intercept			1.723***	0.077
Parental Education			0.254***	0.063
Annual Household Income			0.192**	0.079
Distance Learning			0.173***	0.031
English conversation lesson			0.357***	0.058
Abacus: Intercept			1.338***	0.103
Parental Education			−0.283**	0.085
Annual Household Income			−0.068	0.105
Calligraphy			0.250***	0.047
TV-viewing			−0.004	0.002
Video-gaming			−0.013***	0.003
PI Mother			0.144***	0.008
PI Father			0.105***	0.008
Residual Variances				
Learning Hours	8.157***	0.078	7.231***	0.071
Between Individual Level	*N* = 31,994		*N* = 31,992	
Intercept	4.600***	0.034	4.941***	0.032
Born in Jan	0.249***	0.033	0.142***	0.030
Female	0.533***	0.033	0.587***	0.032
N of Siblings (M)	−0.501***	0.024	−0.174***	0.022
Housewife (M)	0.580***	0.041	0.366***	0.036
Parental Education	0.188***	0.021	−0.023	0.020
Annual Household Income	0.144***	0.030	−0.122***	0.026
Juku Participation (M)			3.352***	0.060
Distance Learning (M)			0.594***	0.051
English conversation lesson (M)			0.926***	0.052
Abacus (M)			1.803***	0.075
Calligraphy (M)			0.312***	0.046
TV-viewing (M)			−0.005	0.003
Video-gaming (M)			−0.028***	0.005
PI Mother (M)			0.444***	0.011
PI Father (M)			0.217***	0.009
Residual Variances				
Learning Hours	6.735***	0.100	4.863***	0.077
Juku Participation			8.103***	0.474
Abacus			3.935***	0.565

Coef. = Coefficient, SE = Standard Error.
** $p < .01$.
*** $p < .001$.

the child's learning at home are associated with both levels and changes in learning time outside school. In other words, eight out of nine PI indicators partly explain the disparity in learning time between children and the widening differences in learning hours over time, whereas television viewing and parental education are not significant predictors of the outcome. Additionally, the effect of *juku* participation varies by both parental education and annual household income. The effect of attending *juku* on learning time is stronger when children have highly educated parents and a higher annual household income. Likewise, the effect of taking abacus lessons on learning time also differs by parental education but not by annual household income. Importantly, as the coefficient of parental education is negative, the effect of abacus lessons is stronger when parents are not college-educated, while taking abacus lessons still increases learning time for children of two parents with college degrees, as the intercept for the abacus variable demonstrates.

In addition, the results of model 1 indicate that parental education is a significant predictor of between-individual differences (level 2) in learning time; the coefficient is 0.188 ($p < .001$). However, with mean scores of all the PI indicators, the coefficient becomes −0.023 and is not significant. These results suggest that the PI indicators mediate the relationship between parental education and children's learning time.[24] Therefore, the disparity in children's learning time depending on parental education is partly derived from the differences in parenting practices according to the level of parent education.

[24] These are largely due to *juku* participation and, to a much lesser degree, distance learning and extracurricular activities. This means that the study's results show only a relation between the other significant PIs (i.e., PI Mother/Father and video-gaming) and learning time, not an association between parental education, these PIs, and learning time in the final analysis.

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 disparity between children and the growing differentials in learning time outside school even during early elementary school years. Compared to *juku* participation, the other type of shadow education service, distance learning, plays a much smaller role in shaping one's learning time in both aspects (between- and within-individual differences), according to a coefficient at each level.

Among the three types of extracurricular activities, taking abacus lessons appears to be the strongest predictor of both between- and within-individual differences in learning time, compared to English conversation and calligraphy. As it is less likely that survey respondents consider the time spent on abacus lessons as part of "learning (*benkyo*) time" outside school, this result could be interpreted as indicating that attending abacus lessons shapes children's dispositions, attitudes, and behaviors; however, this interpretation would need to be verified in future studies.

As for the other four PI indicators, the time spent on games also relates to between-individual differences in learning time, but its magnitude is small, considering that the average number of hours of video-gaming is around 4.7. Meanwhile, the mother's involvement in a child's learning at home seems to have substantial effect on the child's learning time, as the variable ranges from 0 to 8. The father's PI in home learning is also associated with children's longer learning time, even though the magnitude is less than half of that for the mother's involvement. Turning attention to the results of these three 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. In the meantime, television viewing is not a significant predictor of the outcome at the both levels.

