

Cultural Norms and Neighborhood Exposure:  
Impacts on the Gender Gap in Math

Sanna Bergvall

Online Appendix

**Table OA1: Mitigation effect: alternative measures continued**

	(1)	(2)	(3)
	WVS	FLFP	FLFP Dec.
Girl	-0.064** (0.028)	-0.065** (0.027)	-0.065** (0.028)
Girl × WVS boy uni	-0.055* (0.032)		
Girl × FLFP		-0.051* (0.028)	
Girl × FLFP decade			-0.063** (0.029)
Girl × LLM FLFP	0.013 (0.053)	0.015 (0.052)	0.013 (0.052)
Girl × WVS boy uni × LLM FLFP	0.072** (0.029)		
Girl × FLFP × LLM FLFP		0.090*** (0.028)	
Girl × FLFP decade × LLM FLFP			0.076** (0.030)
Mitigation	0.085	0.105	0.088
se(mitigation)	0.062	0.061	0.061
p(mitigation = 0)	0.173	0.087	0.150
Observations	11,773	11,773	11,773

	Indicators		
Birth order	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes
Girl × country cont.	Yes	Yes	Yes
Girl × LLM cont.	Yes	Yes	Yes
Family FE	Yes	Yes	Yes

*Notes:* The dependent variable is the student's test score on the national standardized test in math, standardized to have a mean of zero and standard deviation of one. All columns use LLM area FLFP as the measure of neighborhood gender equality. Column 1 source-country-level of agreement with the statement "A university education is more important for a boy than for a girl." from the World Values Survey as the norm measure. Columns 2 and 3 uses source-country-level 1-FLFP rates measured between 2007–2010 or in the decade of mothers' immigration (around 1990), respectively. Country controls are standardized source-country GDP per capita and gross enrolment in secondary schooling, both interacted with a gender indicator. LLM controls are standardized population, average income and cultural density of the assigned local labor market area at the time of immigration, all interacted with a gender indicator. The estimate of the mitigation effect is obtained by linearly adding the coefficients for girl × LLM FLFP and girl × norms × LLM FLFP, the corresponding standard error and p-value are shown below. Standard errors in parentheses are clustered the source country × assigned local labor market × immigration year level. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01.

**Table OA2: Norm and mitigation effect: different cluster strategies**

	(1)	(2)	(3)	(4)
Norm effect (RQ1 sample)				
Girl	-0.072*** (0.017)	-0.072*** (0.012)	-0.072*** (0.011)	-0.072*** (0.011)
Girl × norms	-0.065** (0.031)	-0.065** (0.028)	-0.065*** (0.023)	-0.065*** (0.022)
Birth order	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes
Family FE	Yes	Yes	Yes	Yes
Observations	75,780	75,780	75,780	75,780
Cluster SE	Country × LLM	Country & LLM	Country × cohort	Family
Mitigation effect (RQ2 sample)				
Girl	-0.064** (0.028)	-0.064** (0.025)	-0.064** (0.026)	-0.064** (0.027)
Girl × norms	-0.054* (0.032)	-0.054 (0.037)	-0.054 (0.035)	-0.054* (0.031)
Girl × LLM FLFP	0.008 (0.052)	0.008 (0.071)	0.008 (0.052)	0.008 (0.051)
Girl × norms × LLM FLFP	0.085*** (0.028)	0.085** (0.026)	0.085*** (0.032)	0.085*** (0.027)
Birth order	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes
LLM controls	Yes	Yes	Yes	Yes
Family FE	Yes	Yes	Yes	Yes
Mitigation	0.093	0.093	0.093	0.093
p(mitigation = 0)	0.119	0.271	0.130	0.113
Observations	11,773	11,773	11,773	11,773
Cluster SE	Country × LLM	Country & LLM	LLM × im. year	Family

*Notes:* The dependent variable is the student's test score on the national standardized test in math, standardized to have a mean of zero and standard deviation of one. The effects are estimated for a one-standard-deviation increase in cultural gender norms. Country controls are standardized source-country GDP per capita and gross enrolment in secondary schooling, both interacted with a gender indicator. LLM controls are standardized population, average income and cultural density of the assigned local labor market area at the time of immigration, all interacted with a gender indicator. Standard errors are reported in parentheses, and the cluster strategy is reported for each column. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01.

