Research statement

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My main research interests are in Economics of Education, Labor Economics and Microeconometrics. My current research focuses on school choice, which it attempts to study under various perspectives. On the application side, my work focuses on assignment mechanisms used by school districts to allocate available seats to students. On the admission side, my research considers the effects on students’ outcomes of admission to one type of selective schools, elite schools, as well as on the mechanisms underlying these effects.

Empirics of school choice and centralized assignment mechanisms

My job market paper, “The value of information in centralized school choice systems”, shows that a simple modification of assignment mechanisms based on the deferred acceptance (DA) algorithm can improve the quality of student-school matches. The DA (Gale and Shapley, 1962) is one of the most extensively used algorithms to assign students to schools around the world. In the US, it has been used in New York City since 2003 to assign students to high schools, by Boston Public Schools since 2006, and in Chicago since 2009. Abroad, Chile, Norway, Spain, Taiwan, Tunisia, Turkey, etc. use a DA-based mechanism to assign high school graduates to university programs. The use of DA-based mechanisms has been advocated over alternative mechanisms (Abdulkadiroğlu and Sönmez, 2003; Balinski and Sönmez, 2003) on the grounds that, when students are allowed to list all the alternatives of the choice set in their application rankings, it is strategy-proof and eliminates justified envy (Dubins and Freedman, 1981; Roth, 1982). However, in virtually all places where DA-based mechanisms are implemented, students are restricted to list only a small number of choices. When the length of her application list is restricted, a student may actually be rejected from all the academic programs she applies to. As a consequence, students need to take into account their admission chances to the programs, and be strategic in their choice (Haeringer and Klijn, 2009; Calsamiglia, Haeringer and Klijn, 2010).

In my job market paper, I empirically examine the effect of enabling students to update their expectations about their admissions probabilities. Taking restrictions on the number of applications as fixed, I investigate how providing students with information can improve the quality of school-student matches. Doing so, I consider a simple information provision design that can be easily embedded in commonly implemented DA-based assignment mechanisms. The standard (one-phase) implementation of the DA involves the whole cohort of \( N \) students simultaneously submitting their application lists, and then being assigned via the DA. In contrast, I consider

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a sequential implementation, which involves first partitioning the cohort in \( K \leq N \) assignment groups that successively submit lists and are assigned. After a group is assigned, and before the next group students submit their application lists, information about which vacancies remain and which programs filled up is publicly updated. To quantify the gains in student welfare from the updating allowed by such informational updates, I estimate a model of school application portfolio choice, and use my estimates in a counterfactual exercise. In the model, students can be strategic in their choices, and may not know their true admission probabilities. To deal with the empirical challenge of identifying students’ preferences for programs when observed choices are the result of expected utility maximization, I use administrative data from Tunisia, where high school graduates are assigned to university programs using a three-phase sequential variant of the DA. I show that the revelation of information gives incentives to a subset of applicants to simply list their most-preferred programs in their application portfolio. From these students, I recover population utility parameters using standard discrete choice techniques. In a second step, I use other students’ application portfolios to identify applicants’ expectations about their admission chances; expectations rationalize submitted lists given utility parameters. I find, that, when students cannot revise their expectations, and relative to a benchmark situation in which students are given perfect information about which programs would admit them, their average indirect utility is decreased. The utility loss is economically significant; it is equivalent to a 41km-increase in the distance home-university –40% of the median distance traveled by students in the data. While easy to implement, the sequential implementation of the DA procedure reduces this expected utility loss by 67% in Tunisia, and drastically decreases the share of students getting rejected by all their listed choices. Gains disproportionately accrue to low-ability and low-SES students, and counterfactuals suggest that a better targeting of low-priority students by the information provision would lead to larger welfare gains.

In my job market paper, I take as given and fixed the restrictions placed on the number of alternatives students can list in their application portfolio –as this is the case in virtually every school choice implementation of the DA. There is evidence that while they value the strategy-proofness implied by the DA when no constraint in imposed on the size of the application portfolio, policy-makers have proved to be unwilling to lift list size restrictions (Pathak and Sönmez, 2013; Roth, 2015). In future work, I plan to investigate the reasons behind this reluctance. In settings where the choice set faced by students is large (such as in Tunisia, but also for instance in NYC where students can choose from 700+ high schools), a natural hypothesis to investigate is that it is costly for applicants to process information, learn about, and precisely assess their preferences for all existing alternatives. If this is the case, allowing students to downsize their choice set, by revealing which programs are full by the time they get to apply, may be an additional benefit of the sequential design. To evaluate the magnitude of this additional benefit using Tunisian data, recent models of rational inattention and limited information in the context of discrete choice problems with large choice sets (e.g. Goeree, 2008; Manzini and Mariotti, 2014; Matjeka and McKay, 2015) may provide useful frameworks.
School choice and students’ outcomes

