

Supplement to:

Baier, Tina, and Volker Lang. 2019. “The Social Stratification of Environmental and Genetic Influences on Education: New Evidence Using a Register-Based Twin Sample.” *Sociological Science* 6: 143-171.

**Supplementary Material**

Table S1. Coding scheme for years of education

Level of education	Years of education
<b>general education</b>	
no diploma	7
lower secondary ( <i>Hauptschulabschluss</i> )	9
intermediate secondary ( <i>Realschulabschluss</i> )	10
diploma to enter a professional college ( <i>Fachhochschulreife</i> )	12
upper secondary ( <i>Abitur</i> )	13
other general educational	10
<b>+ occupational training</b>	
apprenticeship	1.5
technical schools (including health-care schools)	2
civil servants' apprenticeship	1.5
higher technical college	3
university degree	5
Ph.D. (coded only for parents of twins)	7

Table S2. ACE-variance decompositions for twins' years of education by parents' years of education<sup>a</sup>

	Lower bound scenario			Upper bound scenario		
	b/var	c.s.e.	z	b/var	c.s.e.	z
<b>Parents' years of education</b>						
<b>≥ 7 to ≤ 11</b>						
Constant	-1.32	0.16	-8.4***	-0.35	0.23	-1.51
Total variance	4.05	0.45	8.94***	8.11	0.73	11.09***
A in %	39.90	21.87	1.82	40.42	18.23	2.22*
C in %	32.85	19.74	1.66	43.52	18.01	2.42**
E in %	27.25	7.44	3.66***	16.06	4.34	3.70***
N <sub>twin pairs</sub>	160			160		
<b>≥ 9 to ≤ 12</b>						
Constant	-0.69	0.1	-6.74***	0.44	0.14	3.18**
Total variance	4.87	0.36	13.37***	8.56	0.4	21.33***
A in %	24.15	14.35	1.68	37.94	10.66	3.56***
C in %	44.16	13.58	3.25**	42.93	10.45	4.11***
E in %	31.69	4.51	7.03***	19.13	2.72	7.03***
N <sub>twin pairs</sub>	434			434		
<b>≥ 10 to ≤ 13</b>						
Constant	-0.58	0.1	-5.84***	0.60	0.13	4.47***
Total variance	4.76	0.36	13.34***	8.44	0.38	21.93***
A in %	27.34	14.67	1.86	41.12	11.03	3.73***
C in %	40.45	13.82	2.93**	39.49	10.75	3.67***
E in %	32.21	4.58	7.04***	19.39	2.83	6.86***
N <sub>twin pairs</sub>	443			443		
<b>≥ 11 to ≤ 14</b>						
Constant	-0.32	0.1	-3.07**	0.94	0.14	6.55***
Total variance	4.75	0.36	13.06***	8.14	0.37	21.9***
A in %	35.49	15.86	2.24*	44.44	12.12	3.67***
C in %	29.28	13.89	2.11*	33.47	11.54	2.90**
E in %	35.23	5.35	6.58***	22.09	3.37	6.55***
N <sub>twin pairs</sub>	399			399		
<b>≥ 12 to ≤ 15</b>						
Constant	0.06	0.11	0.52	1.50	0.15	10.1***
Total variance	4.40	0.35	12.55***	7.29	0.36	20.39***
A in %	61.83	18.96	3.26***	37.11	16.33	2.27*
C in %	2.79	16.81	0.17	28.63	14.41	1.99*
E in %	35.37	5.37	6.59***	34.26	4.96	6.90***
N <sub>twin pairs</sub>	331			331		
<b>≥ 13 to ≤ 16</b>						
Constant	0.10	0.11	0.88	1.58	0.15	10.34***
Total variance	4.47	0.38	11.9***	7.39	0.41	17.89***
A in %	55.87	19.79	2.82**	42.59	16.5	2.58**
C in %	5.53	16.69	0.33	26.62	14.58	1.83
E in %	38.60	6.26	6.17***	30.79	5.14	5.99***
N <sub>twin pairs</sub>	309			309		

