Institutions and Gender Culture

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IV. The interplay of two gender cultures

From Pink-Collar to Lab Coat: Cultural Persistence and Diffusion of Socialist Gender Norms

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The Russian Immigration Wave to Israel
A Natural Experiment

- The meeting of two gender culture
  - ✓ Israeli: typical OECD
  - ✓ Russian (Soviet)
- Within the span of 5 years, starting in 1989, over 800,000 immigrants arrived in Israel whose population at the time was around 4.5 million.
- Between 1989 to 2002, 1.37 million FSU Jews and their family members emigrated from the FSU, 67% of them to Israel. US= the second major destination: 21% of FSU emigrants, Germany: 3rd destination: 12%.

Track Legacy of the Soviet culture in two main dimensions

- Priority given to science and engineering // priority of the military-industrial sector
- Gender-equal culture of work
  - ✓ Institutions aimed at promoting full employment (and fertility) of both men and women, harnessed to the objective of rapid industrial growth
  - ✓ Full employment norm for women → work values → educational choices … and conception of gender roles (?).

Soviet Scientific Gender Culture

- Soviet strong scientific culture was shared by both men and women.
- ≠ other countries, such as France and Israel, where STEM fields are also notorious but almost exclusively masculine
  - ✓ For instance, out of the 59 laureates of the **Fields medal**, 11 were French (12 American, 7 British, and 9 Russian or Soviet) and 15 were affiliated to a French institution at the time of the award
  - ✓ https://stats.areppim.com/listes/list_fieldsxmedal.htm

Nuance: Women at work and in science in the USSR

- Official emphasis on gender equality in paid work and actual full-employment regime that applied to both men and women
- **But** women's careers remained impeded by stereotypes and discrimination,
- as well as by the burden of household chores
- → array of policy measures aimed at supporting women in their double role of workers and mothers.
- Although women were often concentrated at the lower rungs of the labor force, they nonetheless constituted over 40% of engineering and technical workers in the mechanical engineering and electrotechnical industries.
- Women massively entered scientific fields, although they were most often barred from reaching the highest positions.
- In **summary**, in USSR: while gender inequality was far from fully overcome, women's involvement in the labor market and science was substantially wider and deeper than among women in the West during the same time period.

Nuance: Jews in the USSR

- Another concern is the extent to which Jews in the USSR were influenced by the Soviet focus on sciences, given the overt discrimination they faced in tertiary education and on the labor market.
- In universities there were explicit or implicit quotas restricting the number of Jewish students and Jews were excluded from law schools, diplomatic and military academies.
- However, Jews in general, including in Russia and other USSR states, were traditionally characterized by investments in education and culture (Botticini and Eckstein, 2012), and given that "political" career paths were closed, many Jews turned to STEM and medical fields. Therefore, despite the restrictions, the Jewish population remained more educated than the average FSU citizen

Glance at the current Israeli labor market

- Among women in prime working age in 2016, FSU immigrants have the highest rate of labor force participation (93%), followed by natives (89%) and other immigrants (84%).
- Women from the FSU are also more likely to hold a full time job (40 hours per week) and to work long hours, compared to female natives and other immigrants respectively.
- They are also more likely to be in health, ICT and engineering occupations, whereas native women are more likely to be in teaching, social, and law occupations

Identification

- These patterns could also reflect the direct experience that FSU women had with Soviet institutions, prior to immigration.
- To avoid this confounding effect, we focus on a cohort of students born in 1988/9, before the fall of the Berlin wall, of which nearly 15% were born in the FSU and 4% were born in other countries.
- Within this cohort, immigrants, while born abroad, arrived in Israel as children, and as such face the same future labor market and are exposed to the same institutional setting as natives and other immigrants throughout the educational pipeline.
- little to no exposure to institutions in the FSU, entire formal schooling career in the Israeli school system.
  - ✓ among immigrants from former communist countries, only 1.4% were born in socialist Central European countries outside of the Soviet Union. → refer to the whole group as FSU immigrants.

Natural experiment

- Both the choice to migrate and the timing were largely driven by global geo-political events
  - ✓ Overall, 75% of the USSR Jewish population migrated following the fall of the Iron Curtain
  - ✓ selection into immigration based on ethnicity rather that human capital or other economically relevant characteristics
  - ✓ Default migration destination for FSU Jews = Israel,which absorbed 75% of them
- Addition of nearly 20% to the country's population --> substantial variations in the concentration of FSU immigrants across municipalities and schools in Israel
  - ✓ Use to gauge the exposure of native women to Soviet-style gender norms.

The Jewish emigration from the Former Soviet Union

- After WWII, no emigration from USSR
- These restrictions were loosened during the 1970's, as a counterpart of Soviet access to Western technology and trade with the West, and due to an international campaign to "rescue" Soviet Jews.
- Official pathway to emigration was through family reunification
- In the early 1970's, virtually all Jewish emigration went to Israel, but in the second half of the decade, the majority of Jewish emigres headed to the United States, which accepted them as asylum seekers.
- In total, between 1971-1980, about 291,000 Jews emigrated from the USSR.
- However, by the end of the decade, both the deterioration of the relationships with the West and internal crises progressively put an end to emigration.
- Collapse of the Soviet regime led to the removal of emigration restrictions in 1989 and coupled with the severe economic crisis, created the conditions for the massive exodus of Jews from the FSU.

The Russian Immigration Wave to Israel
A Natural Experiment

- Cohen *et al.* (2011) compare Jewish immigrants across these three destinations and find indications that there was **positive selection in terms of education of migrants to the US**, and no discernible differences among migrants to either Israel or Germany.
- => not much selection into migration and across destination countries, based on education and work opportunities
- => not a positive selection towards Israel, compared to the other possible destinations.

The Jewish emigration from the Former Soviet Union

- Among FSU immigrants in early 1992, 68% of men (76% of women) held academic and managerial positions before immigrating.
- By contrast, 69% of native Israelis worked in blue-collar occupations.
- Over half of FSU immigrants had more than 13 years of schooling, compared to 28% of natives.
- They exhibited the Soviet predilection for STEM:
  - ✓ the immigration wave added 60,000 engineers to an existing stock of about 27,000, and added 1,209 and 421 PhDs in physical sciences and mathematics and computer science, compared to 741 and 241 among natives, respectively.

Identification: Diff-in-Diff

- We track students' educational trajectories from achievement in eighth grade through tertiary education
  - ✓ In Israel, the choice of study field reflects occupational choices.
- We distinguish three groups of population:
  - ✓ **Natives**—enacting Western gender norms;
  - ✓ **FSU immigrants**—reflecting Soviet gender norms;
  - ✓ **Other immigrants**—representing a diversity of cultural backgrounds, but capturing the general effect of immigration on educational achievement and attainment.
- Compare the magnitude of gender gaps and occupational segregation across these groups
  - ✓ **using male students as the baseline** to account for unobserved characteristics of the three groups that drive choice patterns but are not gender specific.
  - ✓ **separate** the persistence of **general preferences** (of FSU students for STEM, by example) from **gender norms** regulating the choices made by women.

