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15 September 2026

Emily Breza, Arun G. Chandrasekhar and Davide Viviano
Organizers, NBER Workshop on Development Economics and Networks for Early-Career Researchers

Dear Professors Breza, Chandrasekhar and Viviano,

I am writing to apply to the NBER Workshop on Development Economics and Networks for Early-Career Researchers on 5 December 2026. I am a fifth-year PhD student in economics at the University of California, Santa Barbara (degree expected 2028), currently writing my dissertation on how families and communities shape the choices of girls and women.

The paper I would present is "Improving Women's Participation in STEM in Tajikistan: A Role-Model Intervention," joint with Tasmia Rahman and Juni Singh of the World Bank. It reports a section-level randomized experiment in which role-model videos were shown in classrooms, or shown in classrooms and also sent to parents through a class WhatsApp group. The submission is an extended abstract with the key results tables, as the call allows; the full draft is in preparation. I lead the empirical analysis, and developing the study's spillover and network extension is part of my dissertation research.

The result that brings me to this workshop is the contrast between the two arms: the same videos produced no detectable change in the aspiration outcomes when shown in class, and lowered several of them when they were also sent to parents through the class WhatsApp group. Because every school holds treated and untreated sections, the design also raises an interference question that the experiment was not built to answer: whether exposure to parent-treated sections changed outcomes beyond the directly treated girls, and how a follow-up should measure and randomize network exposure. That is what I hope to learn to do.

This application contains, in order: this letter, my CV with PhD coursework, a one-page statement of motivation and research interests, and the extended abstract.

My recommender is Rachel Heath, University of Washington (mheath@uw.edu). She has agreed to be contacted.

Thank you for considering my application.

Sincerely,

Alexis (Lan) Wang

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Education

Ph.D. in Economics, University of California, Santa Barbara — Expected 2028

MACRM Program, University of Chicago Harris School of Public Policy, 2025 to 2026

PhD courses completed (UCSB): Microeconomic Theory I to III (Consumption and Production; Game Theory; Markets and Incentives); Macroeconomic Theory I to III; Econometrics I to III; Economic Development; Behavioral Development Economics; Field Experiments; Clustering and Multiple Comparisons; Causal Machine Learning; Population Economics; Labor Supply; Human Capital; Economics of Education; Public Economics I; Aggregate Economics; Continuous-Time Methods; Political Economy of Land; Demography

Audited: PhD Development Economics (Michael Kremer), University of Chicago, fall 2025

M.A. in Economics, University of California, Santa Barbara — 2023

B.Sc. in Accounting and Finance for International Business, Coventry University — 2020

Research Fields

Primary: Development Economics, Cultural Economics

Secondary: Migration, Political Economy

Relevant Experience

Summer Intern (eMBeD), World Bank — June to August 2026

Empirical Research Fellow (Predoctoral), Northwestern Kellogg School of Management — 2020 to 2022

Field: Political Economy and Economic Development. Mentor: Prof. Nancy Qian

Job Market Paper

Homeland Echoes: The Persistent Grip of Origin Identity on Immigrants (with Wenbei Zhang)

Funded by UCSB Feminist Futures

Examines whether and how the cultural and institutional environment of origin countries continues to shape immigrants' demographic behavior after migration. Using restricted access NCHS Vital Statistics records, we trace fertility responses among Chinese immigrants in the United States to family planning policy variation in China, including the One Child Policy and the subsequent Two Child reform. Difference in differences and event study designs identify how homeland policy shocks propagate to diaspora populations long after migration, with implications for the persistence of culture and the political reach of authoritarian regulation. [Working Paper]

Work in Progress

Improving Women's Participation in STEM in Tajikistan: A Role-Model Intervention (with Tasmia Rahman and Juni Singh, World Bank)

Data collection completed June 2026; extended abstract available

Section level randomized evaluation in Khatlon, Tajikistan, of whether relatable role models shift adolescent girls' education and career aspirations toward STEM. Grade 9 and 10 sections were assigned to a control group, to a classroom screening of videos featuring Tajik women in STEM careers, or to the same screening with the videos also sent to parents through a class WhatsApp group with tracked links. We measure girls' aspirations, beliefs about STEM careers and perceived gender norms at a two week endline. Implementation partner is Z-Analytics, with the World Bank's Mind, Behavior and Development unit; the trial is registered at the AEA RCT Registry (AEARCTR-0018998).

