Reducing or Widening the Gap? How the Educational Aspirations and Expectations of Turkish and Majority Families Develop During Lower Secondary Education in Germany

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Online Appendix

Caption:

The electronic supplementary materials contain additional descriptive information, the results of the regressions utilized for predictions in Figure 2 and Figure 4, exact values shown in Figure 2 and Figure 4, results on interactions of immigrant background with social background and performance variables, robustness checks, and analyses of missing data.

Table A.1. Distributions by origin group (imputed data)

	Grade	Majority M/%	SD	Turkey M/%	SD	All min	max	miss
Outcomes:								
Parents' aspirations	6	0.64		0.84		0	1	0.32
	7	0.65		0.76		0	1	0.37
	8	0.59		0.59		0	1	0.43
	9	0.57		0.54		0	1	0.53
Parents' expectations	6	0.55		0.55		0	1	0.33
	7	0.58		0.55		0	1	0.38
	8	0.53		0.46		0	1	0.43
	9	0.53		0.49		0	1	0.53
Students' aspirations	5	0.70		0.73		0	1	0.09
	6	0.71		0.71		0	1	0.11
	7	0.71		0.74		0	1	0.19
	8	0.62		0.70		0	1	0.22
	9	0.60		0.59		0	1	0.30
Students' expectations	5	0.57		0.59		0	1	0.12
	6	0.53		0.47		0	1	0.13
	7	0.50		0.47		0	1	0.21
	8	0.44		0.36		0	1	0.23
	9	0.45		0.38		0	1	0.30
Controls:								
Parents' highest school degree:	F							0.25
Lower secondary at most		0.11		0.64		0	1	
Intermediate degree		0.39		0.20		0	1	
Upper secondary		0.50		0.16		0	1	
Parents' highest ISEI	F	55.43	19.77	34.92	19.79	11.7	89.0	0.12
Male	F	0.53		0.47		0	1	0.00
School type:	5[a]							0.00
Lower-level secondary school ('Hauptschule' and multitrack schools)		0.18		0.16		0	1	
Intermediate-level secondary school ('Realschule')		0.21		0.27		0	1	
Comprehensive school		0.17		0.34		0	1	
Upper-level secondary school ('Gymnasium')		0.43		0.22		0	1	
Grade point average (German, math)[b]	5	2.55	0.76	2.91	0.78	1	6	0.15
	6	2.66	0.77	2.98	0.75	1	6	0.22
	7	2.70	0.78	3.01	0.77	1	6	0.23
	8	2.75	0.78	3.02	0.74	1	6	0.30
	9	2.77	0.80	3.09	0.70	1	6	0.34
N		3 640		346		3 986		

Notes. min: minimum. max: maximum. miss: share of missing values (1.00=100%).

F: measured in the first interview. Due to unit nonresponse, the timepoint can vary.

All distributions are based on imputed data.

[a] Only exemplary values from Grade 5. For Grades 6 to 9, 2% to 14% of school type values were imputed.

[b] High values indicate poor grades (1 'very good' to 6 'failing').

Source. Own calculations based on NEPS-SC3.

Table A.2. Logistic regressions of high aspirations and expectations (log. odds ratios, standard errors in parentheses)

	Parents' aspirations	**Parents' expectations**	**Students' aspirations**	**Students' expectations**
Origin group (Ref.: Majority)				
Turkey	2.271***	0.702	1.383**	1.302**
	(0.636)	(0.562)	(0.485)	(0.408)
Grade (Ref.: 6 for parents, 5 for students)				
6			0.496*	0.236
			(0.248)	(0.237)
7	−0.085	−0.212	0.553*	0.464
	(0.283)	(0.305)	(0.275)	(0.251)
8	−0.718*	−0.707*	0.188	−0.140
	(0.295)	(0.325)	(0.283)	(0.260)
9	−0.899**	−0.717*	−0.280	−0.532*
	(0.298)	(0.334)	(0.282)	(0.266)
Interactions Origin * Grade				
Turkey * 6			−0.152	−0.394*
			(0.182)	(0.168)
Turkey * 7	−0.687**	−0.439*	−0.151	−0.233
	(0.265)	(0.206)	(0.215)	(0.203)
Turkey * 8	−1.094***	−0.497*	0.285	−0.409*
	(0.280)	(0.250)	(0.216)	(0.208)
Turkey * 9	−1.150***	−0.410	−0.077	−0.387
	(0.320)	(0.300)	(0.221)	(0.209)
School type (Ref.: Lower/intermediate level secondary school)				
Comprehensive school	1.837***	2.029***	1.577***	1.481***
	(0.131)	(0.143)	(0.119)	(0.114)
Comprehensive * 6			0.067	0.137
			(0.123)	(0.127)
Comprehensive * 7	0.294*	−0.007	0.078	0.433**
	(0.149)	(0.153)	(0.157)	(0.154)
Comprehensive * 8	0.136	0.198	0.256	0.556***
	(0.153)	(0.175)	(0.158)	(0.167)
Comprehensive * 9	0.080	0.025	0.040	0.472**
	(0.165)	(0.184)	(0.159)	(0.168)
Upper level school	3.121***	3.901***	4.024***	3.108***
	(0.144)	(0.156)	(0.198)	(0.115)
Upper level * 6			0.085	−0.085
			(0.249)	(0.133)
Upper level * 7	0.566**	0.024	−0.296	−0.177
	(0.173)	(0.173)	(0.257)	(0.144)
Upper level * 8	0.580**	0.296	−0.292	0.131
	(0.178)	(0.194)	(0.240)	(0.156)
Upper level * 9	0.462**	0.026	−0.310	0.328*
	(0.179)	(0.205)	(0.240)	(0.159)
Grade point average	−0.587***	−1.124***	−0.413***	−0.683***
	(0.081)	(0.090)	(0.073)	(0.066)
Grade point average * 6			−0.143	−0.153
			(0.089)	(0.086)
Grade point average * 7	0.034	0.203	−0.100	−0.311***
	(0.103)	(0.114)	(0.096)	(0.092)