Hypotheses to test

- (1) Smaller gender segregation in education and occupations among FSU descendants
- (2) These smaller gender gaps are due to FSU women acting closer to traditional Western male choices rather than FSU men being closer to Native women
- (3) Smaller gender gaps reflect cultural preferences over occupations, rather than initial differences in skills or abilities
- (4) Increased exposure to the FSU gender equal culture affects the choice behavior of native females

Channels of cultural transmission

- Family (intergenerational transmission)
- Neighbourhood peer effects
  - ✓ Large size of the immigration wave
  - ✓ Influence of institutions (kindergardens, schools) and role-models (imitation of math-oriented girls

Preview of results: vertical transmission

- In tertiary education, FSU women
  - ✓ are over-represented in STEM, as well as in other fields, such as Economics, business and management, compared to women of the other groups
  - ✓ do not follow the general overwhelming female self-selection into study fields leading to "pink-collar" occupations, such as education and social work.
- → narrower gender gaps in the choice of STEM, as well as traditional female study fields, compared with both natives and other immigrants.
- not explained by differences in early STEM related skills or comparative advantage.
- Other immigrants: gender patterns similar to those of natives,
  - ✓ => the smaller gender gaps among FSU immigrants are not driven by the general effect of immigration as such.

Preview of results: horizontal diffusion

- Concentration of FSU immigrants in middle school (eighth grade) = proxy measure for the exposure of native students to Soviet gender norms.
  - ✓ capture both school level peer effects as well as neighborhood effects, two vectors of local diffusion of cultural norms
- The propensity of native-born young women to choose tertiary STEM study fields increases with the concentration of FSU immigrants in their lower-secondary school,
  - ✓ while young native men remain unaffected.
- Symmetrically, native women's propensity to choose Pink-collar study fields decreases as their exposure to FSU immigrants increases.

Estimation strategy

- Tertiary study field choice is our main outcome of interest reflecting, in Israel, ex-ante occupational choice.
- Tertiary programs in Israel are field specific, rather than general
  - ✓ a large share of bachelor degrees, such as nursing, engineering, and teaching are directed at occupational accreditation or preparation
- Strong relationship between occupational choice and field of study in Israel
  - ✓ Israeli students enter tertiary education at an older age, around age 24, and therefore more oriented towards the labor market

Vertical transmission estimation

$$y_i = \alpha + \beta_1 Female + \beta_2 Native + \beta_3 Other + \beta_4 Fem * Nat + \beta_5 Fem * Other \qquad (1)$$

- Difference-in-differences framework comparing gender gaps across three groups within a single labor market and education system.
  - ✓ "FSU immigrants", "Native born Israelis", and "Other immigrants"
- Coefficient β1: gender difference in outcomes within the FSU group
- β2 and β3: general differences of Natives and Other immigrants / FSU immigrants
- We expect β2 and β3 <0, when the outcome is the choice of STEM study fields
- If differences in gender gaps between FSU immigrants and natives, β4, is merely driven by the effects of immigration and not cultural norms, then β5 should be close to zero, i.e. gender gaps among immigrants are independent of cultural origin.
- If it is not: specific behavior of FSU women

Vertical transmission estimation

$$y^j_{ism} = \beta^j_0 + \beta^j_1 Female_i + \beta^j_2 Native_i + \beta^j_3 Other_i + \beta^j_4 Fem_i * Nat_i + \beta^j_5 Fem_i * Other_i + X'_i\gamma + S8'_{s-i}\gamma + \eta_m + Math8'_i\theta + u^j_{im} \quad (1)$$

Equation 1 estimates the extent of vertical transmission, where y^j_{ism} is a binary variable indicating whether individual i from middle school s in municipality m attended a tertiary program within study field j; $Female$ is a gender dummy, and FSU, $Native$, and $Other$ are origin-group indicators. Thus, coefficient β^j_1 reflects the gender difference in outcomes within the FSU group, while β^j_2 and β^j_3 capture the general differences of Natives and Other immigrants with respect to FSU immigrants.

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Vertical transmission estimation

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- Following hypothesis (1), we expect β4 and β5 have the same sign as β1
  - ✓ gender gaps in tertiary educational choices smaller within the FSU group, especially in sectors that in the West are traditionally very segregated, such as STEM or Pink collar.
- The structure of the estimation equation, where FSU men are the reference category implies that if the gender gap is narrowed among FSU immigrant, this is driven by the behavior of FSU women rather than by a difference in the choice made by FSU versus native men (hypothesis (2)).

Vertical transmission estimation

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- Controls:
  - ✓ vector Xi for family income and parental education
  - ✓ a vector of average (excluding-self) socio-economic status (SES) among eighth grade peers S8s−i ;
  - ✓ a fixed effect for the municipality of residence ηm
  - ✓ vector Math8 that contains eighth grade mathematics achievement and the ratio of mathematics score to language score
  - ✓ → isolate the direct transmission of preferences, net of skills.

Societal transmission estimation

$$y^j_{ismr} = \alpha^j_0 + \alpha^j_1 Female_i + \alpha^j_2 FSU\%8_s + \alpha^j_3 FSU\%8_s * female_i + X'_i\gamma^j + S8'_{s-i}\gamma^j + M'_m\eta^j + \rho^j_r + u_{imr} \quad (2)$$

- Societal diffusion through exposure of native students to FSU immigrants and their distinct gender norms (hypothesis 4).
- **Channels**:
- 1) peer or neighborhood effects
  - ✓ E.g. early exposure of natives to a high share of female science-minded FSU schoolmates might reduce the "stereotype threat" associated with STEM
  - ✓ local concentration of FSU immigrant women (mothers) who exhibit strong attachment to paid-work and/or have STEM careers, may serve as alternative role models for young native women.
- 2) local demand for STEM related extra-curricular activities or pressure on local schools to improve the level of STEM teaching, both of which may benefit native students.

Horizontal transmission estimation

- We exploit the variation in the density of FSU immigrants across schools as an indicator of exposure to FSU cultural norms.
- Exogenous to students' preferences because in Israel, families generally do not choose primary and middle schools, but are allocated to them according to catchment areas defined by neighborhood of residence
- → capture the combined effect of neighbors and schoolmates, the two potential channels of local diffusion

Horizontal transmission estimation

- Challenge for identification
- While there is no school choice, school level FSU concentration may be driven by immigrants' **residential choices** related to local educational and labor market characteristics and possible responses by native familie
- → assume that, conditional on observables (individual, school and municipality level characteristics), residential choices of native and FSU families are orthogonal to *gender norms* at the school level.