Shelter, Skills, and Cognition: Evaluating Integrated Strategies to Reduce Intimate Partner Violence in Rural Tanzania (with Rachel Heath, Ziyue Chen, and Zixu Chen)

Piloting; Funded by J-PAL Crime and Violence Initiative and Berkeley CEGA

Multi arm randomized evaluation in Kirumi, Mara Region, Tanzania, of integrated interventions to reduce intimate partner violence. Arms combine immediate versus delayed shelter access for IPV survivors with two add on components: an economic empowerment package and a CBT curriculum targeting abusive husbands. Implementation partner is the Empowerment and Health Promotion Organization (EHPO).

Local Gates, National Flows: Provincial Policy Variation and Non Hukou Migrant Welfare (with Yao Yang)

Constructs a province level panel index of welfare access for China's non hukou population covering all 31 provinces from 2013 to 2025. The index combines gaokao access for migrant children and urban housing purchase restrictions into a unified ordinal score, reported at both capital city and province wide levels and anchored throughout to primary government sources. We use the index to estimate how local policy heterogeneity shapes internal migration flows and welfare outcomes for non hukou residents.

Grants

J-PAL Crime and Violence Initiative Pilot Grant, $51,396 — 2026
Berkeley CEGA Development Economics Challenge Grant, $5,000 — 2025
UCSB Orfalea Center Research Stipend, $6,300 — 2024

Awards and Fellowships

Harris Merit Scholarship, University of Chicago ($42,000) — 2025 to 2026
Orfalea Center Fellowship, UCSB — 2024 to 2025
Graduate Student Fellow, Broom Center for Demography, UCSB — 2024 to 2025
International Academic Excellence Award, Coventry University — 2019

Presentations

2027

ASSA Annual Meeting, Poster Session (scheduled)

2026

CEPR Economics of Demographic Shocks in the Long Run (scheduled); All California Labor Economics Conference; Berkeley Center for Chinese Studies Social Sciences Graduate Conference (scheduled); All UC Demography

Teaching

University of Chicago Booth School of Business

Teaching Assistant, Negotiations (EMBA); Teaching Assistant, Choosing Leadership (Undergraduate)

University of California, Santa Barbara

Head Teaching Assistant, Intermediate Microeconomics (Undergraduate); Teaching Assistant, Introductory Econometrics (Undergraduate); Teaching Assistant, Development Economics (Undergraduate)

Pre Doctoral Research

The Political Economic Determinants of Nuclear Power: Evidence from Chernobyl — Dec 2020 to Jan 2025
Research Assistant to Prof. Shaoda Wang, Prof. Alexey Makarin, and Prof. Nancy Qian

Panem et Circenses: Autocrats and Sports — Jun 2021 to Aug 2022
Research Assistant to Prof. Edoardo Teso and Prof. Nancy Qian

Racial Discrimination and the Social Contract: US Army Enlistment during WWII — Aug 2020 to Aug 2022
Research Assistant to Prof. Marco Tabellini and Prof. Nancy Qian

Fair Wealth Annual Report, Fudan University — Apr 2019 to Jul 2019
Research Assistant to Ming Ji and Prof. Min Ding

Monthly Macroeconomic Risk Reports, China Development Bank — Mar 2018 to Jul 2018
Research Assistant to Cong Wang, Dr. Li Li, and Dr. Ning Cai

The Value of U.S. College Education in Global Labor Markets — Mar 2018 to Jun 2018
Research Assistant to Dr. Mingyu Chen