10. Discussion

In a society where public budgets in compulsory education are progressively provided across prefectures and between-school differences are relatively small, parental advantages are mainly transmitted to their children outside school. Given the association between learning time and achievement in Japan (Beaton et al., 1996; Matsuoka, 2013; Mullis et al., 1997; Ochanomizu University, 2014; OECD, 2011; Shinogaya and Akabayashi, 2012), the disparities in learning opportunities and learning time outside school could be sources of the achievement gap inside school, leading to differentials in educational attainment. This study attempts to reveal relationships between PI that differs by parental education and children's learning time outside school during the early elementary school years by employing the hybrid fixed effects method with national longitudinal data. As shown in Table 3, college-educated parents tend to engage in parenting practices that overall could be interpreted as "concerted cultivation" (Lareau, 2003, 2011)[25] and "rigorous" parenting (Honda, 2008) when the children are first graders, and this trend persists over the next three 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 as early as the first-grade level, and this group of children's rate of participation is higher over the years than that of children with less educated parents. Additionally, the study finds that highly educated parents engage in parenting practices that organize, monitor, and supervise their child's time outside school, and this trend also persists over the observed years.

Then, the study reveals that these parental education-related parenting practices are associated with the levels and changes in a child's learning time outside school. This extends findings about the relationship between SES and sixth-grade students' learning time (Kaneko, 2004; Otawa, 2008) and the argument that mothers' active approach toward their children's education relates to students' learning time in fifth and sixth grades (Uzuki, 2004) and in the second year of junior high school (Koyama, 2011). The study's results suggest that this effect began even before the higher grades at elementary school, revealing the emergence of inequality in effort. This empirical evidence indicates that the differentials in effort due to parents' educational background already exist when children enter the compulsory education system. In addition, this inequality in effort continues to grow under the influence of PI over the four years, showing how parental advantage is partly transmitted to children outside school in a society with a relatively equitable education system.

It should also be highlighted that the effect of *juku* participation varies depending on SES: children with highly educated parents and a higher annual household income have stronger effects on their learning time of attending *juku*. This may mean that children with college-educated and wealthy parents tend to attend more demanding *juku* intuitions to prepare for prestigious private junior-high school examinations. This could also be interpreted as college-educated parents making sure that their children complete homework assigned by *juku* instructors. Whatever the case may be, the results of this study indicate that children with advantaged families spend longer hours studying outside school, accumulating knowledge, and gaining learning experience in the early years of elementary education.

The effect of taking abacus lessons on learning time also differs according to parental education. Practicing the abacus is not directly related to skills that are immediately evaluated in formal education, but it certainly helps children gain a good

[25] "Concerted cultivation" (Lareau, 2003, 2011) is an overall style of parenting that leads children to have particular dispositions. College-educated parents tend to excise all of the PI indicators assessed in this study (except for PI Father in third and fourth grade and abacus in fourth grade). This overall tendency of the parental involvement is interpreted as "concerted cultivation" and "rigorous parenting" (Honda, 2008), not each PI indicator representing "concerted cultivation" and "rigorous parenting."

grasp of mental arithmetic, which will help them to succeed in math class. In addition to strengthening their math skills, children who take abacus lessons may obtain experience and cultivate dispositions valued by schoolteachers, such as listening to instructors/teachers and focusing on assigned tasks. The reason for the differing effect on learning time (i.e., children with lower parental education spend longer time studying) may be that children with less educated parents had not been exposed to structured lives outside school, and that therefore attending abacus lessons had a greater impact in enabling them to obtain the dispositions than for those children who lived more lives that were consistently organized.

All results of this study together show that children with college-educated parents tend to have more learning opportunities (i.e., shadow education and extracurricular activity participation), to spend less time on non-schoolwork (i.e., video gaming) under, presumably, parents' control, and to receive attention/intervention by parents (i.e., PI mother and PI father). Indeed, this trend persisted over the observed period. In the meantime, children with less educated parents are more likely to receive less outside-school educational opportunities, to spend more time playing video-games, and to have less parental intervention with learning at home in the early years of compulsory education. Without the knowledge and understanding that the differences in these parenting practices that are based on level of parental education relate to children's learning time outside school, how much effort a child exerts would be regarded as "entirely a matter of individual freewill" (Kariya, 2013, p. 127), thus concealing SES effects on educational trajectories.