	Parents' aspirations	Parents' expectations	Students' aspirations	Students' expectations
Grade point average * 8	0.104	0.213	−0.218*	−0.274**
	(0.106)	(0.121)	(0.102)	(0.094)
Grade point average * 9	0.126	0.286*	−0.108	−0.111
	(0.108)	(0.127)	(0.100)	(0.097)
Gender (Ref.: Female)				
Male	−0.232**	−0.387***	−0.309***	−0.044
	(0.083)	(0.084)	(0.064)	(0.059)
Parents' highest ISEI (in units of 10 pt.)	0.153***	0.159***	0.141***	0.116***
	(0.028)	(0.028)	(0.023)	(0.020)
Parents' highest school degree (Ref.: Lower secondary at most)				
Intermediate	0.278*	0.298	0.265*	0.221
	(0.134)	(0.154)	(0.114)	(0.117)
Upper secondary	1.046***	0.884***	0.703***	0.677***
	(0.157)	(0.164)	(0.131)	(0.131)
Turkey * Parents' highest ISEI (10 pt.)	−0.172*	−0.149*	−0.109	−0.149**
	(0.068)	(0.060)	(0.059)	(0.051)
Turkey * Comprehensive	−1.502***	−1.330***	−0.640**	−0.711***
	(0.273)	(0.270)	(0.225)	(0.209)
Turkey * Upper level	−2.280***	−2.335***	−0.924*	−0.786**
	(0.334)	(0.302)	(0.432)	(0.251)
Turkey * Grade point average	0.434*	0.713***	0.121	0.289**
	(0.171)	(0.159)	(0.129)	(0.109)
Intercept	−0.410	0.154	−0.321	−0.440
	(0.284)	(0.298)	(0.244)	(0.225)
N	15944	15944	19930	19930

Notes. Statistical significance based on robust standard errors (clustered at the student level): * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

Source. Own calculations based on NEPS-SC3.

Table A.3. Predicted probabilities of high aspirations and expectations for Turkish origin and majority students and parents

		Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Diff. 9-5/6
	Parents' aspirations						
Majority	Predicted probabilities		61.2	63.3	58.0	56.2	−5.1
	S.E.		0.72	0.69	0.69	0.70	0.83
	p						0.000
Turkey	Predicted probabilities		88.1	82.3	68.7	64.5	−23.6
	S.E.		2.34	2.98	4.28	5.49	5.29
	p						0.000
Diff. T-M	AME * 100		26.9	19.0	10.7	8.3	−18.6
	S.E.		2.49	3.06	4.33	5.55	5.46
	p		0.000	0.000	0.014	0.134	0.001
	Parents' expectations						
Majority	Predicted probabilities		52.0	55.8	52.4	53.0	1.0
	S.E.		0.62	0.64	0.63	0.66	0.78
	p						0.206
Turkey	Predicted probabilities		66.4	65.1	57.6	60.6	−5.8
	S.E.		3.40	3.91	4.17	5.37	5.45
	p						0.292
Diff. T-M	AME * 100		14.3	9.3	5.2	7.6	−6.7
	S.E.		3.45	3.96	4.23	5.45	5.53
	p		0.000	0.019	0.216	0.165	0.223
	Students' aspirations						
Majority	Predicted probabilities	67.0	68.3	70.2	62.1	59.5	−7.5
	S.E.	0.65	0.64	0.67	0.65	0.67	0.86
	p						0.000
Turkey	Predicted probabilities	80.4	79.7	81.6	78.5	70.9	−9.5
	S.E.	2.08	2.09	2.23	2.54	2.83	2.89
	p						0.001
Diff. T-M	AME * 100	13.4	11.4	11.4	16.4	11.4	−2.1
	S.E.	2.19	2.20	2.37	2.67	2.95	3.05
	p	0.000	0.000	0.000	0.000	0.000	0.499
	Students' expectations						
Majority	Predicted probabilities	53.3	50.9	48.6	44.2	45.8	−7.6
	S.E.	0.66	0.65	0.69	0.66	0.66	0.86
	p						0.000
Turkey	Predicted probabilities	68.7	58.8	58.4	49.2	51.4	−17.3
	S.E.	2.50	2.86	3.07	3.20	3.13	3.21
	p						0.000
Diff. T-M	AME * 100	15.4	7.9	9.8	5.0	5.6	−9.8
	S.E.	2.59	2.94	3.18	3.29	3.20	3.33
	p	0.000	0.007	0.002	0.133	0.080	0.003

Notes. Predicted probabilities and standard errors based on logistic regressions controlling for gender, parents' highest ISEI, parents' highest school degree, school type, and grade point average; including interactions of immigrant background with ISEI, school type, and grades (Table A2).

The last column (Diff. 9-5/6) shows probability differences between the first and the last measurement wave (AME * 100). The last row (Diff. T-M) shows differences by immigrant background in each year (AME * 100). The rightmost cell in this row shows the difference-in-difference, i.e., how much origin differences change between the first and the last measurement, or how much the temporal change varies by immigrant background, respectively.

Source. Own calculations based on NEPS-SC3.

