Research Statement

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My research approach

My research uses modern applied econometric methods to understand how educational achievement and equality at school could be improved. I am focused on producing policy-relevant studies. The specificity of my research approach stems from my knowledge of the field. It makes me very creative in finding neat instruments for causal identification, while my network opens me access to unique datasets. Generally speaking, my view of policy-relevant research is to look for unexploited datasets to provide new empirical evidence with simple, easy to communicate methods implemented thoughtfully, rather than using complex tools on largely investigated datasets.

Background

My passion for education topics appeared during my undergraduate studies in biology and medical studies at the *Ecole normale supérieure* in Paris. In these years, I founded a non-profit organization to help high school students from disadvantaged background to prepare for higher education studies, which I managed during 7 years (until December 2013). My work with principals, teachers, students and educational policy-makers brought me a keen knowledge of the educational field. At the same time, this experience made me realize how crucial it was for society to evaluate policies in the most rigorous way possible. As a result, I decided to change completely my career track to start graduate studies in social sciences. I finally chose economics for the powerful quantitative toolkit it provides to analyze, evaluate and design educational policies.

My dissertation

My PhD dissertation is about the role of educational context on academic achievement and school inequalities. My job market paper, *"Persistent Classmates: How Familiarity with Peers Protects from Disruptive School Transitions"* (joint with Arnaud Riegert, PhD student at PSE/CREST) shows how important it is for low-achieving students to keep some former peers in their class as they move to new environments, as during transition from middle to high school. To identify the causal effect of peer characteristics within classrooms, we exploit rare natural experiments where principals allocate randomly some students to their classes. We find that low-achieving students with low-socioeconomic status benefit a lot from getting additional "persistent classmates", i.e. classmates who were already in their class during middle school. The effect is strong and persistent during high school, and very robust to controlling for other peer characteristics. By assigning such students at risk of underachievement with a reasonable amount of their former peers, we show that principals could decrease their retention rate and increase high school graduation rates by 13%, at no cost.

"Stereotypes, Discrimination and the Gender Gap in Science" (with Thomas Breda, PSE) examines the role of examiners in the gender segregation across academic fields (Revised & Resubmit at the American Economic Journal: Applied Economics). We exploit a unique dataset on entrance examinations at a prestigious French higher education institution, the *Ecole normale supérieure* of Paris. Each candidate has to take a battery of oral and written tests in several subjects that are more male- or female-dominated (e.g. physics vs. chemistry, philosophy vs. foreign languages).

Using a difference-in-difference-in-differences strategy, we are able to identify examiners' gender bias. The results show that the bias goes on the "wrong" direction, meaning that females (males) are favored in male-dominated (female-dominated) subjects. Therefore, we suggest that policies to increase female representation in top scientific positions should focus more on the lower supply of females.

"A New School in Town: School Openings, School Choice and Academic Achievement" is my most recent paper on new school openings. All developed countries spend a large share of their investment budget to build and open new schools in areas where existing schools are overcrowded. There is almost no evaluation of how these investments do impact students in developed countries, settings where children have already access to schooling anyway. Using a dataset on all middle school students in the Paris region, I look at the impact of opening on new school on students living in its neighborhood. I use a difference-in-differences strategy to evaluate the impact of new school openings. After a new public school opens in the neighborhood, families are 18 % less likely to opt for a private middle school, most likely because of the new geographic proximity to a public school. This result has important implications, as identifying the determinants of private school choice is key for understanding how the private sector contributes to the inequality of educational contexts.

Other papers and work in progress

In collaboration with Arnaud Riegert, I am also working on the measurement of segregation. While most studies only measure the magnitude of school segregation at a given point of the curriculum, there is almost no empirical investigation of the degree to which a given student is isolated from racially or socially different students over time. Yet, such analysis is badly needed if we are to fully evaluate the ability of school systems to bring diversified interactions to students. The objective of this paper is to develop segregation indices that account for "Social environment mobility", in parallel to the literature on income inequality and income mobility.

Three other works are in progress. First, with Eric Maurin and Arnaud Riegert, we evaluate a field experiment on a mentoring program for high school students from disadvantaged backgrounds. Second, with Thomas Breda and Clémentine Van Effenterre (PSE, PhD student), we explore when the gender gap across fields appears or increases during the school curriculum. We attempt to identify when stereotypes lead females to exit sciences, and how school and non-school contexts may influence both gender stereotypes and students' choices of major. Third, I start a work with Manon Garrouste and Meryam Zaiem (both CREST) to investigate how local supply of schools and tracks (vocational or general studies) may influence students' choices between general or vocational studies, using new openings of general or vocational high schools in neighborhoods.

In the future

In the years to come, I plan to pursue research on the role of contexts in students' well-being and achievement, with a particular focus on factors of emotional comfort and security (in line with my findings on familiarity with peers and geographic proximity to school). An important issue is how to find a satisfactory balance between human basic needs for emotional stability and democratic objective of social mixity.
The other research program I would like to start pertains to the use of online technologies by students and teachers. I am the co-founder of a start-up developing educational mobile and web apps for students and teachers, to help them using new technologies in an easy and efficient ways. These apps will include machine-learning systems generating big data on teachers and

students preparation, providing unique perspectives on how online education can improve educational outcomes.