



All work and no play? The effects of ability sorting on students' non-school inputs, time use, and grade anxiety



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ABSTRACT

How students' non-school inputs respond to ability grouping may explain the currently mixed findings in the literature about the impacts of tracking. Using data from South Korea, where students are randomized into middle schools under the country's equalization policy, but sorted into different high schools on the basis of achievement in some non-equalization policy areas, I find that under ability sorting, students' demand for private tutoring, self-study time, and grade anxiety levels are lower, and their hours of sleep and leisure are higher. The effects on private tutoring are particularly significant for high achievers, while the effects on self-study and leisure hours are strong for low achievers. The results potentially help reconcile the mixed findings in the ability grouping and tracking literature.

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1. Introduction

A growing number of secondary schools are placing students into an ability-heterogeneous learning environment. The Programme for International Student Assessment (PISA) data show that secondary schools that mix students of different abilities in mathematics classes in the Organisation for Economic Co-operation and Development (OECD) countries increased from 33 to 50 percent between 2003 and 2009.¹ The evidence about the effects of ability grouping or tracking

on student outcomes is mixed.² Although recent experimental evidence by [Duflo, Dupas, and Kremer \(2011\)](#) shows that tracking increases the achievement of Kenyan first graders over the entire ability distribution, observational studies tend to show mixed effects of ability grouping and tracking on student outcomes in other countries and educational levels (e.g., [Betts & Shkolnik, 2000a](#); [Figlio & Page, 2002](#); [Hahn, Sung, & Baek, 2008](#); [Kim, Lee, & Lee, 2008](#); [Rees, Brewer, & Argys, 2000](#)).

It is challenging to draw causal inferences about the relationship between tracking and academic achievement of students. Besides the empirical concerns of selection and endogeneity, students and parents may adjust their educational inputs outside of schools when the students are placed in

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¹ Chile, Estonia, Israel, and Slovenia are excluded in the calculation because data are not available in 2003. A similar pattern also appears for other non-OECD countries.

² I use ability grouping and tracking interchangeably and ability grouping is distinguished from ability mixing.

