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Fewer school days, more inequality

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ABSTRACT

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This paper examines how the intensity of compulsory education affects the time use and academic achievement of children from different socioeconomic backgrounds. The impact is identified off the school-day reduction of Japan in 2002 that resulted when all Saturdays were set as public-school holidays. An analysis of time diaries and test scores reveals that the socioeconomic gradient of 9th graders' study time becomes 110% steeper and the socioeconomic gradient of 10th graders' reading test scores becomes 20% steeper after the school-day reduction. Intensive compulsory education contributes to equalizing the academic performance of children from different socioeconomic backgrounds, at least for some subjects. *J. Japanese Int. Economies* **39** (2016) 35–52. Hitotsubashi University, Graduate School of Economics, Naka 2-1, Kunitachi, Tokyo 186-8601, Japan; Research Institute of Economy, Trade and Industry, Japan; Tokyo Center for Economic Research, Japan; IZA, Germany .

1. Introduction

One purpose of compulsory education is to assure uniform educational opportunities for all children, regardless of their socioeconomic backgrounds. Indeed, a few studies show that expanding the years of compulsory education reduces the dependence of children's educational attainment or risk

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attitudes on their parents' educational attainment (Meghir and Palme, 2005; Aakvik et al., 2010; Hryshko et al., 2011; Brunello et al., 2012). How then does the intensity of compulsory education affect the intergenerational dependence of educational attainment? This is an important question to address, because policymakers select the national curriculum and determine the intensity of compulsory education. Only a few studies, however, examine the effect of the intensity of compulsory education on the intergenerational dependence of educational attainment.

This paper demonstrates that intensive compulsory education homogenizes children's time for studying and dampens the effect of parental socioeconomic background on their children's academic performance, at least in some subjects. This idea is related to previous research findings indicating that the socioeconomic gap of students' achievement widens after summer breaks, because the out-of-school environment is more heterogeneous by socioeconomic status than the in-school environment (Downey et al., 2004; Alexander et al., 2007). A strand of related literature examines the "incarceration" effects of schooling (other than cognitive ability) on youth behavior, such as the increase in property crimes committed by youth on off-session days (Jacob and Lefgren, 2003) and the reduction of teenage pregnancy resulting from more years of compulsory education (Black et al., 2008).

To examine the effects of the intensity of compulsory education on children's time use and academic performance across socioeconomic classes, this study uses the school-day reduction in Japan that took place in 2002 for identification. For the purpose of reducing the time pressure on students and attaining 2 full days off per week for public-school teachers, the Japanese government set all Saturdays as holidays starting in April 2002, whereas half-day instruction had been given on the first, third, (and fifth) Saturdays of each month before the policy change. This study examines the change of time use of 9th graders who are subject to compulsory education and preparing for the high-school entrance examination, using data from the 1996, 2001, and 2006 waves of the Survey of Time Use and Leisure Activities (*Shakai Seikatsu Kihon Chosa*), or popularly called the Japan Time Use Survey (JTUS), which includes the time diaries of the second and third weeks of October in each survey year, as well as background variables for all household members. I furthermore assess the policy change's effect on students' academic performance, drawing on the 2000 and 2003 waves of the OECD Programme for International Student Assessment (PISA), which targets 10th graders.

The analysis of the JTUS data reveals that students' time for studying on Saturdays declined by one third from 2001 to 2006, on average, but the decrease of study time was more significant among children with less-educated parents, effectively making the socioeconomic gradient of study time 110% steeper. This increased socioeconomic gap of study time resulted in a wider gap in test scores: The socioeconomic gradient of reading scores became 20% steeper after the policy change. These results imply that study time is a valuable input for disadvantaged students' academic achievement, at least in some subjects, and that time-intensive compulsory education contributes to reducing the gaps of academic achievement among the various socioeconomic classes.

This paper also contributes to existing literature on the intergenerational dependence of socioeconomic status in Japan (Kariya, 2001; Tanaka, 2008; Ueda, 2009; Hojo and Oshio, 2010; Yamada, 2011); the analysis demonstrates that study time is an important channel of this dependence and that the intensity of compulsory education determines the degree of the dependence.

2. Family background, students' time use, and academic performance

In this section, I lay out a simple model that conceptualizes the relationships among students' family background, time use, and academic performance to motivate the empirical analysis. I employ simple functional forms for the purpose of exposition, but it should be clear that the model's basic logic is robust to alternative assumptions.

I assume that a parent maximizes the utility function by choosing her child's time spent on studying, t, given the resources for her child's education, p. The parental resource, p, refers to parental human capital that contributes to the production of a child's human capital or a child's innate ability inherited from the parent. The utility function consists of her child's test score, y, and her child's study time, t. I assume that the parent feels the pain of her child's studying and that this is the only cost of letting her child study. By assuming that the marginal cost of studying does not depend on parental resources, I abstract away from the heterogeneity of the cost of studying (in the later discussion, I