Horizontal transmission estimation

- FSU immigrants received a benefits package upon arrival that included housing support in the form of rental subsidies and access to state guaranteed mortgages.
- They were free to choose where to settle in Israel.
- 3 major forces determined location choices:
- 1) Government rental grants and subsidized mortgages offered by the Israeli "direct absorption" policy in the 1990's → constrained them to settle in low-rent-low-SES areas (Alterman, 1995; Gould *et al.*, 2009), which are not generally favorable to STEM.
- 2) → localities that already had a concentration of FSU immigrants from an earlier immigration wave in the 1970's.
- 3) housing shortage → rapid construction projects → location based on the availability of public land, → location of immigrants was supply-driven

Horizontal transmission estimation

$$y^j_{ismr} = \alpha^j_0 + \alpha^j_1 Female_i + \alpha^j_2 FSU\%8_s + \alpha^j_3 FSU\%8_s * female_i + X'_i\gamma^j + S8'_{s-i}\gamma^j + M'_m\eta^j + \rho^j_r + u_{imr} \quad (2)$$

Our coefficient of interest is α^j_3, which measures the association between the concentration of FSU students in the school cohort and the gender gap in natives' outcomes.

- We estimate Equation 2 on the sub-sample of native students
- Controls:
  - ✓ individual and school socio-economic status (SES)
  - ✓ vector of school characteristics, S8s−i
  - ✓ municipality of residence characteristics in the vector Mi:
    - share of FSU immigrants in 1983
    - female labor force participation rate
    - average years of schooling for adults
    - employment shares in the High-Tech sector

Data

Schooling Data

- We follow a synthetic cohort of 8-grade students in Israeli Hebrew language schools
- A total of 146,254 students
- Vast majority born in 1987 to 1990
- We identify immigrant students by country of birth as recorded in the Population Registry → 21.2% of the full population (18,3% in our sample)
- 14.3% were born in the FSU and Eastern European countries and 4% in other countries.
- Most immigrants arrive in Israel before entering primary school.
- This longitudinal data contains detailed individual level data
  - ✓ **eighth-grade** achievement,
  - ✓ **twelfth-grade** matriculation subject choices and performance,
  - ✓ **tertiary education** application preferences and entrance scores, study field and degree completion.

1) Measure of 8th grade achievement for the universe of schools and pupils (14 years old)

- Measure of individual 8th-grade achievement is taken from Israel's Growth and Effectiveness Measures for Schools (GEMS; "meitzav" in Hebrew)
  - ✓ a set of four standardized tests in Hebrew language arts, mathematics, science and technology, and English.
- These scores cover the full population and predates any track or study field choices.
  - ✓ In these years all schools in Israel with an 8th-grade , except most ultra-orthodox schools, were split into two balanced samples of equal size, with half the schools participating in GEMS tests in 2002 and the other half in 2003.
- → study sample of 61,238 students, of whom 18.4% are immigrants.

Table 1: Family SES measures and scores in eighth grade, by origin

	FSU immigrant	Native	Other immigrant	Ethiopia	EU & US
N	8,765	49,984	2,489	455	1,495
Share	0.14	0.82	0.04	0.01	0.02
Born 1987-89	0.99	1.00	0.98	0.95	0.99
Arrived by age 6	0.61	—	0.40	0.78	0.30
Unknown year of immigration	0.03	—	0.40	0.03	0.55
Family income quintiles					
Lowest	0.13	0.10	0.26	0.56	0.19
Second	0.28	0.15	0.21	0.29	0.19
Third	0.31	0.20	0.16	0.12	0.15
Fourth	0.21	0.26	0.14	0.03	0.17
Highest	0.07	0.30	0.23		0.30
Parents' maximal years of schooling					
<12	0.18	0.11	0.21	0.88	0.04
12	0.20	0.40	0.22	0.09	0.25
13-15	0.35	0.21	0.16		0.18
15<	0.27	0.28	0.41		0.52
Father's years of schooling	13.20	13.08	13.40	6.6	15.23
	(2.81)	(3.05)	(4.88)	(4.01)	(3.64)
Mother's years of schooling	13.42	13.18	13.05	6.26	14.67
	(2.67)	(2.76)	(4.43)	(3.56)	(3.04)
Religious school	0.06	0.21	0.33	0.53	0.30

$N = 61,238$. Study sample: all eighth grade students in Hebrew language schools who took at least two GEMS tests in either 2002 or 2003. Parents' maximal year of schooling is defined by the parent with the most years of schooling. Family income quintiles were calculated by the CBS over the entire population of students, including Arab and Ultra religious students. For continuous variables, standard errors are in parentheses.

The educational pipeline in Israel

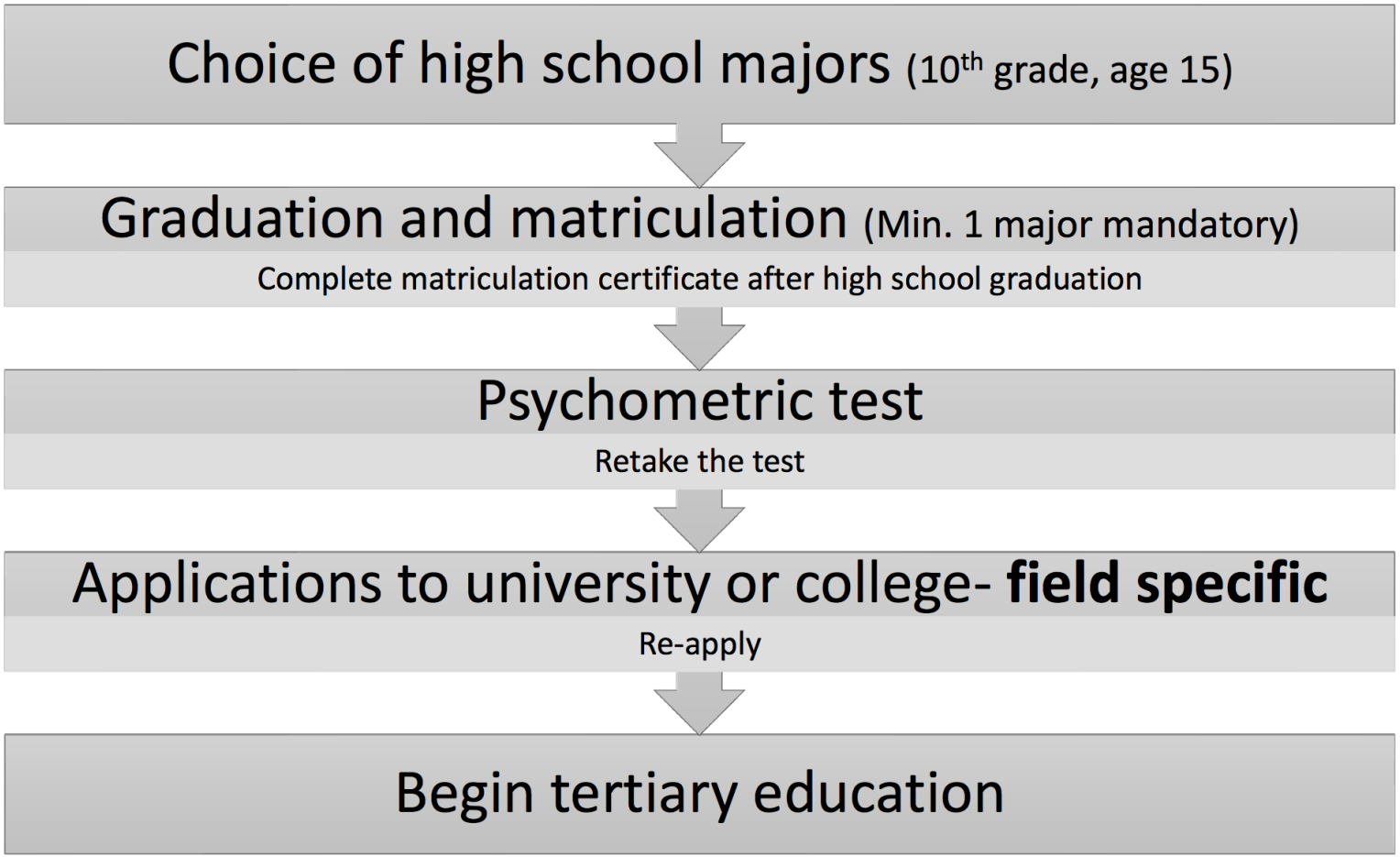
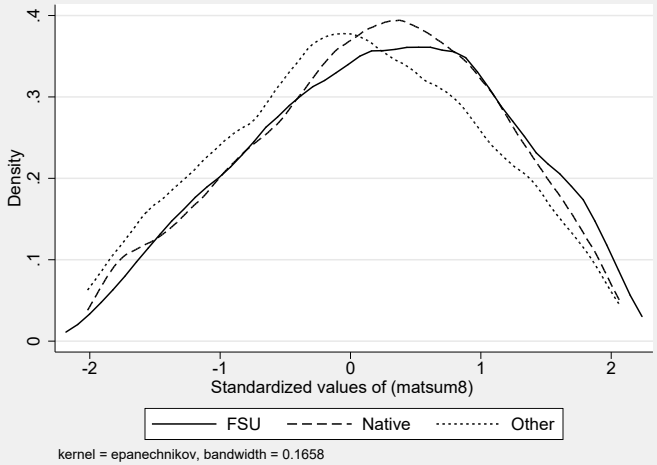
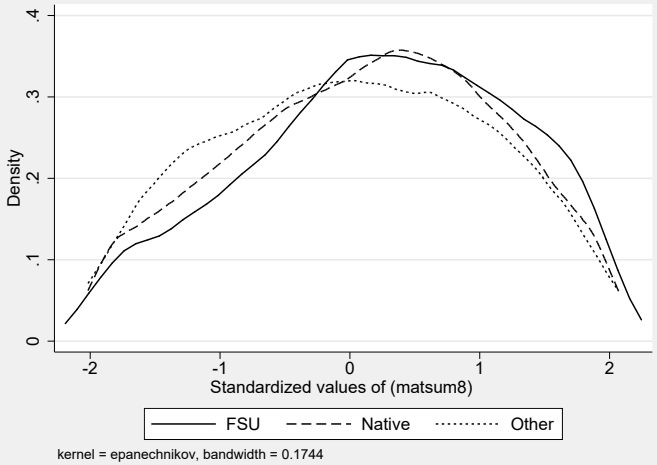


