Research Statement

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My main research focus is in applied microeconomics, with an emphasis on issues in education, labor and public economics. I use quasi-experimental research methods to provide insight into policy issues related to the education and labor market. Starting with my PhD years at Texas A&M University, which I completed in four years (2011-2015) and continuing into my years as an assistant professor at the American University of Beirut (2015-2021) and Simon Fraser University (2021-present), I have taken a particular interest in understanding how educational choices and social environment can mold one's future. This has shaped my research agenda and resulted in a focus on the field of economics of education.

Specifically, in my research, I explore the extent to which policies inducing students into more education can be effective, as well as how college quality can impact labor market outcomes. I also study the mechanisms under which education quality and student tracking may matter in the human capital formation process. My research has also focused on looking at the determinants of the STEM gender gap in education with a specific focus on what can be done to narrow this gap. Finally, I also have a body of work exploring how role models and peers affect high school and college students' success. My research has been supported by several grants, including a SSHRC Insight Development Grant and an Upjohn Institute Early Career Research Award. My work has been disseminated to broader audiences through outlets such as Marginal Revolution and the Brookings Institution. Several papers of mine have appeared in multiple chapters of the Official Handbook of the Economics of Education (as well as two other handbooks). My work has also been cited in academic textbooks and U.S. Congressional testimonies. I will now summarize my past and current research contributions in more detail while also shedding light on future work.

The Returns to Education Quality

In my earliest work, my research focuses on how education quality affects student performance as well as labor market outcomes. Indeed, all three chapters of my PhD dissertation–which have all subsequently been published–include studies related to this issue. Early work on the returns to education literature had traditionally focused on quantity of education (Card 1999). This focus shifted towards understanding the returns to quality of higher education (Dale & Krueger, 2002; Hoekstra 2009). This literature mainly estimates the labor market returns to selective post-secondary institutions and for higher-skilled students. However, it is unclear whether students who are at the lower end of the skill distribution can benefit from an increase in access to higher quality 4-year universities. In *"Returns to Education Quality for Low-Skilled Students: Evidence from a Discontinuity"* (**Journal of Labor Economics**, 2018, with Serena Canaan,), we fill this gap in the literature by estimating the causal labor market returns to university quality and major choice for less selective institutions and lower skilled student populations. To do so, we use a regression discontinuity design that compares students who barely pass and barely fail the French national high school exit exam from the first attempt. We find that marginally passing is associated with a significant increase in the likelihood of attending a higher quality institution and enrolling in a STEM major. We show that this leads to a 12.5 percent earnings premium in the labor market. These findings add to our understanding of the returns to different degree types as well as universities. Notably, one of the

novel aspects of our study is that it documents substantial returns to university quality as well as STEM majors for low-skilled students—a population often overlooked in the literature—using an entire national university system.

Related, a literature focusing on the academic returns to high school quality or selectivity also arose and has documented mixed findings (e.g., Jackson, 2010; Pop-Eleches & Urquiola, 2013; Abdulkadiroglu, Angrist & Pathak, 2014). In my work, I attempt to reconcile these seemingly contradictory findings. In, *"Peer Quality and the Academic Benefits to Attending Better Schools"* (**Journal of Labor Economics**, 2018, with Mark Hoekstra and Yaojing Wang), we show that attending better quality high schools leads to improved test scores and increased access to universities in China. In particular, we find that students who score just above the Chinese high school entrance exam cutoff for elite high school eligibility experience large and significant gains in academic performance. We show that these effects do not extend to settings in which students gain access to marginally better high schools. Notably, an important contribution of our study is that we are able to show that the mechanism through which these effects operate are not due to improved peer quality or smaller class size; rather much of these effects seem to be explained by access to better teachers. This finding on the importance of having access to better teachers helps reconcile the seemingly contradictory and mixed findings reported in the literature on school quality and academic outcomes.