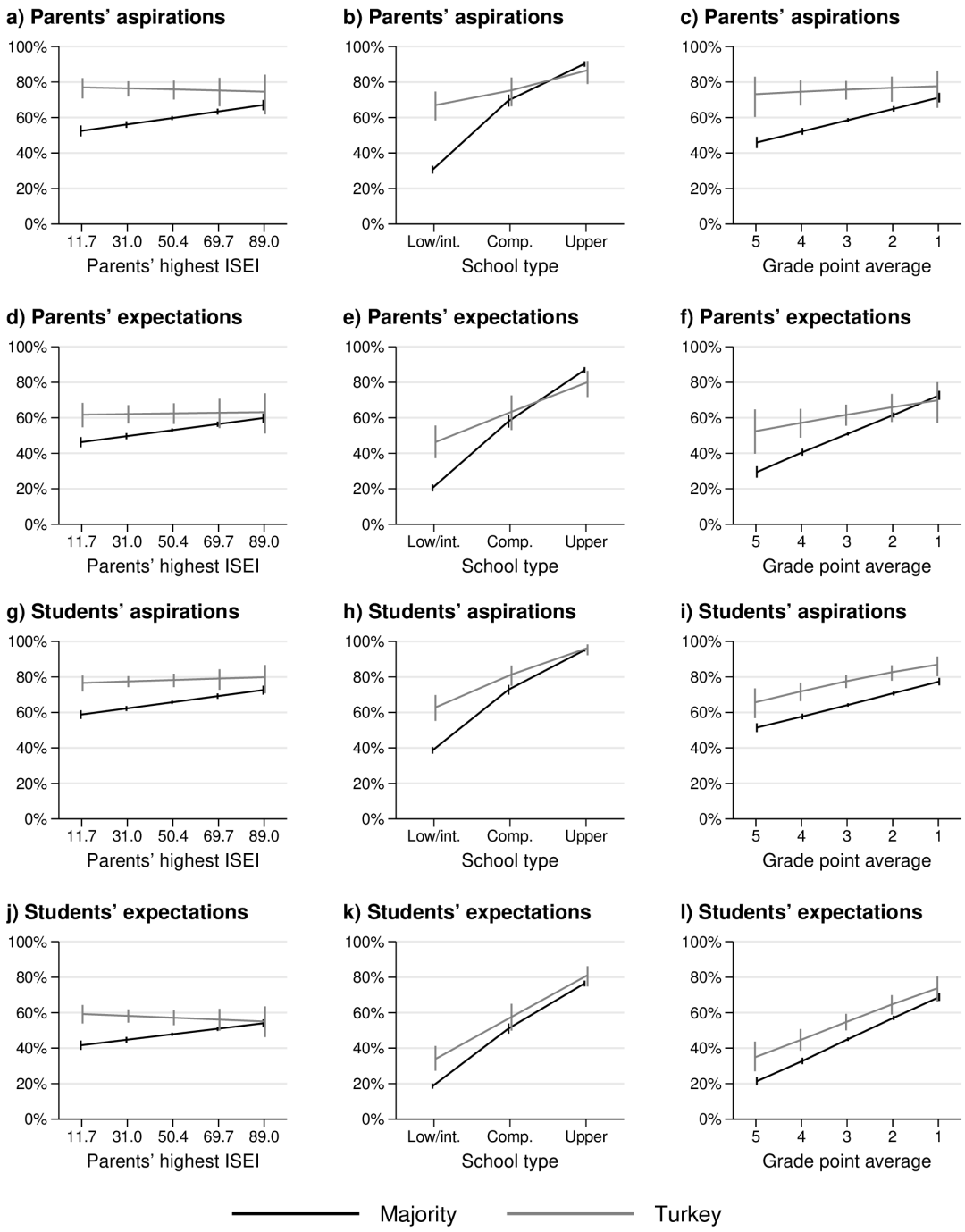

Figure A.1. Interactions of immigrant background with parents' highest ISEI, school type, and grade point average (predicted probabilities and 95% confidence intervals)

Notes. All interactions based on logistic regression analyses (see Table A.2).

Parents highest ISEI: Predictions are shown across the full scale with equidistant values. Values can be described by the following occupations (according to the corresponding or closest ISCO codes): ISEI=11.7 farm labourer, 31.0 hairdresser, 50.4 accounting and bookkeeping clerk, 69.7 air traffic controller, 89.0 judge.

School type: Low/int. lower-level or intermediate-level secondary schools; Comp. comprehensive schools. Upper. upper-level secondary school.

Grade point average: Values range from 5 ('insufficient') to 1 ('very good'). For the value 6 ('failing'), no predictions are made, as grade point averages of 5.5 or 6.0 are very rare (0.2% of student-waves).

Source. Own calculations based on NEPS-SC3.

Table A.4. Multinomial regressions of aspirational and expectational trajectories (log. odds ratios, standard errors in parentheses)