Figure 1: Distribution of eighth grade scores (standardized), by origin and subject

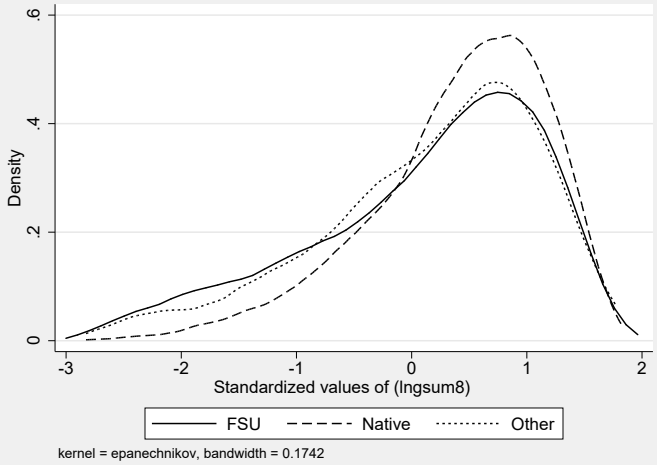
(a) Mathematics female



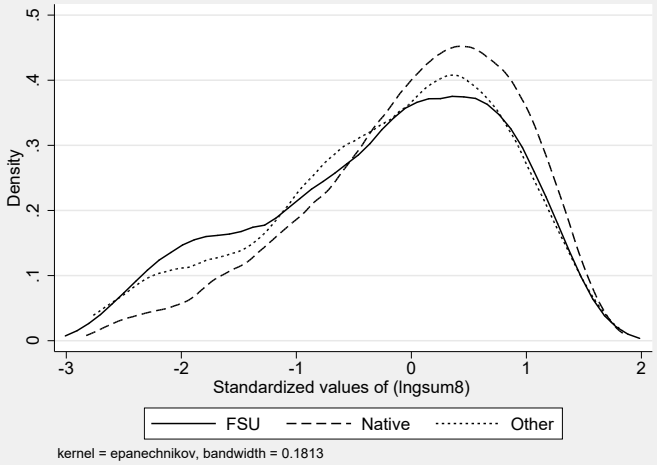
(b) Mathematics male



(c) literacy (Hebrew) female



(d) literacy (Hebrew) male



Notes: Distributions are presented for eighth grade students in Hebrew language schools who took each GEMS test in either 2002 or 2003. Scores are normalized to have a mean of 0 and standard deviation of 1, over the entire population of test takers. Density functions estimated using kernel-density of standardized GEMS scores.

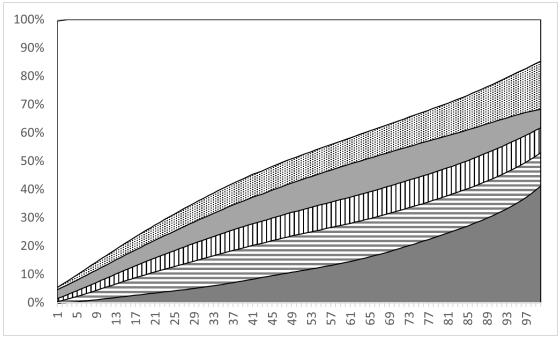
Table 2: Descriptive statistics of achievement and choice, by origin

	FSU immigrant	Native	Other immigrant	Ethiopia	EU & US
	Eight grade achievement				
Mathematics	54.99	52.82	49.72	33.47	55.86
	(24.11)	(23.85)	(24.35)	(21.33)	(23.19)
Hebrew	59.27	65.3	60.31	45.9	65.63
	(22.36)	(18.66)	(21.34)	(20.86)	(19.18)
	Tertiary education				
Studied in tertiary education	0.44	0.56	0.50	0.27	0.58
Grouped study field (as share of full sample)					
STEM	**0.18**	**0.16**	**0.14**	**0.04**	**0.17**
Engineering and architecture	0.11	0.10	0.07	0.03	0.09
Mathematics statistics and computer science	0.04	0.03	0.03		0.04
Biological sciences	0.02	0.02	0.02		0.03
Physical sciences	0.01	0.01	0.01		0.01
Pink collar	**0.05**	**0.10**	**0.09**	**0.06**	**0.10**
Education and teacher training	0.02	0.07	0.06	0.03	0.07
Health care professions	0.03	0.02	0.02		0.03
Social work	0.00	0.01	0.01		
Social science	**0.06**	**0.09**	**0.10**	**0.06**	**0.10**
Economics and Business	**0.09**	**0.10**	**0.08**	**0.06**	**0.08**
Business	0.06	0.07	0.05	0.05	0.05
Economics	0.03	0.03	0.03		
Other	**0.06**	**0.10**	**0.10**	**0.02**	**0.11**
Law	0.02	0.04	0.03		0.03
Humanities and regional studies	0.03	0.03	0.03	0.02	0.04
Arts	0.01	0.02	0.03		0.04
Medicine	0.00	0.01	0.00		
N	8,765	49,984	2,489	455	1,495
Share	0.14	0.82	0.04	0.01	0.02