**Table OA3: Effect of fathers' gender norms on the math gender gap**

	(1)	(2)	(3)	(4)	(5)	(6)
Girl	-0.064*** (0.007)	-0.062*** (0.005)	-0.059*** (0.006)	-0.064*** (0.008)	-0.064*** (0.008)	-0.064*** (0.008)
Norms	-0.034 (0.042)					
Girl × norms	-0.048*** (0.006)	-0.067*** (0.010)	-0.070*** (0.009)	-0.049** (0.021)	-0.049** (0.021)	-0.048** (0.022)
p(girl × norms = 0)	0.013	0.021	0.005	0.165	0.168	0.220
Observations	77,903	77,903	77,903	77,903	41,023	25,116

	Indicators					
Birth order	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	Yes	No	No	No
Father controls	No	No	Yes	No	No	No
Country controls	No	Yes	Yes	Yes	Yes	Yes
Family FE	No	No	No	Yes	Yes	No
Sibling-pair FE	No	No	No	No	No	Yes

*Notes:* The dependent variable is the student's test score on the national standardized test in math, standardized to have a mean of zero and standard deviation of one. The effects are estimated for a one-standard-deviation increase in father's cultural gender norms (0.09). Country controls are standardized source-country GDP per capita and gross enrolment in secondary schooling, both interacted with a gender indicator. Fathers' controls are cohort, education level, household income and family size. Standard errors in parentheses are clustered at the source country. The p-value from standard errors obtained using a wild cluster bootstrap are shown at the bottom. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01.

**Table OA4: Balance test for refugee placement policy: fathers**

	(1)	(2)	(3)	(4)
Norms	-0.128** (0.058)	-0.032 (0.044)	-0.037 (0.046)	-0.035 (0.046)
Cultural density		-0.516*** (0.045)	-0.498*** (0.047)	-0.498*** (0.047)
Father's edu (im.)		-0.007 (0.007)	0.001 (0.007)	0.003 (0.006)
Family size		-0.021* (0.012)	-0.033*** (0.012)	-0.027** (0.013)
Father's cohort				0.003 (0.004)
Observations	11,726	11,726	11,726	11,726

	Indicators			
Immigration year FE	No	No	Yes	Yes

*Notes:* The table reports the correlation between local labour market area FLFP and fathers' source-country gender norms and individual characteristics. The dependent variable is the FLFP of the assigned local labor market. All father characteristics are measured at the time of immigration. Cultural density is the share of local labor market residents from the same source country as the father who is being placed there. Standard errors are clustered at the source country × assigned local labor market × immigration year level. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01.