Outcome variable	**Parents' asp.**			**Parents' exp.**			**Students' asp.**			**Students' exp.**		
Outcome trajectory (Ref.: Stable high)	**Stable low**	**Downward**	**Upward**	**Stable low**	**Downward**	**Upward**	**Stable low**	**Downward**	**Upward**	**Stable low**	**Downward**	**Upward**
Origin group (Ref.: Majority)												
Turkey	−1.573	1.681	0.373	−0.194	2.563	0.952	−2.157	−1.716	−2.645	−3.063*	−2.087	−1.833
	(2.203)	(1.651)	(2.237)	(1.965)	(1.693)	(1.593)	(1.609)	(1.466)	(1.677)	(1.445)	(1.342)	(1.945)
School type, Grade 5 (Ref.: Lower/int. level)												
Comprehensive school, Grade 5							−1.260***	−0.346	−0.834*	−1.408***	−0.561	−0.967*
							(0.282)	(0.276)	(0.342)	(0.297)	(0.313)	(0.379)
Upper level school, Grade 5							−4.109***	−0.795**	−3.222***	−3.141***	−0.687*	−2.274***
							(0.482)	(0.252)	(0.383)	(0.301)	(0.308)	(0.367)
School type, Grade 6 (Ref.: Lower/int.)												
Comprehensive school, Grade 6	−1.231***	−0.277	−0.334	−0.898**	−0.018	−0.429						
	(0.266)	(0.297)	(0.427)	(0.315)	(0.387)	(0.401)						
Upper level school, Grade 6	−2.141***	−0.055	−0.570	−2.355***	0.373	−1.164**						
	(0.289)	(0.285)	(0.409)	(0.331)	(0.337)	(0.387)						
School type, Grade 9 (Ref.: Lower/int.)												
Comprehensive school, Grade 9	−1.518***	−1.319***	−1.011*	−2.284***	−1.791***	−1.224**	−1.564***	−1.209***	−0.679	−1.671***	−1.422***	−0.574
	(0.297)	(0.315)	(0.469)	(0.324)	(0.383)	(0.424)	(0.315)	(0.276)	(0.402)	(0.300)	(0.306)	(0.421)
Upper level school, Grade 9	−2.957***	−2.896***	−1.403***	−3.892***	−3.490***	−1.820***	−3.177***	−2.596***	−0.151	−2.630***	−2.389***	−0.336
	(0.303)	(0.274)	(0.388)	(0.317)	(0.316)	(0.367)	(0.536)	(0.247)	(0.345)	(0.280)	(0.278)	(0.358)

Outcome variable	**Parents' asp.**			**Parents' exp.**			**Students' asp.**			**Students' exp.**		
Outcome trajectory (Ref.: Stable high)	**Stable low**	**Downward**	**Upward**	**Stable low**	**Downward**	**Upward**	**Stable low**	**Downward**	**Upward**	**Stable low**	**Downward**	**Upward**
Grade point average, Grade 5							0.680***	0.536***	0.381**	0.986***	0.524***	0.447**
							(0.110)	(0.101)	(0.140)	(0.109)	(0.106)	(0.142)
Grade point average, Grade 6	0.729***	0.422***	0.312	1.235***	0.535***	0.930***						
	(0.111)	(0.121)	(0.174)	(0.132)	(0.140)	(0.153)						
Grade point average, Grade 9	0.198	0.319**	−0.063	0.526***	0.676***	−0.085	0.455***	0.424***	0.159	0.669***	0.606***	0.168
	(0.109)	(0.120)	(0.160)	(0.132)	(0.140)	(0.155)	(0.109)	(0.104)	(0.142)	(0.106)	(0.0988)	(0.134)
Gender (Ref.: Female)												
Male	0.364*	0.261	0.154	0.539***	0.496**	−0.012	0.515***	0.360**	0.147	0.141	0.248*	0.005
	(0.142)	(0.168)	(0.205)	(0.155)	(0.180)	(0.173)	(0.134)	(0.128)	(0.170)	(0.130)	(0.125)	(0.168)
Parents' highest ISEI (in units of 10 pt.)	−0.200***	−0.069	−0.112	−0.209***	−0.027	−0.075	−0.217***	−0.112*	−0.136*	−0.190***	−0.088*	−0.081
	(0.0458)	(0.0507)	(0.0687)	(0.0512)	(0.0604)	(0.0572)	(0.0478)	(0.0445)	(0.0590)	(0.0442)	(0.0416)	(0.0547)
Parents' education (Ref.: Lower secondary at most)												
Intermediate	−0.365	−0.118	0.303	−0.390	0.103	−0.173	−0.358	−0.068	0.110	−0.340	−0.047	0.103
	(0.242)	(0.292)	(0.378)	(0.320)	(0.387)	(0.339)	(0.241)	(0.243)	(0.307)	(0.279)	(0.266)	(0.358)
Upper secondary	−1.473***	−0.716*	−0.456	−1.231***	−0.443	−0.681	−1.057***	−0.433	−0.293	−1.106***	−0.578*	−0.433
	(0.277)	(0.327)	(0.423)	(0.333)	(0.406)	(0.348)	(0.274)	(0.265)	(0.339)	(0.309)	(0.285)	(0.373)
Turkey * Parents' highest ISEI (10 pt.)	0.140	0.059	−0.067	0.206	−0.068	0.124	−0.001	0.108	0.215	0.223	0.146	0.106
	(0.213)	(0.132)	(0.217)	(0.147)	(0.148)	(0.140)	(0.145)	(0.109)	(0.139)	(0.116)	(0.111)	(0.160)
Turkey * Comprehensive, Grade 5							−1.209	1.190	0.574	0.377	0.266	0.868
							(223.6)	(0.816)	(1.039)	(0.879)	(0.860)	(1.125)
Turkey * Upper level, Grade 5							−9.098	−0.075	1.179	−0.213	−0.859	0.606

