

On the economic prospects of non-Western migrants in Europe

Tijana Prokic-Breuer, Stan Vermeulen & Dinand Webbink

ONLINE APPENDIX

Appendix

Table A.1: Heterogeneity in intergenerational skills transmission by parental skills level

Child test score	Math test score		Language test score	
	(1)	(2)	(3)	(4)
Parental test score	0.304	0.281	0.311	0.278
	(0.013)	(0.013)	(0.014)	(0.014)
x Test score > median	0.018	0.019	0.023	0.023
	(0.020)	(0.020)	(0.020)	(0.020)
<i>Grandparent controls</i>		yes		yes
Observations	41,826	41,826	41,826	41,826

Notes: Least squares regressions. Sample: Pooled sample of all matched parent-children observations in the four education cohorts. Each column shows regression estimates of the slope from regressions of child skill rank on parental skill, as specified in Equation (2). Parent skill is interacted with a dummy taking the value of 1 if parents' test score is above the 50th percentile. The estimates are based on the sample of all natives and all non-western migrants. The left (right) panel uses scores in math (language) tests. Children's skills in math and language measured as percentile rank of test score in full sample of children taking the test in each test year. Parent skill rank is measured as the percentile rank of test score of parents in full sample of an education cohort. All regressions control for parent and child gender, parent survey indicators, and children test year fixed effects. Grandparent controls are grandparental highest obtained level of education, parental social background, number of parental siblings, age of grandfather and grandmother at time of birth of the parent. Standard errors clustered at the family level in parentheses. *Data sources:* Administrative data; pooled ITS survey dataset.

Table A.2: Cognitive skills of children and parents

Variables		Native	Non-Western	Morocco	Turkey	Suriname & Dutch Antilles
		(1)	(2)	(3)	(4)	(5)
Child skills						
Math skills	Mean	0.047	-0.318	-0.396	-0.368	-0.332
	SD	0.965	1.060	1.038	1.021	1.099
	Pct rank	51.6	41.7	39.3	39.9	41.8
Language skills	Mean	0.064	-0.389	-0.440	-0.682	-0.248
	SD	0.953	1.052	1.065	1.069	0.992
	Pct rank	52.5	40.0	38.7	32.4	43.4
Observations	Total number	39,792	1,640	350	460	633
Parent Skills						
Math skills	Mean	0.043	-0.644	-0.881	-0.706	-0.619
	SD	0.979	0.901	0.868	0.823	0.865
	Pct rank	48.6	28.8	22.5	26.9	29.3
Language skills	Mean	0.064	-0.643	-0.890	-0.840	-0.505
	SD	0.961	1.006	0.948	0.910	1.000
	Pct rank	49.0	29.5	23.1	23.8	33.3
Observations	Total number	24,720	1,130	229	327	446

Notes: Table reports means, SD, and the percentile rank for the variables indicated in column (1) for the native sample as well as for the most common migration backgrounds separately. The type of statistic reported is indicated in column (2). Children's cognitive skills are standardized with mean zero and SD one in the full sample of children taking the test in their cohort based on administrative data, percentile ranks are similarly calculated within cohort. Parent cognitive skills standardized with mean zero and SD one in the full sample of participants from each education cohort. Percentile ranks are similarly calculated within cohort. *Data sources:* Administrative data; pooled ITS survey dataset.

Table A.3: Regression estimates of the migrant-native outcome gap for parents and children separately – standardized skill measures

	Non-western	Morocco	Turkey	Suriname & Dutch Antilles
	(1)	(2)	(3)	(4)
Parent skills				
	Panel A: Math			
Migration background:	-0.542	-0.713	-0.589	-0.553
Yes	(0.028)	(0.058)	(0.047)	(0.041)
R-squared	0.054	0.042	0.041	0.042
Observations	25,850	24,949	25,047	25,166
	Panel B: Language			
Migration background:	-0.608	-0.823	-0.764	-0.511
Yes	(0.031)	(0.064)	(0.052)	(0.048)
R-squared	0.040	0.027	0.029	0.024
Observations	25,850	24,949	25,047	25,166
Child skills				
	Panel C: Math			
Migration background:	-0.225	-0.240	-0.246	-0.279
Yes	(0.027)	(0.056)	(0.048)	(0.043)
R-squared	0.040	0.036	0.036	0.037
Observations	41,432	40,142	40,252	40,425
	Panel D: Language			
Migration background:	-0.302	-0.308	-0.550	-0.210
Yes	(0.026)	(0.057)	(0.050)	(0.039)
R-squared	0.041	0.033	0.038	0.033
Observations	41,432	40,142	40,252	40,425