**Table OA5: Local labour market and mitigation effect: fathers**

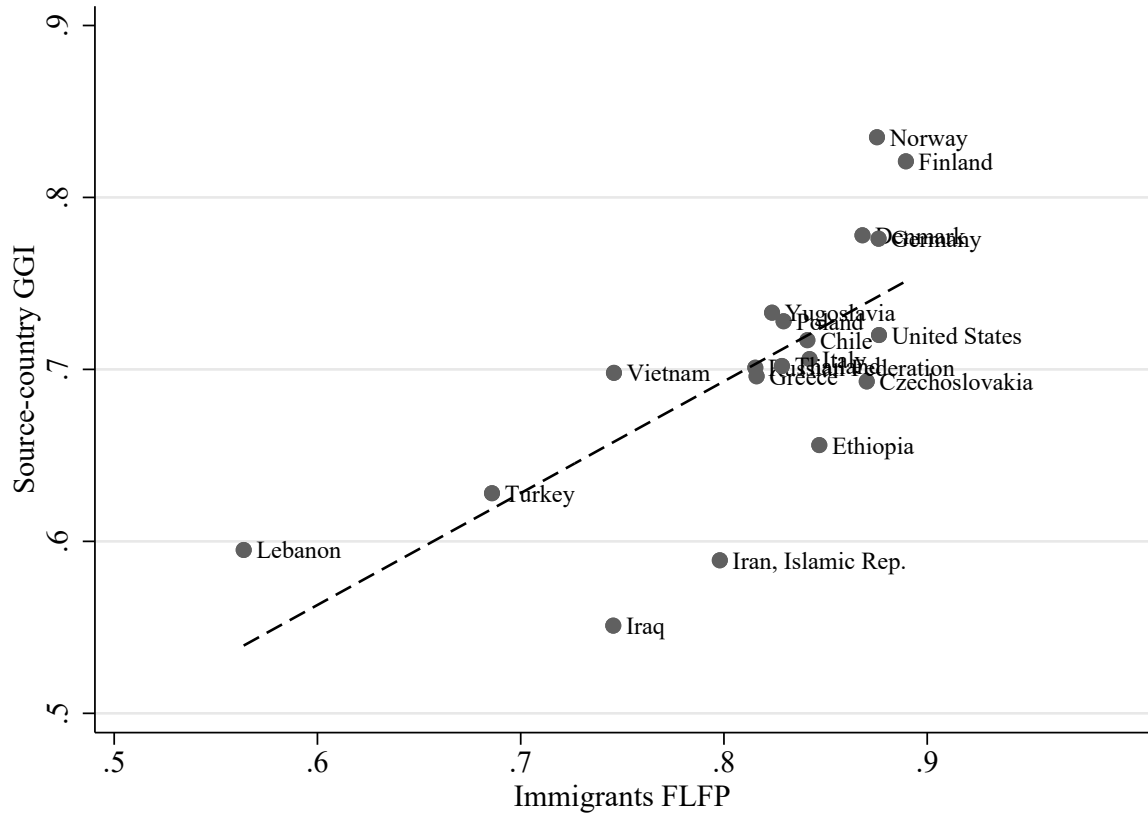
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Girl	-0.068** (0.027)	-0.067*** (0.020)	-0.066*** (0.020)	-0.067*** (0.020)	-0.070** (0.029)	-0.070** (0.029)	-0.076*** (0.029)
Girl × norms	-0.005 (0.032)	-0.049** (0.020)	-0.048** (0.020)	-0.040* (0.022)	-0.003 (0.033)	-0.003 (0.033)	-0.015 (0.033)
Girl × LLM FLFP		-0.006 (0.019)	-0.003 (0.018)	0.002 (0.030)	-0.013 (0.045)	-0.013 (0.045)	-0.009 (0.047)
Girl × norms × LLM FLFP		0.028 (0.022)	0.033 (0.021)	0.028 (0.021)	-0.005 (0.035)	-0.005 (0.035)	-0.009 (0.035)
Mitigation se(mitigation)		0.022 0.030	0.030 0.029	0.030 0.036	-0.018 0.054	-0.018 0.054	-0.018 0.057
p(mitigation = 0)		0.459	0.303	0.403	0.733	0.734	0.756
Observations	11,726	11,726	11,726	11,726	11,726	6,009	3,564

	Indicators						
Birth order	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	Yes	Yes	No	No	No
LLM × Im.Year FE	No	Yes	Yes	Yes	No	No	No
Country controls	Yes	No	No	Yes	Yes	Yes	Yes
LLM controls	Yes	No	No	Yes	Yes	Yes	Yes
Father controls	No	No	Yes	Yes	No	No	No
Family FE	Yes	No	No	No	Yes	Yes	No
Sibling-pair FE	No	No	No	No	No	No	Yes

*Notes:* The dependent variable is the student's test score on the national standardized test in math, standardized to have a mean of zero and standard deviation of one. Local labor market FLFP is measured at the assigned local labor market, in the year in which the father immigrated to Sweden. The effects are estimated for a one-standard-deviation increase in cultural gender norms (0.06), and a one standard deviation increase in local labor market FLFP (0.04). Country controls are standardized source-country GDP per capita and gross enrolment in secondary schooling, both interacted with a gender indicator. LLM controls are standardized population, average income and cultural density of the assigned local labor market area at the time of immigration, all interacted with a gender indicator. Fathers' controls are cohort, education level and family size, all of which are measured at time of immigration. The estimate of the mitigation effect is obtained by linearly adding the coefficients for girl × LLM FLFP and girl × norms × LLM FLFP, the corresponding standard error and p-value are shown below. Standard errors are clustered at the source country × assigned local labor market × immigration year level. \* p<0.1, \*\* p<0.05, \*\*\* p<0.01.

**Figure OA1: Correlation: GGI and immigrant FLFP rates**



*Notes:* The figure plots the correlation between source-country GGI 2018 score and the average current FLFP ratio of the first generation. The correlation coefficient is 0.7.