In, *"Conscription and the Returns to Education: Evidence from a Regression Discontinuity"* (**Scandinavian Journal of Economics**, 2020), I explore the mechanisms into which additional education leads to better labor market outcomes. To do so, I leverage the quasi-random nature of military conscription assignment in France which was based on date of birth. Consistent with the seminal work of Card & Lemieux (2001), I show that conscription avoidance led to increased educational attainment in France. However, this did not translate into increased earnings for those affected in our context. This presents a puzzle. Through a simple model of human capital accumulation, I analyze several competing hypotheses as to why conscription would increase years of education but not earnings. I find evidence suggesting that the returns to education induced by this policy were zero. This has serious implications as it suggests that policies geared at increasing the educational attainment of students without targeting the necessary complements and prerequisites of education may prove ineffective.

My early work on the returns to university and high school quality have given me some insights into fundamental issues in the economics of education literature that we still do not have convincing answers to. One such gap in the literature is that there is scant evidence on the longer-run returns to high-ability or gifted high school classrooms. Despite the prevalence of within school tracking programs worldwide, the empirical evidence on their impacts has mostly focused on early gifted education programs and/or has looked at shorter-term educational outcomes (e.g., Bui Craig & Imberman, 2014). In *"The Long-Run Education Benefits of High-Achieving Classrooms"* (**Forthcoming, Journal of Policy Analysis & Management**, coauthored with Serena Canaan and Peng Zhang), we further our understanding of these widely implemented ability tracking programs by looking at how tracking within high school affects students' college outcomes and performance in China. We find that high-achieving classrooms raise enrollment in elite universities by roughly 40 percent, as they substantially increase scores on the national college entrance exam—the sole determinant of university admission in China. Our finding that students substantially benefit from high achieving classrooms has important implications for current policy debates on the costs and benefits of school

tracking programs worldwide.

Related to my previous and current work on the causal link between education quality and labor market outcomes, Serena Canaan, Stefanie Fischer and I have started work looking at the labor market effects of attending a four-year versus two-year college. Using data from Santa Barbara Community college (SBCC), we leverage a unique program (Transfer Admission Guarantee: TAG) that gives students scoring above a certain GPA threshold the ability to automatically transfer from a 2-year to a 4-year public university in the state of California. Our goal with this project is two-fold. First, we intend to look at the labor market returns to a four-year versus two-year degree by exploiting the TAG transfer eligibility cutoff score. This adds to the recent literature looking at the returns to 4 vs. 2-year colleges (Zimmerman 2014; Goodman, Hurwitz & Smith, 2017). To do so, we are currently in the process of linking administrative student level data files from SBCC to the state of California tax records. Second, conversations with SBCC administrators suggests that many students do not know about this program—despite meeting the GPA transfer eligibility criteria. As a result, in the second part of the paper we plan to run a randomized information intervention to see if low-cost, and potentially scalable, informational nudges can increase participation in the TAG program.

Peer Environment and Human Capital Shocks

Another focus of mine within the economics of education literature involves the analysis of peer effects and social environment. An active literature has shown that girls and boys in school benefit academically from an increase in the number of female peers in a classroom starting with the seminal work of Hoxby (2000). In conjunction, findings from this literature generally find that women are less affected by the ability of their peers as compared to boys. In my work, I dig deeper into this black box and show that women can greatly benefit from high ability peers, conditional on them being of the same gender. In, *"High-Performing Peers and Female STEM Choices in School"*(**Journal of Labor Economics**, 2020, coauthored with Yaojing Wang,), we show how peer environment can affect women's STEM choices as early as high school in China. Indeed, despite the documented importance of field choice on later lifetime outcomes, we still do not understand all the factors related to such decisions, especially as it relates to gender disparities. In our paper, we find that exposure to top-performing female peers in mathematics increases the likelihood that women choose a science track in high school, while exposure to more high-performing male students decreases the share of women in STEM. This highlights a new finding in the peer effects literature; the direction and magnitude to which peer ability may affect female students is highly dependent on the gender of those peers.