Outcome variable	**Parents' asp.**			**Parents' exp.**			**Students' asp.**			**Students' exp.**		
Outcome trajectory (Ref.: Stable high)	**Stable low**	**Downward**	**Upward**	**Stable low**	**Downward**	**Upward**	**Stable low**	**Downward**	**Upward**	**Stable low**	**Downward**	**Upward**
							(845.7)	(1.051)	(1.393)	(1.217)	(1.038)	(1.343)
Turkey * Comprehensive, Grade 6	−1.594	0.523	−2.523	1.619	1.100	1.109						
	(339.4)	(0.764)	(494.4)	(154.4)	(154.4)	(154.4)						
Turkey * Upper level, Grade 6	−8.284	0.470	−9.302	2.759	0.484	1.423						
	(799.8)	(0.947)	(1460.2)	(154.4)	(154.4)	(154.4)						
Turkey * Comprehensive, Grade 9	3.129	0.944	2.924	0.530	0.724	−0.231	2.237	0.478	0.137	0.995	1.152	−0.135
	(339.4)	(0.823)	(494.4)	(154.4)	(154.4)	(154.4)	(223.6)	(0.843)	(1.109)	(0.905)	(0.845)	(1.152)
Turkey * Upper level, Grade 9	−2.217	1.665	−1.415	−0.673	1.997	−1.040	−2.255	0.838	−2.279	1.080	1.692	−0.393
	(603.6)	(0.975)	(970.9)	(207.4)	(154.4)	(154.4)	(682.1)	(1.100)	(440.5)	(1.160)	(0.964)	(1.229)
Turkey * Grade point average, Grade 5							−0.009	0.220	0.287	−0.045	0.250	0.079
							(0.317)	(0.315)	(0.365)	(0.315)	(0.311)	(0.438)
Turkey * Grade point average, Grade 6	−0.535	−0.545	−0.142	−0.817*	−0.401	−0.637						
	(0.478)	(0.345)	(0.484)	(0.413)	(0.390)	(0.380)						
Turkey * Grade point average, Grade 9	−0.340	−0.345	−0.065	−0.427	−0.659	−0.004	−0.085	−0.239	0.129	−0.070	−0.158	0.030
	(0.558)	(0.386)	(0.514)	(0.444)	(0.381)	(0.385)	(0.398)	(0.340)	(0.426)	(0.370)	(0.314)	(0.485)
Intercept	0.704	−1.166*	−1.153	−0.593	−2.857***	−1.260*	−0.227	−1.363**	−1.136	0.216	−0.751	−0.705
	(0.446)	(0.500)	(0.688)	(0.496)	(0.604)	(0.580)	(0.468)	(0.464)	(0.581)	(0.463)	(0.456)	(0.585)

Notes. Reference category: 'stable high'. Significance levels: * $p<0.05$, ** $p<0.01$, *** $p<0.001$. N=3 986.

Source. Own calculations based on NEPS-SC3.

Table A.5. Predicted patterns of aspirational and expectational trajectories

	Trajectory pattern:	**stable low**	**downward**	**upward**	**stable high**
	Parents' aspirations				
Majority	Predicted probabilities	33.3	11.8	4.0	50.9
	S.E.	0.70	0.65	0.41	0.69
Turkey	Predicted probabilities	5.6	33.3	6.0	55.1
	S.E.	9.20	7.03	9.27	7.19
Difference T-M	AME * 100	−27.6	21.5	2.0	4.2
	S.E.	9.21	7.12	9.29	7.24
	p	0.003	0.003	0.828	0.565
	Parents' expectations				
Majority	Predicted probabilities	40.4	8.0	6.0	45.6
	S.E.	0.62	0.52	0.49	0.62
Turkey	Predicted probabilities	18.5	22.6	16.5	42.4
	S.E.	3.77	6.07	4.32	6.49
Difference T-M	AME * 100	−21.9	14.6	10.5	−3.2
	S.E.	3.85	6.11	4.37	6.55
	p	0.000	0.017	0.017	0.623
	Students' aspirations				
Majority	Predicted probabilities	26.1	16.0	5.6	52.3
	S.E.	0.62	0.67	0.43	0.62
Turkey	Predicted probabilities	9.7	17.3	9.5	63.4
	S.E.	1.70	2.93	2.13	3.32
Difference T-M	AME * 100	−16.4	1.3	3.9	11.1
	S.E.	1.82	3.06	2.19	3.43
	p	0.000	0.663	0.073	0.001
	Students' expectations				
Majority	Predicted probabilities	39.2	17.2	5.9	37.8
	S.E.	0.64	0.67	0.44	0.61
Turkey	Predicted probabilities	22.5	24.1	6.9	46.5
	S.E.	2.53	3.64	2.37	3.81
Difference T-M	AME * 100	−16.6	6.9	1.0	8.7
	S.E.	2.62	3.71	2.42	3.87
	p	0.000	0.063	0.675	0.025

Notes. Predicted probabilities and standard errors based on multinomial logistic regressions with controls (gender, parents' highest ISEI, parents' highest school degree, school type in first and last wave, and grade point average in first and last wave; including interactions of immigrant background with ISEI, school type, and grades; see Table A4).

Difference T-M: probability differences by immigrant background (average marginal effects * 100).

Source. Own calculations based on NEPS-SC3.

Robustness of results

To assess the robustness of our main results (Figure 2 and Figure 4), we reran them with different specifications for aspirations and expectations, immigrant origin, and the analysis sample. Figures A.2 and A.3 show the results of the main analyses in the first column of subplots (a, f, k, p). The results for models with different specifications are shown in columns 2 to 5.

Lower threshold of high aspirations or expectations

In years 8 and 9, a more differentiated instrument for aspired-to and expected degrees was administered that used different types of higher education entrance qualifications (general 'Abitur' and restricted types, e.g., 'Fachhochschulreife'). In our main analyses, we defined high aspirations and expectations with the general 'Abitur' only.

With a lower degree threshold for high aspirations in years 8 and 9 (Figure A.2 b, g, l, q), the decline in aspirations was less pronounced for all four variables of interest compared to that in our main analyses (a, f, k, p). The origin gap for parents' expectations was slightly smaller. This reduction seemed to be caused by the increasing expectations of majority parents rather than the decreasing expectations of parents from Turkey, pointing to the fact that majority parents are more familiar with alternative routes to higher education.