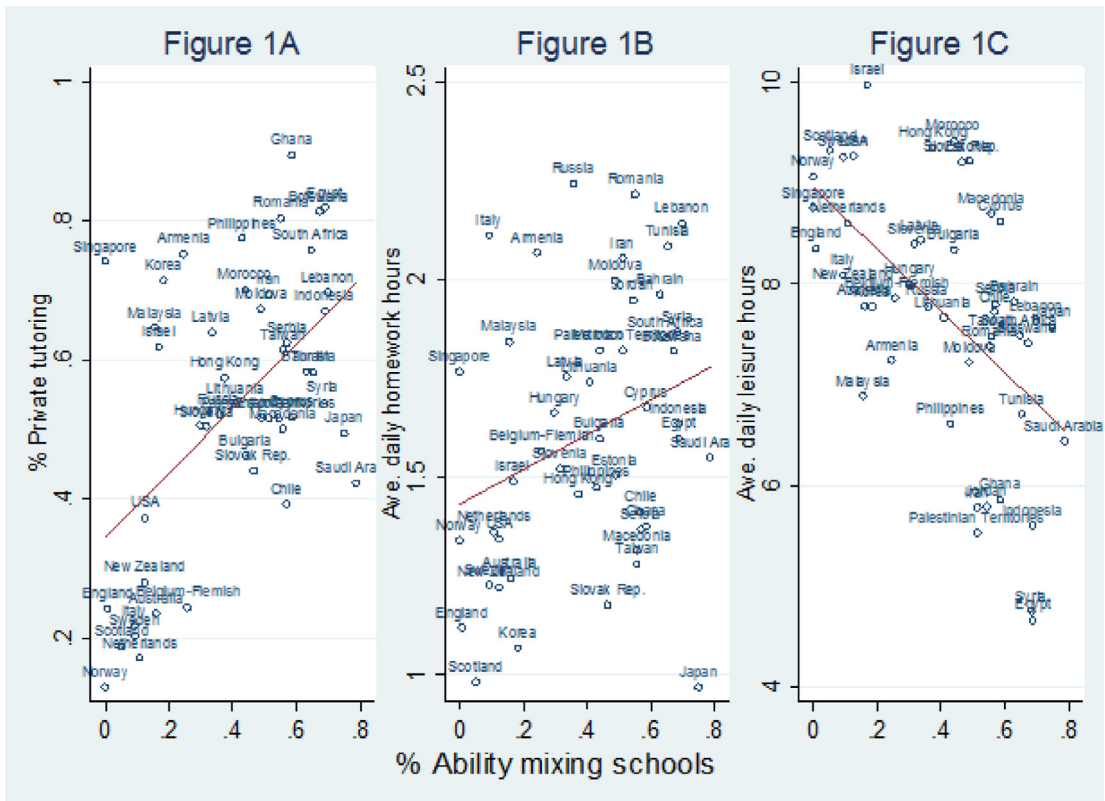


Fig. 1. Cross-country scatter plots of non-school inputs and time use against prevalence rates of ability-mixing schools.

Notes: I compute the correlations using data sourced from the Trend in International Mathematics and Science Study (TIMSS) 2003. The sample includes 47 nations and territories. Ability-mixing schools are those that use the same curriculum and the level of difficulty for all students in both mathematics and science classes. The y-axis of Fig. 1A is the fraction of students who claimed to have taken at least some extra mathematics or science lessons outside of school. The y-axis of Fig. 1B is average hours spent on homework during a normal school day. The y-axis of Fig. 1C is the average hours spent on leisure during a normal school day (time spent on leisure includes time spent on watching TV, playing computer games, playing or chatting with friends, playing sports, reading for enjoyment, and using the internet; leisure hours are top coded at 16).

an ability-heterogeneous learning environment.³ For example, students may undertake more private lessons and study longer hours at home to supplement the learning that occurs in school if learning becomes less effective in an ability-heterogeneous classroom. It is also possible that some students engage in less private tutoring and exert less effort at home when they feel less competitive pressures from their peers in an ability-heterogeneous learning environment. We may also expect secondary school students to be more responsive to changes in their learning environment than primary school students, as the stakes associated with examinations are generally higher and learning materials are more difficult at the secondary school level. These effects may be present whether the heterogeneity is introduced in a randomized, controlled manner or not. Thus, the effect of ability grouping on achievement may be muted or amplified; and ability grouping may also either reduce or increase time and money that students spend outside of schools. In fact,

the Trend in International Mathematics and Science Study (TIMSS) indicates that eighth graders in countries with higher fractions of ability-mixing schools have higher private tutoring participation rates (Fig. 1A), higher average times spent on homework per day (Fig. 1B), and lower average times spent on leisure per day (Fig. 1C). Therefore, in weighing the relative benefits and costs of changing the ability mix of a school or classroom, it is important to consider the responses of students' non-school inputs and time use.

This paper uses the Korean Education and Employment Panel (KEEP) survey data to examine whether private tutoring, self-study hours, hours of sleep, participation in leisure activities, and anxiety levels of secondary school students vary when their learning environment switches from an ability-heterogeneous one to an ability-homogenous one. In South Korea (hereafter Korea), middle school students are randomized into different schools within school districts under what the country calls its 'equalization policy'. As the students move from middle schools into high schools, however, only students living in high school equalization policy areas are subject to randomization within their school districts. In non-equalization policy areas, students sort into different schools based on their high school entrance examination performance. Thus, within-school student ability is

³ For example, countries and schools that implement ability-mixing classrooms may also simultaneously improve teacher quality and reduce class size, which benefit students. See [Betts and Shkolnik \(2000b\)](#) and [Figlio and Page \(2002\)](#) for the empirical challenges in identifying the effects of ability grouping on achievement.

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