

Research brief

Parents: substitutes or complements to the school environment?

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Despite the large number of empirical studies estimating the importance of parents in education production functions, few researchers have attempted to account for the potential interactions between school inputs and parents. These interactions, such as households re-optimizing their behavior in response to school policies, have direct implications for the implementation and evaluation of education policies. Researchers may have failed to find significant impact of school resources on achievement by neglecting substitution effects from parents. While increasing resources may improve school quality, if parents respond by reducing effort, the estimated effects of resources will likely be biased downward.

To address this gap in the literature, this paper investigates whether parents are substitutes for or complements to the school environment. More specifically, this paper aims to extend the literature on parental roles by assessing how parents respond to teacher and peer quality.

Intuitively it is not obvious if parents will act as substitutes or complements depending on the characteristics of their kids' teachers or peers. On the one hand, we can imagine that better teachers would do a better job in getting parents involved, thus motivating parents to participate more in their kids' education. On the other hand, a better teacher can make parents believe their children already have all the attention they need and lead them to participate less. The opposite would apply to weaker teachers who may not be effective in involving parents or whose classroom would be viewed as having fewer resources, leading parents to participate more. Characteristics of peers can also affect how parents participate. For example, teachers of classes with a higher proportion of high achievers might reduce time spent on reading and math and increase the time allocated to activities such as arts and physical education. As a result, possibly allowing parents to reduce the time spent on out-of school activities. At the same time, a higher proportion of high achievers might also instigate teachers to teach more complex subjects and assign more homework, leading to a demand for more parent effort.

The main empirical problem in measuring the effect of school inputs on parent participation is that the allocation of students to different schools, teachers, and peers

may be the result of decisions undertaken by schools and parents based on factors that may be correlated with parents' participation. For example, active parents—who are more likely to get involved—may place their children in schools or classes with better teachers and peers. In this case, a simple cross-sectional analysis would be biased both by endogeneity of teacher and peer quality with respect to parental involvement and by omitted variables.

To overcome the endogeneity and omitted variables problems this study takes advantage of a unique micro panel dataset of Brazilian students (*Prova São Paulo*, data from São Paulo municipal schools) to estimate student fixed-effect and fixed-effect-instrumental-variable models. The use of student fixed effect controls for all time-invariant individual and family characteristics that might be correlated with parental participation and allocation of students to school inputs. The instrumental variable approach controls for the remaining possible time-variant characteristics that are not exogenous to parental participation and student selection to school environments.

The measures of parent participation used in this analysis account for the two different dimensions of parental time allocation described in Hanushek (1992) by investigating parent participation at the home (private) and at the school level (public). This study conducts separate analyses for Cycle I (1st to 4th grade) and Cycle II (grades 5-8) because of the dynamic differences between them, such as number of teachers, curriculum and method of learning, use of time and space at school, parental roles and participation.

Overall, results for parent participation at home show that parents in Cycle I are substitutes for the school inputs investigated here. Parents respond negatively to more experienced teachers, higher Portuguese peer achievement, peers whose parents have higher incomes and teacher value added, both for math and Portuguese. On the other hand, parents respond positively to a class with higher standard deviations in Portuguese scores, which also indicates substitutability. Cycle II parents seem to substitute for peers whose parents have higher incomes and complement to more experienced Math teachers.

Parent participation at the school level can vary according to the input analyzed. In Cycle I they substitute for peers whose parents have higher incomes, but serve as complements to peers whose parents have more education. Cycle II parents substitute for more experienced math teachers, higher Portuguese peer achievement and peers whose parents have more income; while serving as complements to more experienced

Portuguese teachers, classes with a greater dispersion of Portuguese scores and peers whose parents have more education.

Although these results are far from exhaustive, they have important implications for policy and further research. Studies that fail to account for parent participation as a time-variant variable in the education production function are likely to be biased. Moreover, policy makers can take into consideration parent substitutability and complementarity when planning, implementing and assessing the effect of educational policies. Policy makers may also want to focus on measures to increase parent participation while increasing government provisions.