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The effects of ability grouping on student achievement and resource allocation in secondary schools

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Abstract

A school policy of grouping students by ability has little effect on average math achievement growth. Unlike earlier research, this paper also finds little or no differential effects of grouping for high-achieving, average, or low-achieving students. One explanation is that the allocation of students and resources into classes is remarkably similar between schools that claim to group and those that claim not to group. The examination of three school inputs: class size, teacher education, and teacher experience, indicates that both types of schools tailor resources to the class ability level in similar ways, for instance by putting low-achieving students into smaller classes. [JEL I21] © 1999 Elsevier Science Ltd. All rights reserved.

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1. Introduction

The value of ability grouping in schools is a subject of much debate. Supporters of ability grouping argue that there are efficiency effects to be gained for all students by putting similar students into classes that can be tailored to their abilities. However, opponents of ability grouping argue that there are also peer group effects so that the achievement of a given student depends not only on his or her initial ability, but also on the average ability of the class. Thus, having high-achieving and motivated students in the class raises everyone's level of achievement, and by grouping, schools essentially harm the lower ability students by separating them from the high ability students. The peer group effect includes potential harm done to test scores of low ability students due to lowered expectations and self-esteem.

Previous research using large data sets can be classified into three types (for a review of the ethnographic research, see Gamoran & Berends, 1987). The first type of study compares students in the academic track to those in the same school who are in the general and/or the vocational track. The second type compares students in schools that group to students in non-grouped schools. A third and more recent approach compares students in high, middle, and low ability groups to ungrouped or heterogeneously grouped students (ungrouped and heterogeneously grouped are used interchangeably).

Studies that compare high to low groups overwhelmingly find that those in high groups have higher math achievement (see Alexander & McDill, 1976; Gamoran, 1987; Vanfossen, Jones & Spade, 1987, for example). Gamoran (1987) uses the vocational track as the omitted category and finds much within-school variation. Even studies that conclude that ability grouping has no effect on a variety of student outcomes find effects of ability grouping on math achievement growth (see Jencks & Brown, 1975; Alexander and Cook, 1982).[1] Although

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[1] Alexander and Cook (1982) find that tracking has no effect on outcomes such as verbal achievement, grade point average,

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many studies of this type control for initial ability by including lagged test scores, types of courses taken, socioeconomic status, and other background variables, it is likely that there are other factors such as motivation and effort that affect both group placement and math achievement.

One solution, used in the second type of study outlined above, is to compare mean achievement of students in schools that use homogeneous grouping to that of students in schools with heterogeneous grouping. Slavin (1990) finds that ability grouping has little or no overall effect on achievement. However, Hallinan (1990) notes that the studies reviewed by Slavin compare the *mean* achievement growth in each type of school, not the distribution. She argues that if there are differential effects to grouping, then when high ability students gain and low ability students lose, the net effect could still be zero.

Ideally, we want to assess how the students in the various levels of grouped classes would fare if they were moved to heterogeneous classes. The third type of study in the literature attempts to address this problem by comparing students in each of the different ability group levels to students in heterogeneous classes. Using British data, Kerckhoff (1986) compares high, middle, low, and remedial students at grouped schools to a reference category of ungrouped students, using several lagged test scores to control for initial ability. He finds evidence for the differential effects theory: students in the high ability class do better than the average student at an ungrouped school, and students in a low ability class at a grouped school do worse than the average student at an ungrouped school. Hoffer (1992) and Argys, Rees and Brewer (1996) also find evidence for differential effects.

Hoffer (1992) uses Longitudinal Study of American Youth (LSAY) data to compare high, middle, and low grouped classes to heterogeneous classes. He finds that being in a high group has a positive effect and being in a low group has a negative effect, with a net effect of zero. In order to compare the high grouped students to their counterparts at a non-grouping school, he uses a propensity score method, in which he runs an ordered probit to model group selection using only the grouped schools, and then using the resulting coefficient estimates, calculates a propensity score for heterogeneously grouped students as well as the homogeneously grouped students. He ranks the students based on their propensity scores and then divides them into quintiles. In this way, he can compare grouped and non-grouped students who have similar backgrounds and who thus fall into the same propensity quintile. He runs a separate regression for each quintile, but within the quintile he again compares high, middle, and low grouped students to the average heterogeneously grouped student, and again finds evidence for differential effects of grouping.

Hoffer's indicator for grouping is based on teacher interviews, school documents, and when necessary, phone calls to the schools. He divides students into four groups: high, medium, and low ability classes in grouped schools, and *all* students in schools which claim not to use ability grouping. Although teachers at all schools in his sample report on class ability, Hoffer categorizes classes in non-grouped schools as heterogeneous. The students at non-grouping schools are the control group against which he compares the progress of students in classes at the three ability levels at grouped schools. Here, we argue, it might be better to compare grouped to non-grouped students within class ability levels, since teachers' observations of class ability may do more to control for unobserved heterogeneity than even the propensity score method.

Argys, Rees and Brewer (1996) also use a two step procedure to account for selectivity into the various classes. Their first step is a multinomial logit for group placement, using high, middle, and low grouped classes, with the heterogeneously grouped students as the omitted category. From the multinomial logit model, they obtain an inverse Mills ratio for each observation, and include it in the separate test score regressions for each of the four groups. They calculate predicted achievement for each group, and also find differential effects: grouping helps the above average and average students, but harms the below average students, as compared to the heterogeneously grouped students. Argys, Rees, and Brewer address not only the differential effects of ability grouping, but also the other important question in the literature: the overall mean effect of ability grouping on achievement. They conclude that ability grouping has a small positive net effect on achievement.

In sum, past studies which compare students from different ability groups to heterogeneously grouped students find evidence that the top students are helped by ability grouping and the bottom students are harmed, resulting in a net effect that can be positive or negative, but which is usually close to zero.

The goal of this paper is to analyze both the overall effect and the differential effects of a formal policy of ability grouping. Ideally, one would like to compare high ability students at grouping schools to their high ability counterparts at non-grouping schools, and likewise for middle and low ability students. Accordingly, this paper furthers the research by controlling for class ability at *each* type of school to estimate math achievement growth for each group. A second major contribution of

English achievement, and American history achievement, while finding effects on quantitative SAT, senior year educational plans, and application to college. Jencks and Brown (1975) find little effect on vocabulary, total information, reading comprehension, abstract reasoning, and arithmetic computation, while finding effects on arithmetic reasoning.

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