The education peer effects literature has predominantly focused on analyzing how fixed peer characteristics (such as race or gender) impact student outcomes or how peer quality affects performance and labor market outcomes (Sacerdote, 2014). However, less is known about the transmission of other important peer characteristics, mainly those related to ideology and religious background. In, *"The Impact of Religious Diversity on Students' Academic and Behavioral Outcomes"* (**Revise & Resubmit, Journal of Labor Economics**, coauthored with Serena Canaan and Antoine Deeb), we provide the first causal evidence on how exposure to university peers from different religious backgrounds affects students' learning outcomes and behavior. To do so, we use administrative data from the American University of Beirut (AUB), a secular 4-year university in Lebanon, where students are randomly assigned to different peer groups. Prior to enrolling in AUB, students attend either

secular, Christian or Islamic high schools. These schools differ in whether they provide religious education and the religious diversity of their student body. We show that for students from Islamic schools, exposure to dissimilar peers improves their academic performance and makes them more likely to take classes with opposite religion teachers. In contrast, exposure to dissimilar peers decreases academic performance for students coming from secular schools, and has no impact on their instructor choice. Our results indicate that for individuals coming from religiously homogeneous backgrounds, intergroup contact weakens in-group bias.

The above paper inspired us to dig deeper into the black box of religious intergroup contact. In ongoing work, *"Intergroup Contact and National Integration in a Divided Society"* (coauthored with Ali Abboud, Samuel Bazzi, Serena Canaan and Antoine Deeb), we aim to uncover the mechanisms behind religious contact by understanding "how" religious diversity impacts people's views, ideologies and tolerance towards other religions in the long run and to also understand "why" such views could be malleable. Our project offers two broad contributions to the literature. First, this is the first attempt to look at the long-run impacts of intergroup contact in any setting. Second, we aim to understand the mechanisms behind these effects in a naturally occurring university campus setting which reflects real world conditions. This differs from previous work looking at intergroup contact in lab or field experimental settings (e.g., Mousa, 2020). This project requires the design and rollout of a large-scale survey experiment to all alumni at the American University of Beirut over the past 20 years. We target this population as we already possess data on their peer group formation. I successfully received funding from a Social Science and Humanities Research Council (SSHRC) insight development grant to support the costs associated with this survey ($67,371). The project has recently been approved by the institutional review board (IRB) at the American University of Beirut and we are currently in the stage of rolling out the survey to subjects (Summer 2024).

I also have a growing interest in understanding the relationship between early lifetime shocks and the human capital formation process. This led me to pursue a project on how the 2015 Lebanese garbage crisis impacted infant outcomes. This paper, *"The Adverse Effects of Open Air Waste Burning on Infants' Birth Outcomes"* (**Forthcoming, Journal of Human Resources**, coauthored (first author) with Ruba Ajeeb and Mark Hoekstra), looks at how open-air waste burning affects birth outcomes. This is important as an estimated 40 percent of the world's garbage is burned in open-air fires, which are responsible for as much as half of the global emissions of some pollutants. However, there is little evidence on the health consequences of open-air waste burning. To identify effects, we exploit variation in exposure across cities within Lebanon before and after the crisis using a difference-in-difference framework. Our results indicate that exposure had large impacts on birth outcomes; in-utero exposure to at least one open air waste burn increased premature births by 4 percentage points and low birth weight by approximately 7 percentage points. Given previous research by Black, Devereux, and Salvanes (2007) who document a clear causal link between birth weight and later lifetime outcomes, our findings suggest that open-air waste burning imposes significant costs on populations worldwide.