Notes: Least squares regressions. Sample: Pooled sample of all matched parent-children observations in the four education cohorts. The estimates in column (1) are based on the sample of all natives and all non-Western migrants. The estimates in the next columns contain all natives and a specific sample of migrants. Dependent variables: Standardized math skills of parents in Panel A; Standardized language skills of parents in Panel B; Standardized math skills of children in Panel C; Standardized language skills of children in Panel D. Parent skills are standardized by education cohort using the full cohort sample. Children's skills in math and language are standardized by test year cohort using the full sample of children taking the test in each test year. Parent skills regressions control for parent gender and parent survey indicators. Child skills regressions control for child gender, parent survey indicators, and children test year fixed effects. Robust standard errors in parentheses. *Data sources:* Administrative data; pooled ITS survey dataset.

Table A.4: Immigrant-native outcome gap for parents and children - including all controls

	Non-western	Morocco	Turkey	Suriname & Dutch Antilles
	(1)	(2)	(3)	(4)
Parent skills				
	Panel A: Math			
Migration background:	-9.20	-11.56	-8.10	-11.47
Yes	(0.81)	(1.64)	(1.36)	(1.17)
R-squared	0.125	0.112	0.112	0.114
Observations	25,850	24,949	25,047	25,166
	Panel B: Language			
Migration background:	-9.87	-12.99	-11.22	-9.53
Yes	(0.82)	(1.66)	(1.33)	(1.28)
R-squared	0.125	0.113	0.115	0.111
Observations	25,850	24,949	25,047	25,166
Child skills				
	Panel C: Math			
Migration background:	-3.24	-3.05	-2.69	-4.83
Yes	(0.74)	(1.50)	(1.28)	(1.17)
R-squared	0.062	0.059	0.059	0.059
Observations	41,432	40,142	40,252	40,425
	Panel D: Language			
Migration background:	-4.82	-3.55	-9.34	-3.65
Yes	(0.73)	(1.48)	(1.25)	(1.11)
R-squared	0.068	0.061	0.065	0.061
Observations	41,432	40,142	40,252	40,425

Notes: Least squares regressions. Sample: Pooled sample of all matched parent-children observations in the four education cohorts. The estimates in column (1) are based on the sample of all natives and all non-western migrants. The estimates in the next columns contain all natives and a specific sample of migrants. Dependent variables: Percentile rank of math skills of parents in Panel A; percentile rank of language skills of parents in Panel B; percentile rank of math skills of children in Panel C; percentile rank of language skills of children in Panel D. Parent skill rank is measured as the percentile rank of test score of parents in full sample of an education cohort. Children's skills in math and language measured as percentile rank of test score in full sample of children taking the test in each test year. Parent skills regressions control for parent gender and parent survey indicators. Child skills regressions control for child gender, parent survey indicators, and children test year fixed effects. Both parent and child skills regressions additionally control for grandparental highest obtained level of education, parental social background, number of parental siblings, and age of grandfather and grandmother at time of birth of the parent. Robust standard errors in parentheses. *Data sources:* Administrative data; pooled ITS survey dataset.