In the paper “Do selective high schools improve students’ outcomes? Evidence from Tunisia” (joint with Meryam Zaiem), we exploit in a sharp regression discontinuity (RD) design the admission cutoffs generated by the mechanism used to admit students into elite schools. From the policy perspective, this paper expands the already existing literature on reduced-form effects of selective schools by considering post-secondary outcomes on a nationwide scope. While most of the literature has focused on outcomes measured no later than the end of high school, by linking high-school application data with the above-mentioned data on the Tunisian post-secondary assignment procedure, we are able to document the effect of admission to an elite high school on the field, location, and selectivity level of the programs students apply and get assigned to.

From the methodological perspective, this paper shows that, despite the validity of the RD design, average and quantile treatment effects are not immune to biases resulting from sample selection and missing outcome data. We propose and estimate bounds for the true effects. We find that admission to an elite high school increases student performance at the end of high school. In addition, it increases the selectivity level of post-secondary programs students in the higher end of the distribution get assigned to. These conclusions differ significantly from those that would be drawn from naive RD estimates, hence highlighting the composition effects that need to be accounted for. Naive RD estimates show no significant difference between observed marginally treated and untreated girls’ test scores and post-secondary application choices. However, they show that treated girls have a larger exam-taking rate than untreated girls. Our bounds account for the change in the composition of control and treatment groups following the treatment-induced increase in girls’ probability to take the end-of-high-school exam. Correcting for the induced selection shows that treatment does have a significant and positive effect on exam scores for girls who would take the exam regardless of their treatment status (‘always-exam-takers’). Naive estimates being downward-biased is consistent with the intuition that students taking the exam only under treatment might be academically weaker than always-exam-takers, and would therefore perform worse than them when taking the end-of-high-school exam. This paper has been submitted for publication in April 2017, and is now under review.

The heterogeneity of the effects we find as well as the variety of results in the literature call for a better understanding of the mechanisms at play behind the effects of admission to an elite high school on students’ outcomes. In a companion working paper, ‘Educational inputs and timing: how do elite schools affect students’ outcomes?’ (joint with Meryam Zaiem), we investigate two types of mechanisms: the change in educational inputs induced by admission to an elite school, and the timing of the intervention. To explore the first mechanism, we link the students database to data on schools infrastructures and teachers. Allowing effects of admission to an elite high school to vary across the twelve Tunisian elite institutions, we evaluate the link between the magnitude of the treatment effects on students’ outcomes, and the intensity with which treatment modifies various dimensions of the school environment. Results suggest that, although average teachers’ quality and student monitoring are increased by admission to an elite high school, the higher peer achievement seems to be the main mediator of treatment effects on students’ outcomes. To assess the role of the timing of the intervention on the effectiveness of selective schools, we exploit a unique and recent feature of the Tunisian school
system. Elite middle schools were created in 2007 by the Ministry of Education in Tunisia, using a similar prototype and selection process as for elite high schools. Data on the first cohort to enroll in these collèges pilotes, graduating high school and applying to college in 2014, allow us to compare the effects on students’ outcomes of admission to an elite middle school, to an elite high school, or possibly to both, one after the other. Preliminary results suggest that, in the Tunisian setting, the intervention had larger effects on students’ outcome when performed at the high school level.

In the paper “Do selective high schools improve students’ outcomes? Evidence from Tunisia”, we identify two treatment effects of admission to an elite high school: (1) it increases students’ performance at the end-of-high-school exam, and (2) it increases the selectivity of the college programs they apply to. On the one hand, given the centralized mechanism used in Tunisia to assign high school graduates to university programs, higher scores at the end-of-high-school exam increase one’s admissibility chances to selective post-secondary programs. Hence, the latter treatment effect of admission to an elite high school may be a consequence of the former. On the other hand, the change in educational environment and peers induced by admission to an elite school may more broadly have a direct and independent effect on students’ aspirations, perceptions and preferences for post-secondary education. In future work, I would be interested in disentangling the extent to which the change in post-secondary application decisions is a consequence of the change in the competitiveness of students’ profile for selective programs, from the extent to which is it is due to a change in students’ preferences for selective post-secondary institutions. The fact that I identify and estimate students’ preferences for post-secondary programs in my job market paper can help for identification in this project.