My interest in understanding the effects of human capital shocks also led me to investigate the question of how university policies can differentially impact students' short- and -long term success. This is important in light of evidence on the large and growing socioeconomic gap in postsecondary attainment (Bailey & Dynarski, 2011). In *"The Role of University Policies in Exacerbating Socioeconomic Inequality"* (**Working paper**, 2024, coauthored with Serena Canaan, Stefanie Fischer

and Geoff Schnorr), we look at the causal effect of academic probation on students' graduation and labor market outcomes. Academic probation is a widely used tool that is implemented in nearly all North American universities and in many other universities worldwide. Broadly defined, academic probation involves notifying low-performing students that they need to improve their GPA or will be dismissed from university. Despite its popularity as a tool, the long-run effects of academic probation are still poorly understood; particularly its impacts on low-income and first-generation students. To estimate causal effects, we use a regression discontinuity design that leverages as-good-as-random variation in the likelihood that students are placed on academic probation using rich administrative data for all first-year students entering a large public university in the state of California from 2007 to 2009. Importantly, our results reveal a novel and unintended consequence of academic probation; this policy increases university dropout for low-income students but has no effect on similar ability high-income students. This leads to large disparities in long-run wages for both groups at the ages 28 to 33. The main contribution of this paper is to show that this widely used and popular tool, implemented in most universities worldwide, may be contributing to the widening of socioeconomic inequality.

Role Models in Education

I am also currently involved in numerous completed and ongoing projects related to the role of university advisors and role models in education. Indeed, while many studies have documented the importance of teachers in the education production function (e.g Chetty, Friedman & Rockoff, 2014; Jackson, 2018), less is known about the significance of university advisors. In recently published work, *"Adviser Value-Added and Student Outcomes: Evidence from Randomly Assigned College Advisers"* (**American Economic Journal: Economic Policy**, 2022, coauthored with Serena Canaan and Antoine Deeb), we investigate the extent to which academic advisor quality affects students' college outcomes. Particularly, previous research has highlighted the importance of access to academic mentoring or coaching for students, but there is little to no evidence on whether advisor quality matters. Using rich administrative student data and a randomized student-advisor setting, we estimate advisor value-added (VA) and study its impacts on students' performance and college trajectories. We find that higher advisor VA substantially increases freshman year GPA and four-year graduation rates. We further document that effective advisors significantly increase high-ability students' likelihood of enrolling and graduating with a STEM degree. Our results indicate that allocating resources towards improving the quality of academic advising may play a key role in promoting college success.

In other recently published work, *"The Impact of Advisor Gender on Female Students' STEM enrollment and Persistence"* (**Journal of Human Resources**, 2023 with Serena Canaan), we look at how female role models affect the STEM gender gap in education. An often-discussed solution to the STEM gender gap is to provide women with close mentoring by female scientists, yet there is little causal evidence to support this. The strongest evidence we have on gender homophily comes from in-classroom teacher-student interactions (Carrell, Page & West 2010), but less is understood about this phenomenon outside of the classroom and in settings in which interactions are one-on-one and individualized. To understand if there is a causal link between the gender of a role model and that of a student, we exploit the unique freshman academic advising system at the American University of Beirut, where undergraduate students are randomly assigned to academic advisors. We find that women who are matched to a female rather than a male science advisor are substantially more likely

to enroll in and graduate with a STEM degree. These effects are entirely driven by high ability female students. We further show that the gender of an advisor from a non-science department has no impact on students' major choice. Our results indicate that providing close mentoring or advising by women scientists can play an important role in promoting women's participation and persistence in STEM fields.

We also have a related paper that discusses the above issue in the context of economics. In *"Does Advisor Gender Affect Women's Persistence in Economics"* (**AEA Papers and Proceedings**, 2021 with Serena Canaan), we show that the gender of an academic advisor is an important determinant of women undergraduates' persistence in economics. We find that having a female rather than a male advisor reduces female students' first-year dropout rates and increases their likelihood of graduating with an economics degree. Notably, findings from this study were used as evidence to support the establishment of a fund by the American Economic Association's Committee on the Status of Women in the Economic Profession (CSWEP) and the Social Science Research Council (SSRC) for the evaluation of cost-effective and scalable interventions designed to increase the presence and success of women throughout the economics and mathematics disciplines.