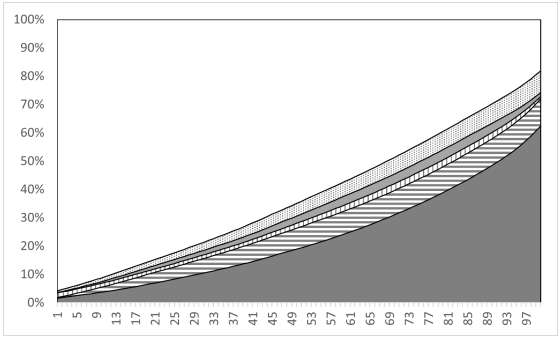
$N = 61,238$. Study sample: all eighth grade students in Hebrew language schools who took at least two GEMS tests in either 2002 or 2003. Mean GEMS scores are calculated over students who took each test. For continuous variables, standard errors are in parentheses.

Figure 2: Tertiary field choices within percentiles of eighth grade mathematics achievement, origin and gender

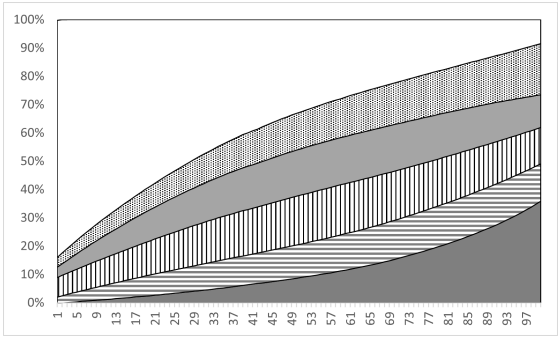
(a) FSU female



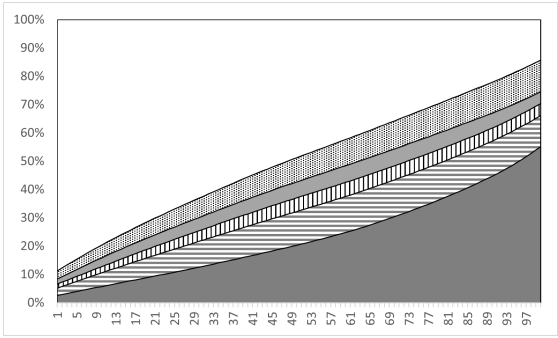
(b) FSU male



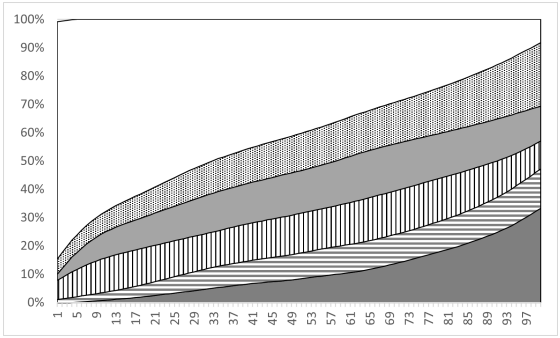
(c) Native female



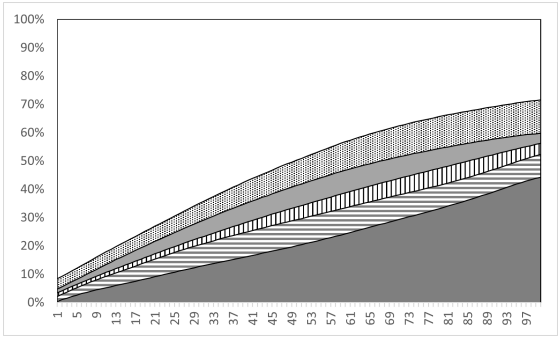
(d) Native male



(e) Other female



(f) Other male



Notes: Tertiary academic programs grouped as described in Table A2. Share in each category is calculated by gender and origin group for each GEMS percentile, percentile are defined over the entire population.

Results

Vertical transmission

Table 3: Tertiary study field choices, by gender and origin group

	STEM	Economics and business	Pink collar	Social science
Female	-0.092***	0.042***	0.059***	0.066***
	(0.008)	(0.006)	(0.004)	(0.005)
Native	-0.011	0.034***	0.024***	0.024***
	(0.007)	(0.004)	(0.002)	(0.003)
Other immigrant	-0.036***	0.009	0.019***	0.037***
	(0.013)	(0.008)	(0.006)	(0.007)
Female X Native	-0.017**	-0.034***	0.052***	0.025***
	(0.009)	(0.007)	(0.005)	(0.006)
Female X Other	-0.014	-0.037***	0.044***	0.006
	(0.016)	(0.012)	(0.012)	(0.013)
Constant	0.220***	0.069***	0.012***	0.026***
	(0.007)	(0.004)	(0.002)	(0.003)
Observations	61,238	61,238	61,238	61,238
R-squared	0.022	0.002	0.038	0.025
EU & US immigrant	-0.001	0.017	0.048***	0.055***
	(0.024)	(0.016)	(0.014)	(0.015)
Female X EU & US	-0.033	-0.056***	0.079***	-0.004
	(0.029)	(0.021)	(0.026)	(0.024)

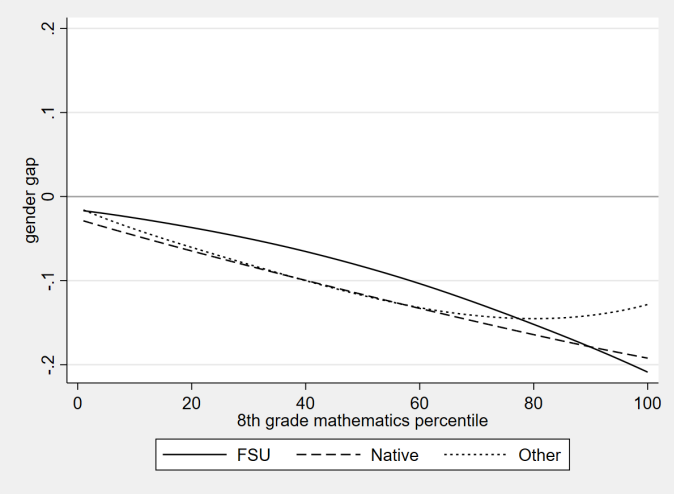
Omitted categories are male and FSU immigrants. Binary dependent variables vary by column and indicate the chosen category of tertiary education against all other options, including "No tertiary studies". Programs included in each category are detailed in Table A2. Coefficients are obtained from a LPM with cohort fixed-effects. Robust standard errors in parentheses.
* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 2: Vertical transmission - gender and origin gaps in tertiary study field choices