Industry Experience

Audit Winter Intern, PricewaterhouseCoopers (China) — Jan 2018 to Mar 2018

Professional Service and Volunteer

Board of Directors, Empowerment and Health Promotion Organization (EHPO), Tanzania — 2024 to present
Application Reviewer, CEGA Fellowship, UC Berkeley — 2025
Volunteer, Love and Care Foundation (Women Project), India — 2017

Statement of motivation and research interests

Alexis (Lan) Wang, University of California, Santa Barbara

I am a fifth-year doctoral student in economics at the University of California, Santa Barbara, with the degree expected in 2028. My dissertation asks how families, and the communities around them, shape the choices of girls and women. Its chapters are a paper on immigrant fertility and two field experiments, one of which is the paper I am submitting. I spent the last academic year at the University of Chicago's Harris School to deepen my training in development economics and field experiments, and audited Michael Kremer's PhD course in development economics there in the fall. This summer I worked with the World Bank's Mind, Behavior and Development unit on the Tajikistan experiment.

The question is the same in each chapter. My job market paper uses restricted birth records to trace how China's family planning policies reached Chinese immigrants in the United States, and finds that the homeland's policy kept shaping fertility long after migration. With Rachel Heath and two coauthors I am piloting a randomized evaluation in rural Tanzania of shelter access, economic support and a cognitive behavioral curriculum for husbands, to reduce intimate partner violence. The Tajikistan experiment, with Tasmia Rahman and Juni Singh, tests whether role-model videos, alone or reinforced through a parents' WhatsApp group, move adolescent girls toward STEM. The projects grew out of different settings, but they return to the same question: how families and the communities around them shape the choices girls and women make.

The Tajikistan result is the reason I am applying, and it is where the dissertation needs the most help. The classroom videos did nothing. Sending the same videos to parents through an existing network lowered the girls' aspirations. I can describe that contrast, but I cannot yet explain it, and the tools I need are the ones this workshop is about: how a message moves through a class, a family and a school; how to measure exposure when every school holds treated and untreated sections; and how to design the next round so that the network is part of the design rather than something I discover afterward. The Tanzania project raises the same questions from the other side: the intervention reaches wives and husbands in the same households, and how it travels through a village is something the design has to settle before it goes to the field.

From the workshop I hope to learn how to design and analyze a network experiment, to hear from people who have done it, and to get direct criticism of the spillover analysis I plan for the Tajikistan data. These tools would directly shape two dissertation chapters: the spillover extension of the Tajikistan experiment and the design of the Tanzania experiment before it goes to the field. I would bring one completed experiment with a puzzle in it, and a second one about to go to the field.

Improving Women's Participation in STEM in Tajikistan: A Role-Model Intervention*

Tasmia Rahman
World Bank

Juni Singh
World Bank

Alexis Wang
UC Santa Barbara

September 2026

Preliminary and confidential. Prepared for the organizers of the NBER workshop only; not for circulation or citation. Full draft in preparation.

Abstract

Few women in Tajikistan train for STEM fields: 82 percent of female students in higher professional education study education or economics (World Bank 2021), and female labor force participation, 21 percent in 2022, is the lowest in Europe and Central Asia in the latest comparable data (World Bank 2025, 2026).[1] Experimental evidence from the region is scarce. We assigned 204 grade 9 and 10 sections in Khatlon to a control group, to a 30-minute classroom screening of three videos featuring Tajik women in STEM careers (T1), or to the same screening plus the videos sent to parents through a class WhatsApp group with tracked links (T2). At an endline held within two weeks of the screenings, with sections classified by the arm actually delivered, the classroom videos alone produced no detectable change in any of the seven aspiration outcomes. Relative to control, the parent arm lowered several: among girls who would like to work, the share naming a STEM sector fell by 6.3 percentage points on a control base of 14.8 percent, and the shares aspiring to and expecting college or higher fell by about 8 points each. Career perceptions rose by 0.20 standard deviations under T1, with no comparable gain under T2. Because treatment was assigned across sections within schools, the design also raises the question of whether the message traveled beyond the directly treated sections after the videos were sent to parents in some sections.