<b>≥ 14 to ≤ 17</b>						
Constant	0.17	0.12	1.34	1.71	0.17	9.99***
Total variance	4.48	0.42	10.63***	7.43	0.45	16.66***
A in %	40.22	23.93	1.68	34.32	19.08	1.80
C in %	18.97	21.24	0.89	32.55	16.61	1.96*
E in %	40.81	6.8	6.00***	33.13	5.99	5.53***
N <sub>twin pairs</sub>	247			247		
<b>≥ 15 to ≤ 18</b>						
Constant	0.53	0.12	4.62***	2.47	0.15	16.7***
Total variance	5.02	0.37	13.48***	7.30	0.46	15.95***
A in %	46.36	19.16	2.42*	51.77	16.73	3.09***
C in %	17.38	16.68	1.04	23.41	15.18	1.54
E in %	36.26	5.76	6.30***	24.82	4.42	5.61***
N <sub>twin pairs</sub>	326			326		
<b>≥ 16 to ≤ 19</b>						
Constant	0.63	0.14	4.5***	2.72	0.18	15.42***
Total variance	5.16	0.44	11.83***	7.23	0.59	12.15***
A in %	64.83	9.75	6.65***	69.55	19.45	3.58***
C in %	---	---	---	12.34	18.29	0.67
E in %	35.17	6.52	5.39	18.11	4.26	4.26***
N <sub>twin pairs</sub>	231			231		
<b>≥ 17 to ≤ 20</b>						
Constant	0.93	0.15	6.02***	3.14	0.18	17.59***
Total variance	5.41	0.44	12.31***	6.24	0.67	9.31***
A in %	70.25	9.94	7.07***	79.60	10.49	7.59***
C in %	---	---	---	---	---	---
E in %	29.75	6.61	4.50***	20.40	5.15	3.96***
N <sub>twin pairs</sub>	209			209		

<sup>a</sup> Clustered standard errors are calculated at the twin pair level. Legend: \*:  $P(Z > |z|) < .05$ ; \*\*:  $P(Z > |z|) < .01$ ; \*\*\*:  $P(Z > |z|) < .001$  (two-tailed tests). Source: TwinLife wave 1; own calculations.

Table S3. ACE-variance decompositions for twins' years of education<sup>a</sup> – without imputation

	Lower bound scenario			Upper bound scenario		
	b/var	c.s.e.	z	b/var	c.s.e.	z
<b>Base model:</b>						
Assumed genetic DZ correlation	0.50			0.50		
Constant	-0.10	0.07	-1.53	1.38	0.09	15.59***
Total variance	5.26	0.23	23.00***	8.84	0.23	38.91***
A in %	43.57	7.97	5.47***	41.00	6.52	6.29***
C in %	26.59	7.14	3.73***	39.73	6.21	6.40***
E in %	30.32	2.64	11.47***	19.72	1.78	11.09***
<b>Model 1 (Parents' education):</b>						
Assumed genetic DZ correlation	0.50			0.50		
Parents' years of education	0.26	0.02	12.86***	0.41	0.02	16.50***
Constant	-0.17	0.06	-2.72**	1.28	0.08	15.82***
Total variance	5.27	0.23	22.99***	8.85	0.23	38.80***
A in %	43.06	7.74	5.19***	41.58	6.72	6.19***
C in %	15.17	6.88	2.20*	21.90	6.24	3.51***
E in %	30.42	2.63	11.55***	19.72	1.78	11.09***
Explained variance (R <sup>2</sup> ) in %	11.35			16.81		
<b>Model 2 (Assortative mating):</b>						
Assumed genetic DZ correlation	0.62			0.62		
Parents' years of education	0.26	0.02	12.86***	0.41	0.02	16.50***
Constant	-0.17	0.06	-2.72**	1.28	0.08	15.82***
Total variance	5.27	0.23	22.99***	8.85	0.23	38.80***
A in %	56.53	10.10	5.59***	54.59	8.81	6.20***
C in %	1.71	9.02	0.19	8.89	8.15	1.09
E in %	30.42	2.63	11.58***	19.72	1.78	11.09***
Explained variance (R <sup>2</sup> ) in %	11.35			16.81		
<b>Model 3 (Sibling effects):</b>						
Assumed genetic DZ correlation	0.62			0.62		
Parents' years of education	0.26	0.02	12.96***	0.41	0.02	16.60***
Closeness of twins	0.25	0.05	4.93***	0.29	0.07	4.32***
Constant	-0.16	0.06	-2.76**	1.29	0.08	16.12***
Total variance	5.27	0.23	22.99***	8.85	0.23	38.80***
A in %	55.82	4.04	13.83***	56.47	8.81	6.41***
C in %	---	---	---	5.38	8.14	0.66
E in %	30.81	2.50	12.35***	19.61	1.78	11.02***
Explained variance (R <sup>2</sup> ) in %	13.36			18.54		

<sup>a</sup> All models besides the base model (N = 965) are based on N = 962 twin pairs and clustered standard errors are calculated at the twin pair level. Legend: \*:  $P(Z > |z|) < .05$ ; \*\*:  $P(Z > |z|) < .01$ ; \*\*\*:  $P(Z > |z|) < .001$  (two-tailed tests). Source: TwinLife wave 1; own calculations.

