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Peer group effects in education production: Is it about congestion?

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Abstract

This paper provides empirical evidence that the achievement growth of lower secondary school students is negatively affected by the presence of classmates from dissolved families. The results, which come from the lower secondary school in Norway, do not seem to reflect non-random allocations of parents, students, or teachers across classrooms. The purpose of the subsequent analyses is to shed light on the underlying mechanisms: is the revealed peer group effect mediated through congestion a la Lazear [Lazear, E.P., 2001. Education production. Quarterly Journal of Economics 116, 777–803]? No decisive evidence is provided, but there are some indications that congestion may be part of the explanation.

JEL classification: J12; J13; I20

Keywords: Family structure; Peer group effects; Student achievement

1. Introduction

Are peer group effects important in classroom education? This long-withstanding issue is becoming increasingly important as policy reforms expose the educational sector to market forces. Many actors, on both sides of the market, seem to *believe* that peer group effects are important: we are witnessing that parents seek schools with favorable student body compositions for their children, and that school boards are 'cream skimming' among applicants.

The existing empirical evidence provides some support for the existence of peer group effects. There are a small number of studies by economists; mostly focusing on the potential effects of

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classmates' *performance* on individual student's performance, which show that peers exercise significant, but rather small, influences on classmates (see for instance Summers and Wolfe, 1977; Henderson et al., 1978; Hoxby, 2000; Robertson and Symons, 2003; Hanushek et al., 2003). Sociologists seem to agree that the *school's average socioeconomic status* is a determinant of the learning environment (see Gamoran, 1992).

These studies provide some crude information about the existence of peer group effects that might be sufficient for many people in many situations. However, the reduced form equations that are estimated reveal very little about the underlying student interactions. Neither is these studies guided by much theory about how individual students are affected by their class- or schoolmates. Policy making would surely gain from more knowledge about the origins of peer group effects.

In a quite recent theoretical contribution, Lazear (2001) has introduced congestion as the most likely mechanism generating peer group effects in the classroom. In his model, the peer effects are thought of in terms of negative externalities; that is, the ability of one student to get something out of a moment of class time depends on the behavior of other students in the class. Lazear provides disruption as an example: when one student misbehaves, the entire class suffers. As spelled out by Lazear, this theory has the potential of explaining many aspects of education production. Empirical investigations directed towards congestion mechanisms may therefore be valuable. The present paper is an attempt to explore such mechanisms.

It is realized that the identification of behavioral effects is difficult, partly because the simultaneity problems are likely to be severe, but also because the effects of classmates' behavior on individual student's performance cannot easily be separated from teacher quality. Credible results can be established only if we – as a minimum – have access to exogenous determinants of student misbehavior. The solution proposed in the present paper is to use the fraction of students from dissolved families as a measure of student misbehavior in class. The idea that student misbehavior may originate from family dissolution is based on a number of earlier empirical studies that have studied the consequences of family dissolution. Examples are Sandefur et al. (1992), Painter and Levine (2000), and Ermisch and Francesconi (2001). All these contributions seek to provide evidence that there is a causal link between family structure and youth behavior such as the probability of attending college and dropping out of high school. A causal relationship is not necessary for the present paper. A correlation between family dissolution and student misbehavior in class is sufficient. Evidence that such correlations are present in the data applied here is presented below.

The present analysis is not the first empirical analysis of potential externalities related to family dissolution. Pong (1998), applying a sociological approach, finds a detrimental effect on 10th grade mathematics and reading achievement associated with attending a school with a high concentration of children from single-parent homes. Pong focuses on school-based social capital and economic resources as mediating channels between student achievement and family structure, and she does not link family structure to student misbehavior and potential congestion effects.

In Manski's language (Manski, 1993), the present paper provides an investigation of contextual interactions, that is, whether the propensity of a student to behave in some ways varies with exogenous characteristics of the group members, here the fraction of students that come from dissolved families. Concentrating on exogenous instead of endogenous peer group characteristics (such as the average achievement level) has obvious advantages. Nonetheless, simultaneity problems will be present to the extent that students from dissolved families are non-randomly allocated across classrooms, or to the extent that parents selectively choose schools based on average family characteristics in schools. In addition, there is a potential problem of non-random allocations of teachers across classrooms and schools. The proposed solutions to these problems are laid out in Section 2.