1 Design and data

The study covers grade 9 and 10 girls in general-education schools in the Balkhi and Kushoniyon districts of Khatlon. Within each school and grade, sections were assigned

*Extended abstract prepared for the NBER Workshop on Development Economics and Networks for Early-Career Researchers, 5 December 2026. The trial is registered at the AEA RCT Registry, AEARCTR-0018998. The full draft is in preparation. Wang is the presenter: lan_wang@ucsb.edu.

[1] Labor force participation rate of women aged 15 and older, modeled ILO estimate, World Development Indicators series SL.TLF.CACT.FE.ZS, 2023: the lowest of the 48 economies in the World Bank's Europe and Central Asia region with a value that year. The 2025 assessment reports 21 percent for 2022.

by lottery to a control group, to a 30-minute classroom screening of three videos featuring Tajik women in STEM careers (T1), or to the same screening plus the videos sent to parents through a class WhatsApp group with tracked links (T2). The trial is registered at the AEA RCT Registry (AEARCTR-0018998). Field implementation departed from the lottery for some sections. The main tables classify sections by the arm actually delivered; 83 percent of girls sat in sections that received their lottery arm. The full draft reports estimates by the original lottery assignment and instrumental-variables estimates that use the lottery as an instrument for the arm delivered. Field work was carried out by Z-Analytics: baseline survey 7 to 16 May 2026, screenings around 19 to 21 May, endline interviews from 22 May to 1 June. The analysis sample is the panel of 1,513 girls interviewed in both waves (479 control, 551 T1, 483 T2) in 200 sections; 32 percent of baseline girls were not found at endline (34, 34 and 28 percent in control, T1 and T2, differences not statistically distinguishable from zero), and all main results are re-estimated with inverse-probability weights and bracketed with Lee bounds in the full draft. Estimates come from

$$Y_{ic} = \alpha + \beta_1 \, \mathrm{T1}_c + \beta_2 \, \mathrm{T2}_c + \gamma' X_i + \varepsilon_{ic}, \tag{1}$$

where Y_{ic} is the endline outcome of girl i in section c, $\mathrm{T1}_c$ and $\mathrm{T2}_c$ indicate the arm of section c, X_i contains age together with grade and district fixed effects, as pre-specified, and standard errors are clustered at the section level; the contrast of interest is $\beta_2 - \beta_1$, comparing the classroom-plus-parent arm with the classroom-only arm. Within a section the estimate ignores whether a girl attended the screening or her parents opened the links. Indices are means of z-scored items re-standardized against the control girls of the panel sample.

2 The network question

The parent arm is a test of pushing the same message through the parents of a section, reached by a WhatsApp group created for the study and layered on the classroom screening. Relative to the classroom arm, that layer lowered aspirations rather than reinforcing them; that contrast is the paper's central empirical result. Table 5 reports the two baseline relational measures the survey holds: the number of friends a girl works and spends time with in her study group, and whether she knows a woman in STEM. Each is interacted with treatment on the five pre-specified heterogeneity outcomes, pooled as the analysis plan specifies and then by arm. Pooled, no interaction reaches the 5 percent level. By arm, one of twenty does, against about one expected by chance, and three more sit between 5 and 10 percent; all four point to larger effects, positive or negative, among girls with higher values of these measures. We read this as suggestive only. Because the three arms were assigned within school-by-grade strata, control sections generally share a school and grade with sections whose parents were sent the videos. The experiment was not designed as a network experiment. The lottery assigned about equal numbers of sections to each arm within every school and grade, so the share of T2 sections around any control girl is roughly one third everywhere, which leaves little variation for estimating spillovers; and the baseline holds only the two relational items above. With the data in hand, we can examine whether girls report discussing STEM with friends in other sections, as a mechanism outcome rather than a moderator, and run an exploratory spillover check among control girls using that limited

variation in exposure to T2 sections. The survey contains no friendship name generator, so richer measures of network position cannot be constructed.

