I am a third-year PhD student in the Department of Economics at MIT. My main research interests are in applied behavioral economics, studying potentially biased decision-making in a variety of settings. I am particularly interested in consequential decisions made towards the start of the career, such as choice of undergraduate major and university or occupational choice, and the role that behavioral forces including biased beliefs and social norms play in shaping these decisions.

The development of mathematical talent among young people is an area where these forces are likely to have particularly powerful effects. The extensive literature in psychology and economics on 'stereotype threat' in mathematics suggests that certain groups, particularly women, might be inhibited from achieving their full mathematical potential by stereotypes and social norms around mathematical activities, and biases in beliefs about their ability that might be related to these stereotypes. More broadly, the phenomenon of 'math anxiety' discussed in the educational psychology literature is likely to act as a psychological impediment to some people who might have strong mathematical potential. I thus think that, beyond the specific proposal described below, there is room for further rich work in behavioral economics on this topic.

My primary current research project is highly complementary to the proposal described below. In my current project, which is joint with Nagisa Tadjfar, we use administrative data from the centralised university admissions service in the UK to study the determinants of students' university application portfolios, and the implications of these choices for their final match. In our initial results, we have found that women and students from low-income neighbourhoods tend to attend worse-ranked universities than comparable students from different demographic groups with the same high-school grades. and that this 'undermatching' for women is driven almost entirely by their less ambitious application choices. Going forward, we plan to use a combination of structural modelling and survey experiments, along with further reduced-form analyses in the administrative data, to understand more precisely what factors affect students' application choices. This setting and rich data provides opportunities to study several related questions, including drivers of the decision to opt in to study mathematics at high school and university level, as described in my proposal below.

A more early-stage project of mine focuses on the role of social status and social preferences in occupational choice. Occupations with similar salaries and educational requirements may differ substantially in the extent to which they are seen as prosocial or high-status careers; I hope to study the implications of this variation for labour supply, the allocation of talent, and equilibrium wages, using text analysis to quantify cultural perceptions of different occupations including their social status. This question also has applications to developing mathematical talent, as math-intensive careers vary in social status across contexts, and this variation may affect the selection into career paths that make use of mathematical talent. In another project, with Larry Schmidt, Taha Choukhmane and Cormac O'Dea, I am studying how matching incentives in 401(k) plans affect retirement savings decisions using Census-IRS linked data, comparing the effects to those of auto-enrollment, and the implications of these incentives for wealth inequality.

Prior to starting my PhD, I read Economics at the University of Cambridge, and then worked as a predoctoral research assistant for John Beshears, James Choi, David Laibson and Brigitte Madrian, focusing on behavioral economics and household finance. I have worked as a TA for undergraduate public finance and graduate behavioral economics at MIT.

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Education

Massachusetts Institute of Technology **Cambridge, MA**
PhD, Economics *2020 – Present*

Trinity College, Cambridge **Cambridge, UK**
BA (Hons), Economics, double first *2015—2018*

Employment and research experience

Massachusetts Institute of Technology **Cambridge, MA**
Teaching Assistantships *2022–2023*
14.41 (undergraduate public economics), 14.160 (graduate behavioral economics)

Massachusetts Institute of Technology **Cambridge, MA**
Graduate Research Assistantships *2020–2023*
Working for: Frank Schilbach (January–September 2021), Daron Acemoglu (June–August 2021), Larry Schmidt and Taha Choukhmane (January 2023–Present)

Harvard University / National Bureau of Economic Research **Cambridge, MA**
Predoctoral Research Assistantship *July 2018—July 2020*
Working for John Beshears, James Choi, David Laibson and Brigitte Madrian.

Trinity College, Cambridge **Cambridge, UK**
Undergraduate Research Assistantship *September 2017*
Working for Hamish Low.

Academic awards

MIT Department of Economics
Carl (1976) Shapiro Fellowship *2020—2022*

Trinity College, Cambridge
Senior Scholarship *2017*

Publications

'The rise and rise of women's employment in the UK'
IFS Briefing Note 234, with Barra Roantree *2018*

Work in progress

'The role of confidence and information in university application decisions'
With Nagisa Tadjfar *2023*

My research proposal, based on joint work with Nagisa Tadjfar, focuses on understanding barriers to studying mathematics along the educational pipeline in the UK, and the specific points at which students with high levels of potential in mathematics may be discouraged from pursuing mathematical subjects.

We plan to use a range of different methodologies to study how mathematical talent among students in the UK can best be identified and supported. First, we will conduct a primarily descriptive analysis of administrative data on the universe of undergraduate applicants to British universities from UCAS, the centralised university admissions service in the UK; we are currently using this dataset for a complementary project studying determinants of students' application choices more broadly. This dataset gives us information on maths grades in standardised exams at age 16 (GCSEs), when studying maths is compulsory, as a baseline measure of potential. It then allows us to see which students continue to study maths in optional standardised exams at age 18 (A-Levels), their teacher-predicted and actual grades in their A-Levels, whether they choose to apply to major in maths at university, and the quality of the universities that they apply to. We aim to understand how gender, ethnicity, neighbourhood income, type of school (private vs. state), and students' predicted grades affect high ability students' chances of continuing to study mathematics at a good university, and also crucially at what point in the pipeline different demographic groups may be discouraged from continuing their study of mathematics – whether it seems that these groups are predominately already discouraged at the point where they choose their A-Levels, or whether discouragement typically happens at the stage when students are applying to university.

Second, we will study the particular role of teacher-predicted grades in access to mathematics at university. In the UK, students apply to university on the basis of predicted rather than actual A-Level grades. In our complementary project, we have found preliminary evidence that female students receive lower predicted grades in their Maths A-Levels than similar male students who go on to achieve the same actual grade. We plan to study the implications of this and other potential biases in predictions for Maths A-Levels by analysing a natural experiment where, in England, the government removed an intermediate qualification for A-Levels that provided more objective information about students' A-Level performance before they applied to university – thereby increasing the importance of predicted grades in students' and universities' decisions – while in Wales and Northern Ireland the intermediate qualification was retained. The difference-in-difference in progression of different groups to university mathematics courses will provide quasi-experimental evidence on the role of predicted grades and teacher bias in encouraging or inhibiting high-ability students' progression. This analysis will also be conducted using the administrative data from UCAS.

Finally, we are in talks with some educational nonprofits, including the Women in Science and Engineering (WISE) Campaign and Causeway Education, to work directly with students in a small number of secondary schools. This would allow us to survey students around the time they are applying to university to elicit more detailed information about beliefs and preferences, which would enable us to give us further insight into the barriers to high-ability students applying to mathematical courses. As part of this, we are also interested in a randomised information intervention, where we aim to test both what information can encourage participation in mathematical courses, and what sources of information are most trusted by students when making their application choices; this would inform the design of future interventions to support mathematically talented school students in navigating their potential.