Applying the lower threshold of high aspirations to the prediction of aspirational trajectories, the patterns with high aspirations at the end of lower secondary education (stable high, upward change) were more prevalent (Figure A.3 b, g, l, q). However, we found the same patterns of significant differences between origin groups for all outcome variables.

Immigration-specific differences of the second generation

Immigration-specific differences often vary by immigrant generation. In our main analyses, we analysed Turkish origin students from the first generation to the second generation (generation 1.0, indicating that a student was born abroad, to generation 2.75, indicating that at least one parent was born abroad).

In educational research, the second generation has often been of particular interest for scholars (e.g., Heath et al. 2008), as it comprises students who grew up and attended school in the receiving country but whose parents grew up in a different system.

When we restricted our sample of Turkish origin students to the second generation in the narrower sense (generation 2.0: both parents were born in Turkey;), the group-specific

prediction curves did not differ with regard to their level or slope (Figure A.2 c, h, m, r). Further, we found similar probabilities of intraindividual trajectories, while the statistical significance of origin differences was reduced due to lower numbers of Turkish origin students (Figure A.3 c, h, m, r).

Further, we checked if our specification was sensitive to the exclusion of third generation immigrants from Turkey (generation 3.0-3.75, indicating that at least one grandparent was born in Turkey). This would not lead to different conclusions about the group-specific predictions and intraindividual trajectories (Figures A.2 and A.3 d, i, n, s).

Immigration-specific differences in low, intermediate, and comprehensive schools

Arguably, origin gaps in high educational aspirations and expectations are considered more problematic if they occur for low or intermediate school types. In the highest-tier school type in the German system ('Gymnasium'), the majority of students can expect to attain the highest degree ('Abitur'), and origin gaps may be more attributable to a less ambitious majority population than to overambitious immigrants.

When we restricted our sample to students who started their lower secondary education in school types below the highest school type (Figures A.2 e, j, o, t), two differences could be observed compared to the results of the analyses based on the full sample. First, the predicted share of students with high aspirations or expectations was markedly lower in all years for both origin groups. Second, the differences between majority and Turkish origin students were more pronounced. Most strikingly, the origin differences still remained statistically significant at the end of lower secondary education for all four outcome variables (and not only students' aspirations as in our main analyses). This is in line with previous research that focused students in low and intermediate school types (Dollmann 2017; Salikutluk 2016). However, in accordance with our main analyses, the origin gaps for parents' aspirations and students' expectations shrank over the course of lower secondary education.

When we compared intraindividual trajectories between different sample specifications, we found that the stable high pattern was overall less prevalent in lower, intermediate, and comprehensive school types for both origin groups (Figures A.3 e, j, o, t). Further, the absolute origin differences in the probabilities of stable low patterns were more pronounced for all four outcome variables. Further, Turkish origin parents reported stable high aspirations and stable high expectations more often than majority parents, when we focussed on lower, intermediate, and comprehensive schools. In the main analyses, a higher probability of stable high trajectories was only found for students.