3 Key results

Table 1 reports the seven components of the registered aspirations index as separate binary outcomes, a disaggregation adopted after the endline data were examined; the registered index itself is reported in the full draft. None of the seven T1 coefficients is significant. The T2 coefficients are negative on all seven and significant on three: the share naming a STEM sector among girls who would like to work, and the shares aspiring to and expecting college or higher. Whether a girl wants to work at all does not respond significantly to either arm (T1 -1.7 points, T2 $+2.0$). Tables 2 to 4 report the belief indices; higher values denote more favorable attitudes and career perceptions, more gender-equitable perceived norms, and higher self-efficacy and growth mindset. Career perceptions rise by 0.20 standard deviations under T1 and do not move under T2; perceived gender norms rise under T1 only, at the 10 percent level; attitudes toward STEM, self-efficacy and growth mindset do not move in either arm. The contrast between the two treatment arms is negative on 13 of the 15 outcomes. The full draft adds family-wise and randomization inference, the lottery-assignment and instrumental-variables estimates, and the exploratory splits by parent discussion and by the relational measures. It also re-estimates Tables 1 to 4 with school-by-grade fixed effects for the randomization strata: every standard error falls, every significant coefficient keeps its sign, and no null result becomes significant at 5 percent.

Table 1: Educational and work aspirations

	Control mean	T1	T2	T2−T1	N
Intends the natural and technical track	19.6	−0.1	−2.9	−2.8	1,299
		(2.9)	(3.0)	(3.1)	
Could obtain a STEM degree, no barriers	61.6	−2.8	−1.7	+1.1	1,513
		(4.2)	(4.2)	(4.3)	
Expects to obtain a STEM degree	65.3	+2.7	−2.6	−5.3	1,513
		(3.9)	(4.1)	(3.6)	
Would like to work in a STEM sector (among girls who want to work)	14.8	−3.5	−6.3**	−2.9	1,371
		(2.6)	(2.7)	(2.4)	
Expects to work in a STEM sector (among girls who expect to work)	13.8	−0.8	−2.5	−1.7	1,209
		(3.2)	(3.2)	(3.1)	
Aspires to college or higher	42.1	−1.2	−8.3**	−7.1**	1,487
		(3.9)	(3.8)	(3.5)	
Expects college or higher	41.7	−1.8	−8.0**	−6.3*	1,473
		(3.9)	(4.0)	(3.7)	

Notes: Each row is a separate outcome. Columns report estimates from equation (1), with sections classified by the arm delivered: OLS of the endline outcome on treatment indicators, age, and grade and district fixed effects, estimated on the panel sample. T2−T1 is the difference between the two treatment coefficients. Standard errors, clustered at the section level, in parentheses. Effects are in percentage points; control means are endline shares in control sections. Sample sizes differ across rows: girls who answered do not know on whether they will continue after grade 11 are missing on the track outcome, girls who do not want (expect) to work skip the sector questions, and a sector named outside the coded list is set to missing on the work outcomes. * p<0.10, ** p<0.05, *** p<0.01.

Table 2: Perceived gender norms

	T1	T2	T2−T1	N
Gender norms index	+0.150*	−0.058	−0.207**	1,513
	(0.078)	(0.082)	(0.080)	
Own beliefs subindex	+0.089	−0.030	−0.119*	1,513
	(0.075)	(0.074)	(0.072)	
Perceived parental norms subindex	+0.142**	−0.063	−0.205***	1,513
	(0.070)	(0.075)	(0.074)	
Perceived prevalence subindex	+0.129	−0.057	−0.186*	1,468
	(0.106)	(0.116)	(0.108)	

Notes: Each row is a separate outcome. Columns report estimates from equation (1), with sections classified by the arm delivered: OLS of the endline outcome on treatment indicators, age, and grade and district fixed effects, estimated on the panel sample. T2−T1 is the difference between the two treatment coefficients. Standard errors, clustered at the section level, in parentheses. Effects are in standard deviations of the control distribution; each index is standardized on the control girls of the panel sample, so control means are zero by construction. The prevalence subindex has fewer observations because girls who answered do not know on both share items are missing. * p<0.10, ** p<0.05, *** p<0.01.