This study's results indicate whether and how the achievement gap emerge and widen in a seemingly egalitarian society with little between-school disparity. In fact, the magnitude of the inequality in effort is quite substantial when comparing the number of hours that children study outside school with that of the national school curriculum, which is controlled by MEXT. For example, the mean number of hours that first graders study outside school (Wave 7) is 5.043 per week, as Table 1 shows. That totals about 262 h per year (5.043 × 52 weeks), based on the premise that the number of hours children study does not significantly change during summer/winter vacation.[26] Meanwhile, according to the national curriculum guidelines (MEXT), first-grade students spend 289.5 course hours on the main subjects (i.e., national language, which is equivalent to language arts, or English, in the US, and math) for one academic year (386 school hours × 0.75: 45 min per session). As schools are open for only about 35 weeks per year, the number of hours should be compared with caution. However, from this rough calculation, we observe that the number of hours first-grade students study outside school is substantial. This is especially so when looking at the difference between children whose learning time outside school is 1 SD above the mean (about 445 h) and those whose number of hours spent on studying is 1 SD below the mean (about 80 h); the disparity in learning time between them is about 365 h, which is more than the total number of school hours spent on main subjects. When comparing the mean and 1 SD above the mean of learning time, the difference is still about 183 h, which is a substantial exposure to academics.

This difference in hours spent on studying outside school increases over the years. When children reach the fourth-grade level, their average learning time outside school is approximately 368 h per year. The number of hours of instruction on core subjects (i.e., national language, math, social studies, and science) also increases to 420 h (560 school hours × 0.75: 45 min per lesson). Again, when comparing the students who spend 1 SD above and 1 SD below the mean hours outside school, the difference is about 458 h (597 − 139), much longer than that spent on the four core-subject lessons in a school system that offers relatively equal learning opportunities. The difference between the mean and 1 SD above the mean for the year is about 229 h, which could be sufficient learning time to impact fourth-grade students' academic knowledge and skills. The empirical results of this study suggest that the disparity in learning time between students who study longer and those who study less is partly derived from parenting practices that vary depending on parental educational background. This inequality in effort based on social-class PI is likely to continue to grow during the later stages of education and is presumably a major cause of the achievement gap along socioeconomic lines.

11. Implications

11.1. Policy implications

This study reveals the disparity in effort partly due to SES-differences in parenting practices at the early stages of education. Japanese compulsory education, which is progressively funded, may still be highly regarded as offering relatively equal learning opportunities, especially when compared to other societies like the US, which has considerable disparities among school districts. However, even when the centralized system (i.e., MEXT) equalizes and standardizes learning opportunities for all children, advantaged parents attempt to further benefit their children through active parenting practices, and the inequality in effort presents itself in the first grade and continues to grow 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 should be provided to disadvantaged children. In fact, among the nine types of parenting practices, the magnitude of *juku* participation is the strongest, with levels and changes in children's hours of studying outside school, while the other PI indicators except television-viewing are also significantly associated with children's learning time. In addition, parental education significantly relates not only to *juku* participation but also to the effect of attendance on learning time. Taken together,

[26] This is a conservative assumption. "Summer gap" (e.g., Burkam et al., 2004) is likely to be the case; advantaged students attend shadow education lessons and extracurricular cultural activities during vacations, receiving school-like structured learning time with assignments. Meanwhile, disadvantaged children have greater unorganized time.

providing supplemental free lessons for children who cannot afford to attend *juku* institutions may be an option to achieve equality in effort, a condition that should be met to justify "meritocratic" selection. As taking abacus lessons also appears to increase children's learning time, especially for those with less educated parents, disadvantaged children may receive more benefits from additional learning opportunities provided outside school. One example of this policy is the Supplemental Educational Services provided by the US No Child Left Behind Act, although effects of service providers on outcomes vary (e.g., Heinrich and Nisar, 2013). As similar support is already offered at some public schools in Japan (e.g., *Wada* Junior High School located in *Suginami*, Tokyo), this attempt could be extended with more financial support from the central government.