The above three studies focus on documenting the importance of college advisors in the education production function for both female students as well as the overall student. However, there still remains gaps in our understanding of whether college coaching programs specifically targeted at marginal students—who are most at risk of dropping out of university—can be effective. Previous work has indicated that intensive high-touch coaching programs can be quite effective, while low-touch non-personal programs are not as successful (Carrell & Sacerdote, 2017, Oreopoulous & Petronijevic, 2019). In, *"Keep Me In, Coach: The Short- and-Long Run Effects of a University Coaching Intervention"* (**R&R Journal of Political Economics Microeconomics**, coauthored with Serena Canaan, Stefanie Fischer and Geoff Schnorr), we ask whether a coaching program, aimed at improving self-confidence, is effective at boosting the performance of college students who receive negative information about their abilities. To establish a causal link between coaching and students' future outcomes, we leverage a unique aspect of the mentoring program at Cal Poly State University, San Luis Obispo, which effectively randomizes students into mentoring groups based on first quarter GPA. This enables us to investigate whether mentoring impacts marginal students' attrition, graduation and labor market outcomes. Notably, we are one of the first studies to be able to speak to whether coaching or mentoring programs affect students' labor market outcomes. Using a difference-in-discontinuity design, we show that the program raises participants' freshman-year GPA by 10.7 percent of a standard deviation, and decreases their first-year dropout rate by 8.7 percentage points. Effects are concentrated among low-income students who also experience a significant increase in six-year graduation rates and income at the ages of 25 to 28. Our findings indicate that targeting non-cognitive skills via a short-term, low-touch in-person coaching program can be an effective and inexpensive way to increase academically-struggling students' college retention and long-run success.

In line with our previous work on advisors and mentors, Serena Canaan and I have recently hand collected data on all advisors' religions at the American University of Beirut. We intend to combine this new data with our existing data on student religion in order to look at how advisor-student religion match affects students' academic outcomes and instructor choice. Importantly, while we have evidence from the literature on how gender or race homophily impacts students' outcomes, there is

virtually no evidence on how a non-fixed characteristic, such as religion, impacts the transmission of role model effects. The data for this project has been finalized and we are currently underway with our preliminary analysis.

Additional Topics

I have additional works in progress that deviate slightly from my traditional body of work. The first project was inspired by my recent and ongoing work on religious diversity; which has led me to think deeper about more general topics in political economy. In particular, I have a growing fascination in understanding how economic sanctions affect the sentiment of individuals in sanctioned countries. While previous papers have looked at how economic sanctions affect countries' economies, few papers have focused on the causal link between sanctions and the sentiment of individuals within these sanctioned nations. Political theory proposes two possible reactions: The first possibility is a "rally around the flag effect" that would increase sympathy and support for the sanctioned countries' government. The second is a deterioration of views towards the current leadership or government of a sanctioned nation. In line with this, Samuel Bazzi, Kiarash Hosseini and I are currently working on understanding which of these two reactions dominate. We use the country of Iran for our analysis as it is the most heavily sanctioned country in the world over the past 30 years. To estimate effects, we use a shift-share design that leverages variation in sanction exposure across cities through their reliance on import heavy manufacturing firms. This has required us to build a novel and large-scale data set linking trade activity to regional firms in Iran. Preliminary analysis suggests that sanctions decrease support for incumbent governments. However, this does not lead to meaningful change in leadership because it is also accompanied by large reductions in voter turnout.

Finally, I am also currently working on a project with Mark Hoekstra and Suhyeon Oh that empirically examines the extent to which networks matter in the allocation of publications in the often dubbed "top-5" journals in economics. In particular, some economists believe that the Journal of Political Economy and the Quarterly Journal of Economics may provide some sort of home bias to researchers at their "home" institutions. We use recent tools and techniques from the p-hacking identification literature in economics to empirically test if there are excess "marginally significant" estimates to be detected. To dig deeper into mechanisms, we also conduct power calculations on all main estimates to asses "quality". Finally, we use citation counts from google scholar and Web of Science to also look at any qualitative differences in articles published. We compare these patterns to estimates from papers published in top-5 journals in which no home bias is apparent. This has required hand scraping estimates from all main findings in the top-5 journals over a four-year period. We have recently finished scraping this large dataset and will begin analysis in the summer of 2024.

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