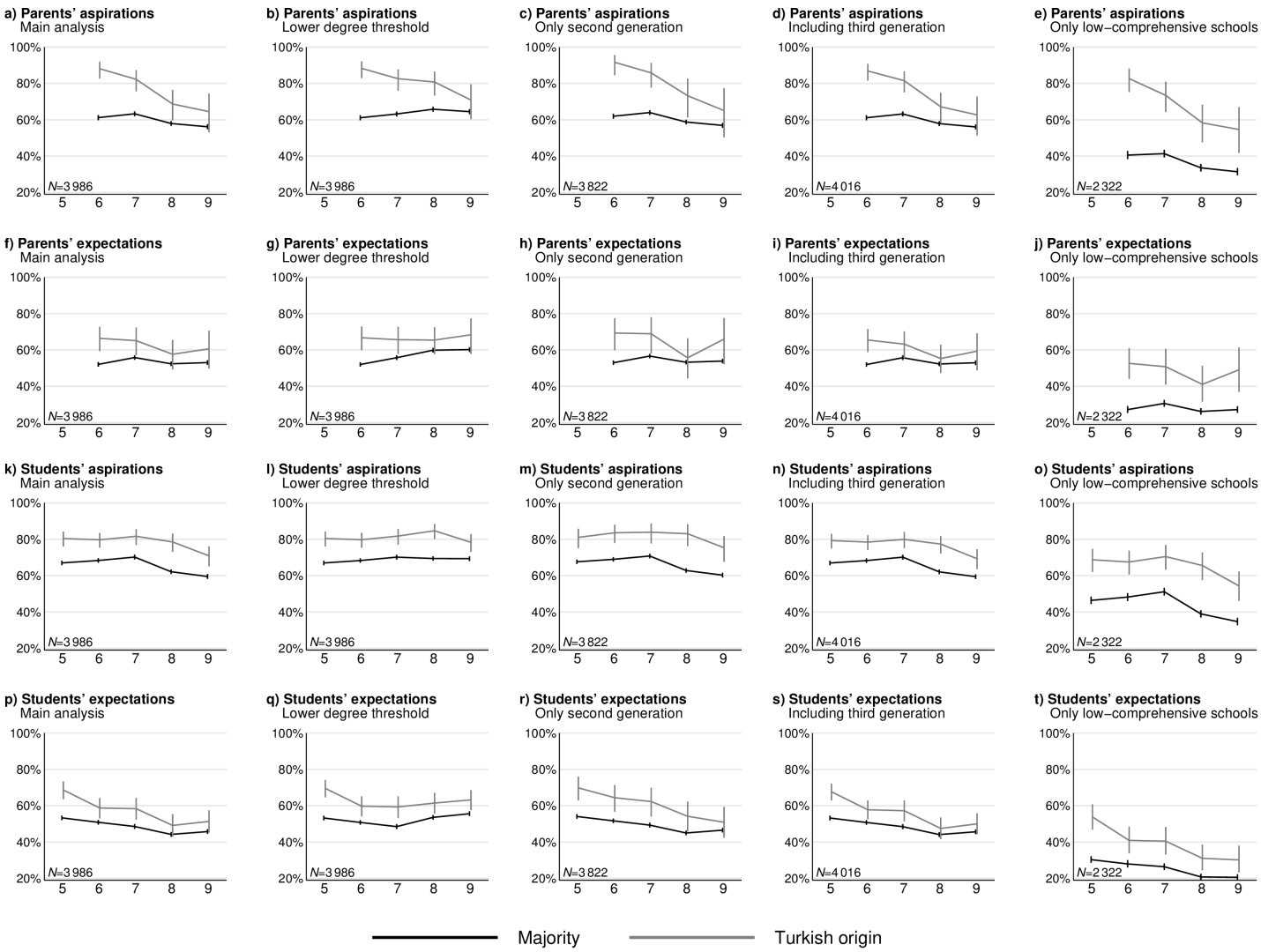

Figure A.2. Predicted probabilities of high aspirations and expectations for Turkish origin and majority students and parents: Robustness checks

Notes. Main analysis (see Figure 2) compared to analyses using different specifications. Predicted probabilities and 95% confidence intervals based on logistic regressions controlling for gender, parents' highest ISEI, parents' highest school degree, school type, and grade point average; including interactions of immigrant background with ISEI, school type, and grades.

Source. Own calculations based on NEPS-SC3.

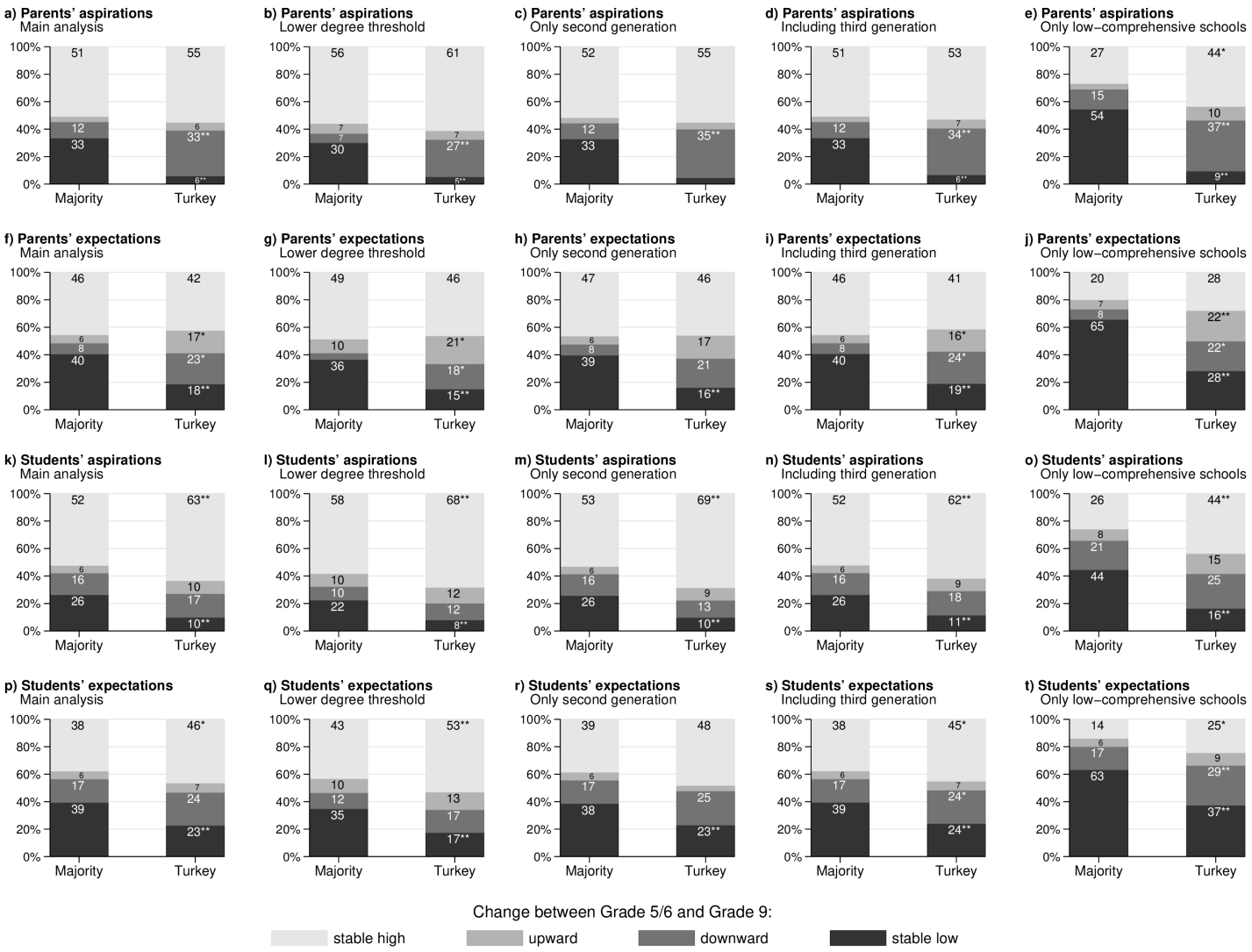

Figure A.3. Predicted patterns of aspirational and expectational trajectories: comparisons between 5th grade (6th grade for parents) and 9th grade: Robustness checks

Notes. Main analysis (see Figure 4) compared to analyses using different specifications. Predicted probabilities of patterns based on multinomial logistic regressions with controls (gender, parents' highest ISEI, parents' highest school degree, school type in first and last wave, and grade point average in first and last wave; including interactions of immigrant background with ISEI, school type, and grades.