One may think that policies promoting more PI would narrow the effort gap, based on the findings of the study; specifically, it could be recommended that disadvantaged parents actively monitor and supervise their child regarding video gaming, and increasingly engage in their child's learning at home. However, it would be unrealistic to expect positive results that continue for years because lower degrees of PI in their children's education are likely because of fewer resources (e.g., networks and money that would back up their continuous effort), as the literature in the US and Japan suggest (e.g., Chin and Phillips, 2004; Bennett et al., 2012; Honda, 2008; Lareau, 2003, 2011), in addition to working class mothers' negative education experiences that led them to have less confidence about educating their own children (Yamamoto, 2015).

11.2. Research implications

It should be noted that this study's dataset is limited since it does not include information regarding children's cognitive and non-cognitive skills. If children's academic performance had been measured and included in the data used for this study, the relationships between SES, parenting practices, and learning time would likely have remained the same; SES differentiates parental practices that shape children's learning time, which, in turn, influences their academic or school performance. In other words, children's learning time would have mediated the association between SES and academic performance, as Shinogaya and Akabayashi (2012) and the report by Ochanomizu University (2014) found; learning time outside school likely improves children's academic performance, especially in elementary education. Future studies should seek to establish a causal association between these factors.[27]

In addition, the results might have been more instructive had children's learning time been divided into two types: voluntary and under parents' strict control or monitoring. As a result of "concerted cultivation" that develops children's dispositions, attitudes, behaviors, and sense of entitlement, observing whether PI shapes children's study habits would include specifically assessing *voluntary* learning time or academic activity. This study includes the three types of extracurricular activity participation and their relation to between- and within-individual differences in learning time, but admittedly, having these indirect measures of involvement in adult-led structured activities is not sufficient to claim that PI shapes children's dispositions as a direct consequence of "concerted cultivation." Meanwhile, this study's empirical findings indicate that PI is directly (i.e., controlling and monitoring in the forms of shadow education, PI Mother, and PI Father) and indirectly (i.e., facilitating learning in academics by offering extracurricular activities and discouraging video-gaming) related to children's learning time outside school over the observed four time points. This suggests that PI shapes children's learning time, which is likely (1) to improve their academic performance, as Shinogaya and Akabayashi (2012) and the report by Ochanomizu University (2014) indicated and (2) to be internalized in children themselves as learning habits (one aspect of the dispositions evaluated by schoolteachers). If this study had used only cross-sectional data, it would have been difficult to make the latter claim, but the results using longitudinal data indicate that gradual increases in the length of learning time and PI are related to within-individual differences in learning time when unobserved heterogeneity is controlled. Despite these strengths, the study is unable to demonstrate whether using shadow education services (*juku* and distance learning) shapes children's attitudes and dispositions toward studying, or if children have to spend extra time studying due to the services that their parents have chosen for them. If the latter is considered, then the results of the study can be interpreted as follows: SES is related to "concerted cultivation" as an overall parenting style in the form of using a wide range of parenting practices, which, in turn, shape children's learning time. The learning time can also be considered as a product of or as another component of "concerted cultivation" in the Japanese context. College-educated parents tend to ensure that their children study outside school, presumably to help them improve their academic skills and have steady learning habits, as Yamamoto (2015) describes by assessing the two groups of mothers; they do this by employing parenting practices (some of which are captured as the nine PI indicators in this study) to structure, organize, and control children's lives. As this study's empirical findings demonstrate that the eight PI indicators partly explain between- and within-individual differences in children's learning time, advantaged parents who employ these parenting practices (understood as parts of "concerted cultivation") appear to successfully structure and monitor children's learning time (that can be understood as both a product of and another component of "concerted cultivation"). As the data track children only until fourth grade and do not include responses regarding the dispositions that "concerted cultivation" is intended to foster in children, the study is limited but still provides empirical evidence of how the effort gap emerges along socioeconomic lines in Japanese society. Since learning time is associated with academic performance (Beaton et al., 1996; Matsuoka, 2013; Mullis et al., 1997;

[27] While learning time outside school and children's academic ability appear to be related with one another, the causal association between them has not been established with empirical data in Japan.