Table 3: Attitudes toward STEM and career perceptions

	T1	T2	T2−T1	N
Attitudes toward STEM index	+0.021	−0.028	−0.049	1,513
	(0.079)	(0.075)	(0.072)	
Career perceptions index	+0.197***	+0.031	−0.166**	1,513
	(0.074)	(0.075)	(0.079)	

Notes: Each row is a separate outcome. Columns report estimates from equation (1), with sections classified by the arm delivered: OLS of the endline outcome on treatment indicators, age, and grade and district fixed effects, estimated on the panel sample. T2−T1 is the difference between the two treatment coefficients. Standard errors, clustered at the section level, in parentheses. Effects are in standard deviations of the control distribution; each index is standardized on the control girls of the panel sample, so control means are zero by construction. * p<0.10, ** p<0.05, *** p<0.01.

Table 4: Self-efficacy and growth mindset

	T1	T2	T2−T1	N
General self-efficacy index	+0.097	−0.053	−0.150*	1,513
	(0.077)	(0.084)	(0.088)	
Growth mindset index	+0.002	+0.055	+0.053	1,513
	(0.072)	(0.074)	(0.072)	

Notes: Each row is a separate outcome. Columns report estimates from equation (1), with sections classified by the arm delivered: OLS of the endline outcome on treatment indicators, age, and grade and district fixed effects, estimated on the panel sample. T2−T1 is the difference between the two treatment coefficients. Standard errors, clustered at the section level, in parentheses. Effects are in standard deviations of the control distribution; each index is standardized on the control girls of the panel sample, so control means are zero by construction. * p<0.10, ** p<0.05, *** p<0.01.

Table 5: Treatment effects by baseline relational measures

	Treatment × moderator interaction		
Outcome	Pooled	T1	T2
Panel A. Friends in the study group above the within-grade median			
STEM choice (binary)	−6.9	−14.1**	+1.3
	(5.2)	(5.9)	(5.8)
Aspirations index	−0.138	−0.185	−0.082
	(0.105)	(0.124)	(0.109)
Attitudes toward STEM index	+0.150	+0.079	+0.229*
	(0.108)	(0.119)	(0.130)
Career perceptions index	+0.204*	+0.156	+0.261*
	(0.114)	(0.120)	(0.133)
General self-efficacy index	+0.059	+0.033	+0.092
	(0.110)	(0.126)	(0.120)
Panel B. Knows a woman in STEM			
STEM choice (binary)	−0.4	−3.0	+2.5
	(4.8)	(5.2)	(5.7)
Aspirations index	−0.119	−0.042	−0.208*
	(0.100)	(0.118)	(0.108)
Attitudes toward STEM index	+0.018	+0.084	−0.057
	(0.112)	(0.127)	(0.126)
Career perceptions index	+0.034	+0.065	−0.005
	(0.117)	(0.130)	(0.140)
General self-efficacy index	+0.043	+0.013	+0.074
	(0.092)	(0.109)	(0.111)

Notes: Each cell is the coefficient on the interaction of a treatment indicator with the moderator, from a separate regression on the panel sample that adds the moderator, its interaction with treatment, and the baseline value of the outcome to equation (1); standard errors, clustered at the section level, in parentheses. The two moderators are the relational measures the baseline module holds (it has no friendship name generator) and are among the eight moderators named in the pre-analysis plan; the plan specifies the pooled column, in which a single indicator for any treatment replaces the two arm indicators; the two arm columns are an exploratory split. STEM choice is the plan's binary indicator of a STEM track or STEM sector aspiration (item 4.1.1, 4.12 or 4.14), the outcome of the heterogeneity block. Binary outcome in percentage points, indices in standard deviations. Twenty arm interactions are reported, so about one is expected to reach the 5 percent level by chance. * p<0.10, ** p<0.05, *** p<0.01.

References

World Bank. 2021. *Tajikistan Country Gender Assessment.* Washington, DC: World Bank.

World Bank. 2025. *Tajikistan Poverty and Equity Assessment.* Washington, DC: World Bank.

World Bank. 2026. "World Development Indicators." https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS (accessed September 2026).