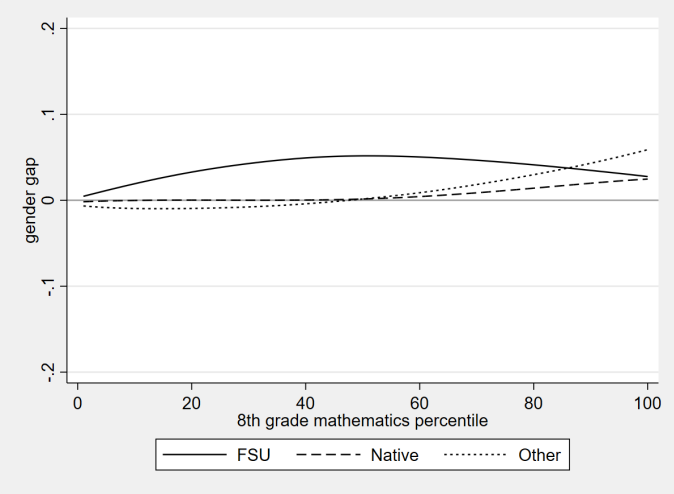
	STEM		Economics and business		Pink collar		Social science	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Female	-0.092***	-0.091***	0.042***	0.042***	0.059***	0.059***	0.066***	0.068***
	(0.008)	(0.010)	(0.006)	(0.006)	(0.004)	(0.004)	(0.005)	(0.007)
Native	-0.011	-0.003	0.034***	0.031***	0.024***	0.001	0.024***	0.014***
	(0.007)	(0.008)	(0.004)	(0.005)	(0.002)	(0.004)	(0.003)	(0.004)
Other immigrant	-0.036***	-0.021	0.009	0.022***	0.019***	-0.015**	0.037***	0.033***
	(0.013)	(0.013)	(0.008)	(0.008)	(0.006)	(0.006)	(0.007)	(0.008)
Female X Native	-0.017**	-0.024**	-0.034***	-0.035***	0.052***	0.049***	0.025***	0.024***
	(0.009)	(0.011)	(0.007)	(0.007)	(0.005)	(0.007)	(0.006)	(0.006)
Female X Other	-0.014	-0.014	-0.037***	-0.038***	0.044***	0.043***	0.006	0.005
	(0.016)	(0.017)	(0.012)	(0.012)	(0.012)	(0.011)	(0.013)	(0.015)
Prior achievement								
Mathemetics		0.111***		0.031***		0.011***		0.010***
		(0.002)		(0.002)		(0.002)		(0.001)
Mathematic/Hebrew		0.049***		-0.028*		-0.037**		-0.028**
		(0.016)		(0.015)		(0.014)		(0.014)
Controls								

Figure 3: Gender gaps in tertiary study field choices, by origin group

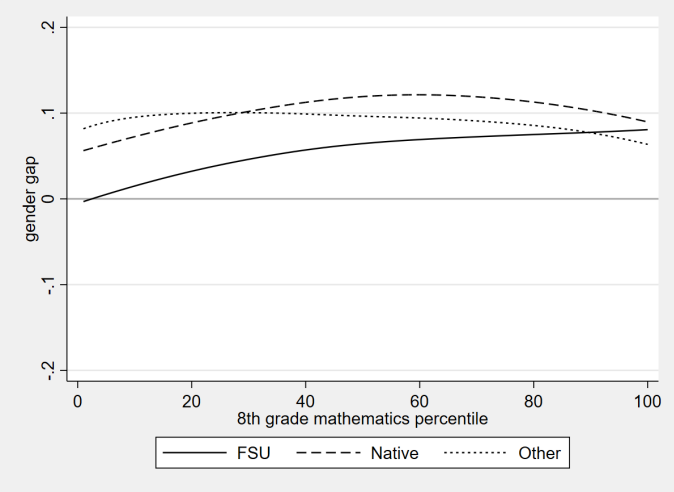
(a) STEM



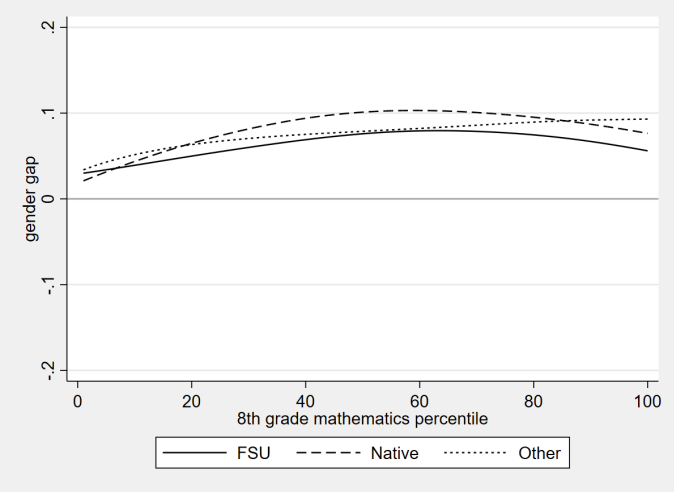
(b) Economics and business



(c) Pink collar



(d) Social science



Notes: Graphs represent the unconditional difference between the share of women and share of men choosing each of the four study field categories, by origin group, within eighth grade mathematics percentiles. Percentiles are calculated using all student in the sample who have a GEMS mathematics score. Lines are smoothed using Stata's Lowess procedure for kernel-weighted local polynomial smoothing