Table A.5. Estimates of the persistence of inequality in skills for specific countries

	Non-Western	Morocco	Turkey	Suriname & Dutch Antilles
	(1)	(2)	(3)	(4)
Math test score				
Parental test score	0.277 (0.005)	0.276 (0.005)	0.277 (0.005)	0.278 (0.005)
Parental group mean	0.098 (0.044)	0.040 (0.073)	0.112 (0.069)	0.144 (0.075)
Persistence rate	0.375	0.316	0.389	0.422
<i>Grandparent controls</i>				
Parental test score	0.258 (0.005)	0.257 (0.005)	0.258 (0.005)	0.258 (0.005)
Parental group mean	0.042 (0.046)	-0.011 (0.075)	0.025 (0.070)	0.096 (0.077)
Persistence rate	0.300	0.246	0.283	0.352
Observations	41,826	40,528	40,640	40,814
Language test score				
Parental test score	0.292 (0.005)	0.293 (0.005)	0.292 (0.005)	0.293 (0.005)
Parental group mean	0.206 (0.042)	0.068 (0.069)	0.376 (0.062)	0.125 (0.077)
Persistence rate	0.498	0.361	0.668	0.418
<i>Grandparent controls</i>				
Parental test score	0.265 (0.005)	0.266 (0.006)	0.265 (0.006)	0.266 (0.006)
Parental group mean	0.119 (0.044)	-0.013 (0.071)	0.273 (0.063)	0.037 (0.080)
Persistence rate	0.374	0.253	0.539	0.303
Observations	41,826	40,528	40,640	40,814

Notes: Least squares regressions. Sample: Pooled sample of all matched parent-children observations in the four education cohorts. Each column shows regression estimates of the slope and intercept from regressions of child skill rank on parental skill rank and the average test scores of parental natives or migrant parents, as specified in Equation (2). The estimates in column (1) are based on the sample of all natives and all non-western migrants. The estimates in the next columns contain all natives and a specific sample of migrants. The top (bottom) panel uses scores in math (language) tests. Children's skills in math and language measured as percentile rank of test score in full sample of children taking the test in each test year. Parent skill rank is measured as the percentile rank of test score of parents in full sample of an education cohort. Average test scores of parental natives and migrant parents are measured as the group-average percentile rank of test score of the full sample of an education cohort. All regressions control for parent and child gender, parent survey indicators, and children test year fixed effects. Grandparent controls are grandparental highest obtained level of education, parental social background, number of parental siblings, age of grandfather and grandmother at time of birth of the parent. Standard errors clustered at the family level in parentheses. *Data sources:* Administrative data; pooled ITS survey dataset.

Table A.6: Non-Dutch language spoken at home for students in PISA 2009 – 2015 with a Native Dutch, Turkish, or Moroccan migration background.

		Pisa 2009	Pisa 2012	Pisa 2015
Language other than Dutch spoken at home		(1)	(2)	(3)
Migration background:				
	Native	-0.613 (0.038)	-0.591 (0.060)	-0.517 (0.041)
	Moroccan	-0.386 (0.066)	-0.311 (0.092)	-0.176 (0.069)
Constant		0.625	0.598	0.526
Observations		3,914	3,567	4,422

Notes: Least squares regressions. Sample: PISA participants from the Netherlands with a native Dutch, Turkish, or Moroccan migration background from the 2009 (column 1), 2012 (column 2), and 2015 (column 3) PISA waves. Migration background is derived from students' country of birth and the country of birth of their parents. Dependent variable: Dummy variable taking the value of 1 if students indicated speaking a non-Dutch language at home in the student survey. Reference category for migration background is 'Turkish'. Standard errors (in parentheses) calculated using PISA's survey weights. *Data sources:* Pisa 2009, Pisa 2012, Pisa 2015.

Table A.7. Coefficients of the control variables in column (2) and (4) of table 5