Bar labels show percentages ≥5%. Significance levels of probability differences between Turkish origin and majority: * p<0.05 ** p<0.01.

Source. Own calculations based on NEPS-SC3.

Selectivity of complete and missing data

To analyse how complete data are associated with our central model variables (origin, achievement, school type, and aspirations), we ran linear probability models of full participation in all four to five waves vs. missing information on various factors measured in the first wave (year 5). We conducted this procedure separately for four sets of dependent variables (students' and parents' aspirations and expectations). To further account for potential differences in missing data generation processes in samples with missing values in wave 1, we ran each model with unimputed data (where cases with missing values in wave 1 were dropped) and imputed data (where missing data from wave 1 have been imputed). Table A.6 shows the results of the linear probability models. A coefficient of 0.01 indicates an increase of one percentage point in the probability of complete data in all waves.

The models indicate increased probabilities of complete data (positive coefficients) for

- students in intermediate- and upper-level secondary schools (difference of up to 15 percentage points compared to the low track);
- students with lower (=better) grades (up to 5 percentage points per grade level);
- students with a Turkish origin (up to 12 percentage points compared to majority students);
- students from high social background (for whom the effects on parents' participation seem stronger); and
- students with high degree expectations (up to 9 percentage points for complete data in models of student aspirations/expectations; effects of parent aspirations/expectations are not estimated because they were first collected in the second panel wave).

Therefore, restricting the analyses to complete cases would have left us with a highly selective group. Instead, we imputed missing data to achieve fully balanced panels of students and parents over the course of lower secondary education. As we imputed our data utilizing earlier and later measurements as well as a range of auxiliary variables while allowing for origin-specific missing data generation processes, we are confident that the conclusions drawn from imputed data are more generalizable than complete case analyses, which would be highly selective.

Table A.6. Linear probability models with complete data on central model variables measured in the first panel wave

Outcome: Complete vs. incomplete data for…	**Parents' aspirations**		**Parents' expectations**		**Students' aspirations**		**Students' expectations**	
Sample	**unimputed**	**imputed**	**unimputed**	**imputed**	**unimputed**	**imputed**	**unimputed**	**imputed**
School type (Ref.: Lower-level)								
Intermediate-level school ('Realschule')	.115***	.084***	.114**	.085***	.119**	.106***	.122***	.113***
	(.035)	(.022)	(.035)	(.022)	(.036)	(.023)	(.036)	(.023)
Comprehensive school	.021	.023	.023	.026	−.024	.009	−.032	.009
	(.040)	(.025)	(.040)	(.024)	(.042)	(.026)	(.042)	(.026)
Upper-level secondary school ('Gymnasium')	.118**	.117***	.107**	.117***	.100*	.149***	.079	.127***
	(.039)	(.025)	(.039)	(.025)	(.041)	(.027)	(.041)	(.026)
Grade German	−.013	−.019	−.012	−.017	−.029	−.030**	−.029	−.027**
	(.015)	(.010)	(.014)	(.010)	(.015)	(.011)	(.015)	(.011)
Grade math	−.054***	−.040***	−.052***	−.041***	−.032*	−.031***	−.036**	−.032***
	(.013)	(.009)	(.013)	(.009)	(.014)	(.009)	(.014)	(.009)
Immigrant background: Turkey (Ref.: Majority)	−.122*	−.106***	−.124*	−.105***	−.001	−.093**	.012	−.080**
	(.048)	(.027)	(.048)	(.027)	(.050)	(.029)	(.051)	(.029)
Gender: Male (Ref.: Female)	−.063**	−.046***	−.062**	−.044**	−.085***	−.056***	−.062**	−.033*
	(.020)	(.014)	(.020)	(.014)	(.021)	(.015)	(.021)	(.015)
Parents' highest ISEI (in units of 10 pt.)	.019**	.013**	.023***	.015***	.004	.004	.007	.007
	(.006)	(.004)	(.006)	(.004)	(.007)	(.005)	(.007)	(.005)
Parents' education: Intermediate (Ref.: Lower)	.098**	.059**	.098**	.056*	.076*	.044	.074	.047
	(.036)	(.023)	(.036)	(.023)	(.038)	(.025)	(.038)	(.025)
Upper secondary degree	.097*	.077**	.097*	.075**	.058	.039	.053	.037
	(.041)	(.026)	(.040)	(.026)	(.042)	(.029)	(.042)	(.028)
Students' aspirations	−.026	−.009	−.022	−.012	−.010	−.015	−.035	−.035
	(.035)	(.023)	(.035)	(.023)	(.036)	(.024)	(.037)	(.024)
Students' expectations	.016	.018	.014	.019	.066*	.059*	.085*	.071**
	(.032)	(.022)	(.032)	(.022)	(.034)	(.023)	(.034)	(.022)
Intercept	.313***	.234***	.284***	.222***	.548***	.346***	.532***	.310***
	(.061)	(.039)	(.061)	(.039)	(.064)	(.042)	(.064)	(.042)
N	2267	3986	2267	3986	2267	3986	2267	3986
R^2	.066		.066		.045		.040	

Notes. Positive values indicate positive effects on probabilities of complete data. Source. * $p<0.05$, ** $p<0.01$, *** $p<0.001$. Source. Own calculations based on NEPS-SC3.