Ochanomizu University, 2014; OECD, 2011; Shinogaya and Akabayashi, 2012) and continuous effort over the observed period likely helps children to internalize study habits (enabling them to become accustomed to apply a certain level of effort in studying outside school), this study's findings indicate the beginning of the development of an achievement gap along socioeconomic lines. In short, the study demonstrates that college-educated parents tend to organize children's time outside school, leading to more structured learning time (effort) over the years; these children's development of steady studying habits are likely to contribute to their enhanced academic achievement. This can still be considered as a form of inequality, but future studies should further investigate this issue empirically by assessing voluntary and structured learning time separately.

Another limitation is that, while this study finds some mediation effects of the PI indicators on the relation between parental education and children's learning time, they are not strong and, as noted, largely because of *juku* participation and, to a much lesser degree, distance learning and extracurricular activities. Other factors that strongly mediate the association between parents' SES and children's effort should be identified in future studies.

Additionally, this study does not test whether PI in school relates to children's level of effort. Future studies should assess this critical aspect of PI, but it can be provisionally presumed that children's learning time is less likely to be affected by PI in school activities. This is because, as Yamamoto (2015) contends, middle-class Japanese mothers tend to "be skeptical about the ability of elementary teachers at public schools to advance their children's education" (p. 9), and therefore, attempt to help their children with academic matters at home or by using shadow education services and extracurricular activities.

Future studies should address parents' childrearing logic in further detail. This study's empirical findings appear to show that college-educated parents in Japan follow the approach that Lareau (2003, 2011) described as "concerted cultivation" on which Honda's (2008) concept of "rigorous parenting" was based. Although "concerted cultivation" was conceived in the US context, which has features that differ from the educational system in Japan, the parents surveyed in this study appear to show similar patterns of childrearing (e.g., structuring children's lives) by using the private market for educational services, depending on whether the parents have a college education. Although this study has demonstrated that the concept of "concerted cultivation" is applicable to Japanese society, at least in terms of parents' actions as captured by the data, some aspects of childrearing are likely to be specific to Japanese society. In addition, Japan has been experiencing rapid societal changes (e.g., a dwindling birth rate and an aging population with severe fiscal problems) that will likely result in changing educational policies (e.g., furthering the privatization of public education). Future studies should investigate how such changes interact with childrearing and whether educational inequality may be exacerbated through the different practices of parents related to their own level of educational attainment.

Finally, although the study controls time-invariant unobserved heterogeneity by employing the hybrid fixed effects model, there may be some unobserved time-varying factors associated with the nine PI indicators and children's learning time. For example, if highly educated parents teach their child cognitive skills in a specific manner, it would be a time-"invariant" factor that is controlled in this study, but some parents may change their method of teaching their child over time, which is a time-varying factor not controlled for. Further studies need to be conducted to assess the relationship between inequality in effort and the achievement gap while including more time-varying aspects of PI.

12. Conclusion

This study provides empirical evidence of how inequality in effort emerges and widens from the point of entry into compulsory education to the fourth year of elementary education 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 little inequality between schools because of progressively funded public education. Because of the relatively equal elementary education system, the belief in meritocracy could be considered valid, but the current study reveals that social class is related to parenting practices that influence elementary school-aged children's learning time outside school. Advantaged children, who have more learning opportunities, spend less time video gaming, and receive greater parental intervention. Their education probably builds on learning experiences that accumulate over the years outside elementary schools, likely leading to the next cycle of engagement in outside-school learning activities because they are accustomed to spending a substantial amount of time studying. Meanwhile, disadvantaged children, who have fewer learning opportunities, spend a substantial amount of time video gaming at home, receive less intervention from their parents, and thus spend less time studying outside school. The achievement gap may not be realized by parents and students until the first regular examination administered during the first semester of junior high school, but the inequality in learning experiences (including participation in additional adult-led learning opportunities and exerting substantial effort in self-studying) outside school exist from the first grade. This inequality continues to grow and is possibly the source of gaps in academic ability and efforts that subsequently influence children's educational and occupational trajectories.

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