Table S4. ACE-variance decompositions for twins' years of education by parents' years of education<sup>a</sup> – without imputation

	Lower bound scenario			Upper bound scenario		
	b/var	c.s.e.	z	b/var	c.s.e.	z
<b>Parents' years of education:</b>						
<b>≥ 7 to ≤ 11</b>						
Constant	-1.26	0.12	-10.45***	-0.30	0.18	-1.70
Total variance	3.98	0.35	11.35***	8.07	0.56	14.45***
A in %	33.49	18.86	1.78	40.08	15.64	2.56**
C in %	33.37	16.40	2.03*	41.16	15.31	2.69**
E in %	33.14	6.94	4.78***	18.76	3.46	5.42***
N <sub>twin pairs</sub>	219			219		
<b>≥ 9 to ≤ 12</b>						
Constant	-0.61	0.09	-6.61***	0.52	0.12	4.23***
Total variance	4.93	0.32	15.25***	8.57	0.35	24.49***
A in %	23.04	12.79	1.80	38.01	9.74	3.90***
C in %	45.35	12.08	3.76***	42.38	9.42	4.50***
E in %	31.61	4.01	7.88***	19.60	2.52	7.79***
N <sub>twin pairs</sub>	484			484		
<b>≥ 10 to ≤ 13</b>						
Constant	-0.45	0.09	-4.96***	0.76	0.12	6.20***
Total variance	4.81	0.32	15.14***	8.41	0.34	25.00***
A in %	27.39	13.57	2.02*	43.32	10.24	4.23***
C in %	40.03	12.55	3.19***	36.85	9.84	3.74***
E in %	32.59	4.25	7.67***	19.84	2.64	7.51***
N <sub>twin pairs</sub>	474			474		
<b>≥ 11 to ≤ 14</b>						
Constant	-0.17	0.10	-1.78	1.13	0.13	8.76***
Total variance	4.88	0.34	14.35***	8.05	0.34	23.75***
A in %	41.34	15.38	2.69**	46.63	11.66	4.00***
C in %	25.02	13.55	1.85	30.81	10.84	2.84**
E in %	33.64	45.76	7.35***	22.56	3.14	7.18***
N <sub>twin pairs</sub>	400			400		
<b>≥ 12 to ≤ 15</b>						
Constant	0.19	0.10	1.89	1.68	0.13	12.95***
Total variance	4.32	0.30	14.26***	6.94	0.29	23.92***
A in %	63.17	7.92	7.97***	37.05	16.36	2.26*
C in %	---	---	---	25.88	14.01	1.85
E in %	36.83	4.83	7.63***	37.08	5.14	7.21***
N <sub>twin pairs</sub>	316			316		
<b>≥ 13 to ≤ 16</b>						
Constant	0.20	0.11	1.89	1.74	0.14	12.37***
Total variance	4.40	0.33	13.26***	7.08	0.34	20.67***
A in %	57.92	8.47	6.84***	43.94	16.81	2.61**
C in %	---	---	---	22.36	14.34	1.56
E in %	42.08	5.68	7.41***	33.70	5.31	6.35***
N <sub>twin pairs</sub>	275			275		

<b>≥ 14 to ≤ 17</b>						
Constant	0.27	0.12	2.22*	1.88	0.16	11.74***
Total variance	4.38	0.38	11.66***	7.11	0.38	18.71***
A in %	38.64	23.00	1.68	33.84	19.85	1.70
C in %	15.39	19.91	0.77	29.03	16.97	1.71
E in %	45.97	6.96	6.60***	37.13	62.93	5.90***
N <sub>twin pairs</sub>	215			215		
<b>≥ 15 to ≤ 18</b>						
Constant	0.67	0.11	5.84***	2.74	0.14	20.03***
Total variance	4.92	0.36	13.65***	6.60	0.43	15.23***
A in %	44.10	19.88	2.22*	58.96	17.95	3.28***
C in %	16.46	16.91	0.97	14.46	16.34	0.89
E in %	39.44	6.10	6.47***	26.58	4.51	5.90***
N <sub>twin pairs</sub>	279			279		
<b>≥ 16 to ≤ 19</b>						
Constant	0.78	0.14	5.67***	3.05	0.16	18.80***
Total variance	5.06	0.43	11.74***	6.39	0.58	11.02***
A in %	61.65	24.87	2.48**	82.43	10.06	8.19***
C in %	0.34	20.28	0.02	---	---	---
E in %	38.01	7.62	4.99***	17.57	4.10	4.29***
N <sub>twin pairs</sub>	194			169		
<b>≥ 17 to ≤ 20</b>						
Constant	1.09	0.15	7.26***	3.48	0.15	22.88***
Total variance	5.29	0.42	12.54***	5.30	0.62	8.61***
A in %	70.43	10.42	6.76***	78.39	12.88	6.09***
C in %	---	---	---	---	---	---
E in %	29.57	6.84	4.32***	21.61	5.39	4.01***
N <sub>twin pairs</sub>	175			175		

<sup>a</sup> Clustered standard errors are calculated at the twin pair level. Legend: \*:  $P(Z > |z|) < .05$ ; \*\*:  $P(Z > |z|) < .01$ ; \*\*\*:  $P(Z > |z|) < .001$  (two-tailed tests). *Source*: TwinLife wave 1; own calculations.