Table 5: Estimation of gender gaps in eight and twelfth grade achievement

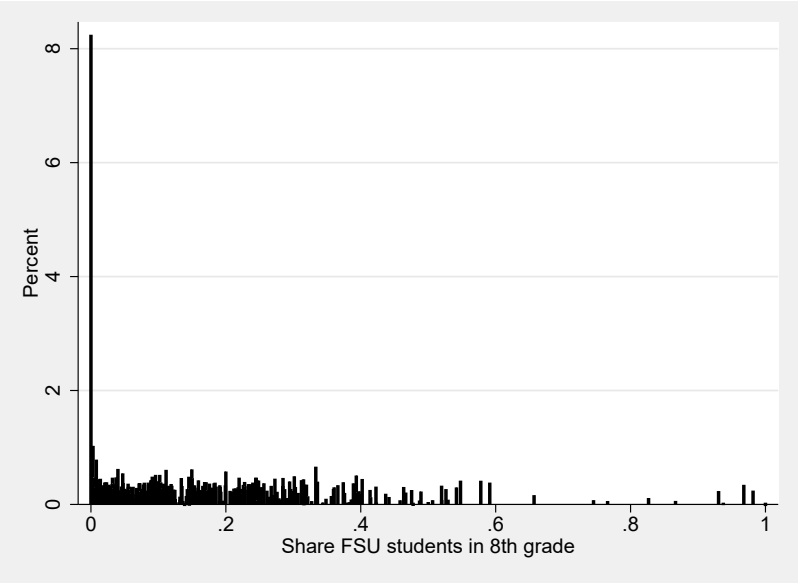
	Mathematics		Literacy (Hebrew)	
	8^{th}	12^{th}	8^{th}	12^{th}
Female	0.022	0.127***	0.385***	0.277***
	(0.026)	(0.019)	(0.026)	(0.021)
FemaleXNative	0.049*	0.018	0.013	-0.031
	(0.029)	(0.019)	(0.028)	(0.020)
FemaleXOther	-0.008	-0.031	0.011	-0.053
	(0.051)	(0.039)	(0.046)	(0.038)
Constant	-0.077*	-0.048**	-0.478***	-0.207***
	(0.046)	(0.023)	(0.038)	(0.023)
Controls				
Individual SES	X	X	X	X
Middle school char.	X	X	X	X
Observations	52,763	59,858	54,928	59,858
R-squared	0.131	0.083	0.173	0.088
High school FE		879		879
FemaleXNA and EU	-0.185**	-0.146**	-0.084	-0.146**
	(0.088)	(0.064)	(0.085)	(0.064)

Omitted categories are male and FSU immigrants. Dependent variables vary by column and are z-scores of test scores in mathematics and literacy (Hebrew) in eight and twelfth grade. Twelfth grade scores are weighted according to selected matriculation difficulty level. Coefficients are obtained from an OLS regression with cohort fixed-effects and high school FE for twelfth grade scores. Individual SES indicators include categorical variables for parents maximal years of education and family income quintiles. Omitted categories are parents with 12 years of schooling and third quintile of family income. Middle school characteristics include "leave-one-out" measures of average parental education and family income for others in students' eighth grade cohort in school, as well as an indicator if a school is a state-religious school. Standard errors clustered at the school level in each grade in parentheses. * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

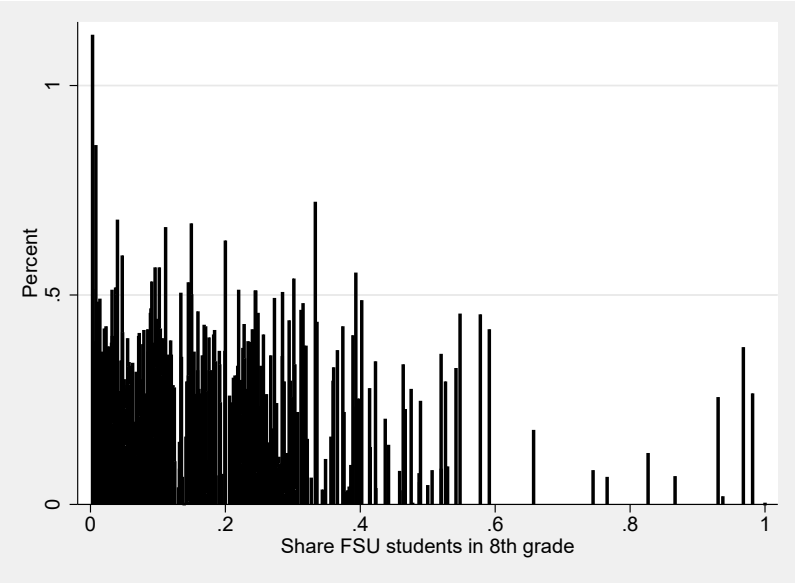
Horizontal diffusion

Figure 4: Distribution of students by the share of FSU immigrant in their school's eighth gra cohort

(a) All schools



(b) Schools with a positive share of FSU



Notes: Distributions are presented for native born eighth grade students whose father was not born in FSU and who attend Hebrew language schools.

Horizontal diffusion

Table 6: Correlation between municipality and school characteristics

	Municipality of residence				School average (z-scores)	
	% FSU 1983	% FSU 1995	Female employment	% in Hi-Tech	Family income	Parental education
Share FSU in 8th grade	1.595***	0.979***	-0.436***	-0.001	-0.046***	-0.058***
	(0.172)	(0.064)	(0.091)	(0.003)	(0.006)	(0.006)
Constant	0.043***	-0.037***	0.349***	0.129***	0.122***	0.129***
	(0.011)	(0.012)	(0.047)	(0.025)	(0.007)	(0.006)
Observations	596	598	584	597	515	514
R-squared	0.126	0.281	0.038	0.000	0.108	0.164

Notes: Observations are schools. Municipality level share of FSU immigrants and female employment rate are taken from 1995 and 1983 Census data, respectively. School level measures of parental education and family income were calculated from study's data set for school comprising at least 30 students at the eighth grade level. * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 7: Estimation of gender gaps among native with respect to eighth grade FSU concentration

	STEM		Economics and Business		Pink collar		Social science	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Female	-0.103***	-0.106***	0.010***	0.006*	0.105***	0.099***	0.091***	0.091***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Female X share FSU	0.018***	0.011**	0.015***	0.015***	-0.023***	-0.019***	-0.005	-0.006
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
School								
Share FSU	-0.026***	0.001	-0.007***	-0.009***	-0.023***	0.016***	-0.010***	-0.002
	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Share Other immigrants		-0.005***		-0.002		-0.008***		0.005***
		(0.002)		(0.002)		(0.002)		(0.002)
Average family income		0.007**		0.006**		-0.001		0.008***
		(0.003)		(0.003)		(0.003)		(0.003)
Average parental schooling		-0.003		-0.004		0.021***		-0.004
		(0.004)		(0.003)		(0.003)		(0.003)
Municipality								
Share FSU in 1983		0.002		0.005**		-0.003		-0.002
		(0.002)		(0.002)		(0.002)		(0.002)
Female LFP		-0.052		-0.025		-0.045		0.062**
		(0.034)		(0.030)		(0.029)		(0.029)
Average schooling		0.015**		0.004		-0.007		0.018***
		(0.007)		(0.006)		(0.006)		(0.006)
Share employed in high-tech		0.002***		0.002***		-0.001		-0.002**
		(0.001)		(0.001)		(0.001)		(0.001)
Controls								
Individual SES								
Constant	0.197***	0.171***	0.102***	0.108***	0.031***	0.041***	0.048***	0.015
	(0.003)	(0.016)	(0.003)	(0.014)	(0.002)	(0.014)	(0.002)	(0.014)
Observations	44,194	38,645	44,194	38,645	44,194	38,645	44,194	38,645

Sample comprises native students whose father was not born in the FSU, and in specifications with municipality characteristics limited to students living in municipalities established before the 1995 Census. Binary dependent variables vary by column and indicate the chosen category of tertiary education against all other options, including "No tertiary studies". Programs included in each category are detailed in Table A2. Coefficients are obtained from a LPM with cohort fixed-effects. Individual SES indicators include categorical variables for parents maximal years of education and family income quintiles. Omitted categories are parents with 12 years of schooling and third quintile of family income. Middle school characteristics include "leave-one-out" measures of average parental education and family income for others in students' eighth grade cohort in school as well as an indicator if a school is a state-religious school. Municipality characteristics refer to municipality of residence in twelfth grade and are standardized. Share of FSU is taken from the 1983 Census; female labor force participation from the 1995 Census; share of high-tech employees is taken from Central Bureau of Statistics (2017), at the district and sub-district levels only. Robust standard errors in parentheses. * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Horizontal diffusion