Variables	Math test score	Language test score
Parental test score	0.258 (0.005)	0.265 (0.005)
Parental group mean	0.042 (0.046)	0.119 (0.044)
<i>Number of parent siblings</i>		
Number of siblings: 1	0.020 (0.640)	0.701 (0.646)
Number of siblings: 2	0.681 (0.656)	1.573 (0.660)
Number of siblings: 3 or more	1.662 (0.672)	1.514 (0.675)
<i>Grandparent education</i>		
Grandparent education: lower secondary	1.116 (0.448)	1.844 (0.445)
Grandparent education: upper secondary	2.327 (0.483)	3.073 (0.483)
Grandparent education: tertiary	5.189 (0.609)	6.277 (0.610)
<i>Grandparent social background</i>		
Blue-collar worker	-2.112 (0.596)	-0.674 (0.591)
Employer with staff	-0.062 (0.817)	1.499 (0.826)
Lower white-collar worker	-0.643 (0.698)	1.380 (0.692)
Middle white-collar worker	-1.279 (0.648)	1.164 (0.650)
Professionals	0.176 (0.719)	2.251 (0.725)
Other	-2.448 (0.699)	-0.978 (0.696)
<i>Grandparent age at birth parents:</i>		
Age grandfather at time of parent birth: 21-25	0.506 (1.435)	-0.402 (1.311)
Age grandfather at time of parent birth: 26-30	0.506 (1.463)	0.164 (1.338)
Age grandfather at time of parent birth: 31-35	0.388 (1.501)	-0.213 (1.379)
Age grandfather at time of parent birth: 36-40	0.448 (1.568)	0.088 (1.456)
Age grandfather at time of parent birth: 41+	-1.094 (1.680)	-1.078 (1.575)
Age grandmother at time of parent birth: 21-25	0.585 (0.770)	1.664 (0.736)
Age grandmother at time of parent birth: 26-30	1.964 (0.829)	2.941 (0.797)
Age grandmother at time of parent birth: 31-35	2.470 (0.924)	4.252 (0.892)
Age grandmother at time of parent birth: 36-40	3.312 (1.085)	4.085 (1.062)
Age grandmother at time of parent birth: 41+	4.744 (1.500)	6.517 (1.484)
R-squared	0.122	0.130
Observations	41,826	41,826

Notes: Least squares regressions. Sample: Pooled sample of all matched parent-children observations in the four education cohorts. Each column shows regression estimates of the slope from regressions of child skill rank on parental skill rank and the average test scores of parental natives or migrant parents (parental group mean), as specified in Equation (2). The estimates are based on the sample of all natives and all non-western migrants. The left (right) panel uses scores in math (language) tests. Children's skills in math and language measured as percentile rank of test score in full sample of children taking the test in each test year. Parent skill rank is measured as the percentile rank of test score of parents in full sample of an education cohort. Average test scores of parental natives and migrant parents are measured as the group-average percentile rank of test score of the full sample of an education cohort. All regressions control for parent and child gender, parent survey indicators, and children test year fixed effects. Omitted categories: Number of siblings: none; grandparent education: primary; grandparent social background: employer without staff; age grandfather at time of parent birth: 20 years or lower; age grandmother at time of parent birth: 20 years or lower. Standard errors clustered at the family level in parentheses. *Data sources:* Administrative data; pooled ITS survey dataset.

Table A.8. Estimates of the persistence of inequality in skills – primary school educated grandparent subsample

Child test score	Math test score		Language test score	
	(1)	(2)	(3)	(4)
Parental test score	0.261 (0.013)	0.255 (0.013)	0.271 (0.013)	0.264 (0.013)
Parental group mean	0.002 (0.065)	-0.007 (0.069)	0.108 (0.060)	0.075 (0.064)
Persistence rate	0.263	0.248	0.379	0.339
<i>Grandparent controls</i>		yes		yes
Observations	7,686	7,686	7,686	7,686

Notes: Least squares regressions. Sample: Pooled sample of matched parent-children observations in the four education cohorts with the lowest level of grandparental education. Each column shows regression estimates of the slope from regressions of child skill rank on parental skill rank and the average test scores of parental natives or migrant parents (parental group mean), as specified in Equation (2). The estimates are based on the sample of natives and non-western migrants with the lowest level of grandparental education. The left (right) panel uses scores in math (language) tests. Children's skills in math and language measured as percentile rank of test score in full sample of children taking the test in each test year. Parent skill rank is measured as the percentile rank of test score of parents in full sample of an education cohort. Average test scores of parental natives and migrant parents are measured as the group-average percentile rank of test score of the full sample of an education cohort. All regressions control for parent and child gender, parent survey indicators, and children test year fixed effects. Grandparent controls are parental social background, number of parental siblings, age of grandfather and grandmother at time of birth of the parent. Standard errors clustered at the family level in parentheses. *Data sources:* Administrative data; pooled ITS survey dataset.