Table 4: Share of FSU immigrants in eighth grade, municipality and school characteristics

	Municipality of residence				School average		Share in school	
	% FSU 1983	Average schooling	Female LFP	% in Hi-Tech	Family income	Parental education	2^{nd} gen FSU	Other Immigrants
				One-by-one regressions				
Share FSU in 8th grade	1.595*** (0.172)	-0.087*** (0.017)	-0.436*** (0.091)	-0.001 (0.003)	-0.046*** (0.006)	-0.058*** (0.006)	0.489*** (0.016)	-0.296*** (0.076)
R-squared	0.126	0.042	0.038	0.000	0.108	0.164	0.015	0.025
				Combined regression				
Share FSU in 8th grade	0.051*** (0.009)	0.013 (0.025)	-0.212 (0.133)	0.003 (0.004)	-0.044*** (0.008)	-0.007 (0.008)	-0.012* (0.006)	-0.009* (0.005)
R-squared	0.361							

Observations are 506 schools. Municipality level share of FSU immigrants and female employment rate are taken from 1995 and 1983 Census data, respectively. School level measures of parental education and family income were calculated from study's data set for school comprising at least 30 students at the eighth grade level. Comibed regression includes district fixed-effects. * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 5: Societal transmission- gender gaps in tertiary choices and eighth grade FSU concentration

	STEM			Pink collar		
	(1)	(2)	(3)	(1)	(2)	(3)
Female	-0.103***	-0.109***	-0.105***	0.106***	0.104***	0.098***
	(0.003)	(0.003)	(0.004)	(0.003)	(0.005)	(0.003)
Share FSU	-0.033***	-0.007	-0.007*	-0.024***	0.013***	0.012***
	(0.004)	(0.005)	(0.004)	(0.002)	(0.004)	(0.002)
Female X share FSU	0.022***	0.016***	0.011**	-0.023***	-0.024***	-0.018***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)
School						
Share 2nd generation FSU		0.001	0.002		0.001	0.001
		(0.003)	(0.002)		(0.002)	(0.002)
Share Other immigrants		-0.005	-0.006***		-0.009***	-0.009***
		(0.003)	(0.002)		(0.004)	(0.002)
Average family income		0.006	0.006*		-0.002	-0.005*
		(0.005)	(0.003)		(0.006)	(0.003)
Average parental schooling		-0.002	-0.005		0.020**	0.022***
		(0.004)	(0.003)		(0.009)	(0.003)
Municipality						
Share FSU in 1983			-0.001			-0.002
			(0.003)			(0.002)
Female LFP			-0.013			-0.001
			(0.040)			(0.034)
Average schooling			0.023***			-0.007
			(0.007)			(0.007)
Share employed in high-tech			0.006***			0.003***
			(0.001)			(0.001)
Controls						
Individual SES		X	X		X	X
Municipality FE		X			X	
Constant	0.199***	0.180***	0.131***	0.032***	0.007	0.016
	(0.003)	(0.008)	(0.018)	(0.002)	(0.005)	(0.015)
Oster's δ		6.44	5.05		-41.32	-24.99
Observations	44,916	44,914	36,972	44,916	44,914	36,972
R^2	0.024	0.121	0.132	0.044	0.062	0.076

Sample comprises native students whose father was not born in the FSU, and in specifications with municipality characteristics limited to students living in municipalities established before the 1983 Census. Binary dependent variables vary by column and indicate the chosen category of tertiary education against all other options, including "No tertiary studies". Programs included in each category are detailed in Table A3. Coefficients are obtained from a LPM with cohort fixed-effects. Individual level controls include eighth grade mathematics score and ratio between mathematics and literacy scores as well as categorical variables for parents maximal years of education and family income quintiles. Middle school characteristics include leave-one-out measures of average parental education and family income for others in students' eighth grade cohort in school as well as an indicator if a school is a state-religious school, and the number of students in grade level. Municipality characteristics refer to municipality of residence in eighth grade, are standardized, and include a set of district fixed-effects. Share of FSU in municipality is taken from the 1983 Census; female labor force participation from the 1995 Census; share of high-tech employees in 1995 is taken from Central Bureau of Statistics (2017), at the district and sub-district levels only. Oster's δ is calculated for $R^2_{max} = 1.3\tilde{R}^2$. Robust standard errors in parentheses. * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 6: Societal transmission- gender gaps in achievement and eighth grade FSU concentration

	GEMS			
	Mathematics		Literacy (Hebrew)	
	(1)	(2)	(1)	(2)
Female	0.063***	0.086***	0.370***	0.386***
	(0.017)	(0.016)	(0.015)	(0.013)
Share FSU	-0.135***	0.031	-0.116***	0.041*
	(0.030)	(0.030)	(0.023)	(0.022)
Female X share FSU	0.034	0.006	0.013	-0.010
	(0.023)	(0.021)	(0.019)	(0.016)
Controls				
School		X		X
Municipality		X		X
Individual SES		X		X
Constant	-0.036	-0.144	-0.069***	-0.445***
	(0.030)	(0.151)	(0.026)	(0.119)
Observations	32,742	32,742	34,302	34,302
R^2	0.027	0.168	0.064	0.182

Dependent variables vary by column and are z-scores of test scores in mathematics and literacy (Hebrew) in eight grade and unit of observation is native students. Coefficients are obtained from an OLS regression with cohort fixed-effects. Individual SES indicators include categorical variables for parents maximal years of education and family income quintiles. Omitted categories are parents with 12 years of schooling and third quintile of family income. Middle school characteristics include a leave-one-out measures of average parental education and family income for others in students' eighth grade cohort in school, as well as an indicator if a school is a state-religious school. Standard errors clustered at the school level in each grade in parentheses. * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Additional Suggestive Evidence
Russian Network of Kindergarden

- In socialist countries, institution arrangements were designed in order to make full-time female employment compatible with maternity.
- Once in Israel, Russian immigrants have developed a network of private kindergarten (The Association of Immigrant Teachers - IGUM) that welcome children from 2 to 5 years old, form 7 am until 7 pm, and half-day on Fridays
- In contrast with standard Israeli state-subsidized and private kindergarten, which close around 4:30 pm.
- They offer a very large curriculum usually unavailable in public establishments, which includes the plastic arts, music, drama and theater, physical education, ballroom dancing, English, Russian, arithmetic, logic, and nature.
- Almost all the children who attend these kindergartens are born in Israel to parents from the former Soviet Union. Russian is the official language.
- In a way, Russian women have managed to reproduce some (private) institutions that allow them to reach the same level of work-family balance as they had in Soviet times.
- Illustration of the persistence of culture, but also of the reciprocal influence of culture and institutions.