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Supplementary material

Appendix 1

Table A1: Full results of models testing for correlations between individual standardized heterozygosity and fitness variables. Brood size and hatch order are categorical variables, such that values refer to the comparison of 2- and 3-chick (in one case, 4-chick) broods to 1-chick broods and of second- and third-hatched chicks to first-hatched chicks, respectively.

Response Variable	*n*	Fixed Effect	β	SE	*t*
At fledging:					
Fledging probability	806	Standardized Heterozygosity	-5.17	3.61	-1.43
		Standardized Heterozygosity^2	-0.887	1.61	-0.550
		Brood Size:			
		2 chicks	0.479	1.90	0.250
		3 chicks	1.49	2.63	0.570
		4 chicks	-8.61	13.99	-0.620
		Hatch Order:			
		second chick	-1.69	0.936	-1.81
		third chick	-2.43	1.72	-1.42
		Proportional Laydate	-6.73	3.48	-1.93
		Intercept	14.03	2.94	4.77
		σ^2_{Cohort} =171.8			
Bill length	750	Standardized Heterozygosity	0.101	0.139	0.728

		Standardized Heterozygosity^2	0.307	0.404	0.760
		Brood Size:			
		2 chicks	-0.0288	0.0931	-0.309
		3 chicks	-0.119	0.123	-0.966
		Hatch Order:			
		second chick	-0.212	0.0846	-2.50
		third chick	-0.502	0.202	-2.49
		Proportional Laydate	0.0988	0.161	0.614
		Intercept	0.0733	0.112	0.654
		σ^2_{Cohort} =0.0543			
Ulna length	748	Standardized Heterozygosity	0.115581	0.115691	0.999
		Standardized Heterozygosity^2	-0.235069	0.335621	-0.700
		Brood Size:			
		2 chicks	-0.07278	.077533	-0.939
		3 chicks	-0.039314	0.102643	-0.383
		Hatch Order:			
		second chick	0.008182	0.070111	0.117
		third chick	-0.100057	0.167080	-0.599
		Proportional Laydate	-0.088134	0.134639	-0.655
		Intercept	0.217156	0.119819	1.812
		σ^2_{Cohort} = 0.1311			

Body mass	698	Standardized Heterozygosity	-0.00552	0.113	-0.049
		Standardized Heterozygosity^2	-0.104	0.329	-0.316
		Brood Size:			
		2 chicks	-0.0187	0.0755	-0.247
		3 chicks	0.00500	0.0995	0.050
		Hatch Order:			
		second chick	-0.189	0.0682	-2.77
		third chick	-0.635	0.164	-3.86
		Proportional Laydate	-0.576	0.131	-4.40
		Intercept	0.137	0.162	0.847
		σ^2_{Cohort} =0.277			
As adults:					
Bill length	642	Standardized Heterozygosity	0.134	0.151	0.889
		Standardized Heterozygosity^2	-0.114	0.455	-0.250
		Age	7.30×10^{-5}	0.0150	0.005
		Intercept	-2.98×10^{-5}	0.169	0.000
		σ^2_{Cohort} = 0.0504			
Ulna length	642	Standardized Heterozygosity	0.106	0.151	0.703
		Standardized Heterozygosity^2	-0.111	0.456	-0.244
		Age	0.00426	0.0146	0.291
		Intercept	-0.0153	0.164	-0.093

		σ^2_{Cohort} =0.0456			
Body mass	639	Standardized Heterozygosity	0.240	0.153	1.57
		Standardized Heterozygosity^2	-0.176	0.463	-0.379
		Age	0.0110	0.0458	0.240
		Age^2	-4.20×10^{-4}	0.00220	-0.190
		Intercept	-0.0278	0.210	-0.132
		σ^2_{Cohort} = 0.0132			
Foot color	124	Standardized Heterozygosity	-0.0148	0.288	-0.0510
		Standardized Heterozygosity^2	-0.757	0.833	-0.909
		Age	-0.0175	0.0740	-0.236
		Age^2	-0.00135	0.00355	-0.381
		Intercept	0.301	0.346	0.868
		σ^2_{Cohort} = 0.0031			
Mean breeding success	749	Standardized Heterozygosity	0.0953	0.0838	1.14
		Standardized Heterozygosity^2	0.212	0.245	0.868
		Age	-0.00230	0.00947	-0.316
		Age^2	-1.33×10^{-5}	0.00114	-0.012
		Intercept	0.342	0.0358	9.55
		σ^2_{Cohort} = 0.00204			

Table A2: Full results of models testing for correlations between individual Md^2 and fitness variables. Brood size and hatch order are categorical variables, such that values refer to the comparison of 2- and 3-chick (and in one case, 4-chick) broods to 1-chick broods and of second- and third-hatched chicks to first-hatched chicks, respectively.

Response Variable	*n*	Fixed Effect	β	SE	*t*
At fledging:					
Fledging probability	806	Linear Md^2	0.079	0.400	0.200
		Quadratic Md^2	0.206	0.320	0.640
		Brood Size:			
		2 chicks	0.257	1.80	0.140
		3 chicks	1.29	2.50	0.520
		4 chicks	-8.04	13.5	-0.600
		Hatch Order:			
		second chick	-1.64	0.897	-1.82
		third chick	-2.15	1.68	-1.28
		Proportional Laydate	-6.67	3.32	-2.01
		Intercept	13.1	2.72	4.81
		$\sigma^2_{Cohort} = 176.6$			
Bill length	750	Linear Md^2	0.0364	0.0256	1.42
		Quadratic Md^2	-0.0517	0.0185	-2.79
		Brood Size:			
		2 chicks	-0.0309	0.0926	-0.334

		3 chicks	-0.116	0.122	-0.945
		Hatch Order:			
		second chick	-0.211	0.0841	-2.51
		third chick	-0.486	0.200	-2.43
		Proportional Laydate	0.0714	0.160	0.447
		Intercept	0.198	0.114	1.73
		σ^2_{Cohort} =0.0519			
Ulna length	748	Linear Md^2	0.0319	0.0213	1.50
		Quadratic Md^2	-0.0418	0.0154	-2.72
		Brood Size:			
		2 chicks	-0.0741	0.0771	-0.962
		3 chicks	-0.0464	0.102	-0.454
		Hatch Order:			
		second chick	0.0118	0.0697	0.169
		third chick	-0.0798	0.166	-0.480
		Proportional Laydate	-0.107	0.134	-0.802
		Intercept	0.290	0.123	2.35
		σ^2_{Cohort} = 0.136			
Body mass	698	Linear Md^2	0.00517	0.0209	0.248
		Quadratic Md^2	-0.0283	0.0154	-1.84
		Brood Size:			

		2 chicks	-0.0211	0.0753	-0.280
		3 chicks	0.00355	0.0992	0.0360
		Hatch Order:			
		second chick	-0.184	0.0680	-2.71
		third chick	-0.636	0.163	-3.89
		Proportional Laydate	-0.581	0.130	-4.45
		Intercept	0.197	0.165	1.20
		$\sigma^2_{Cohort} = 0.280$			
As adults:					
Bill length	642	Linear Md^2	-0.0189	0.0273	-0.692
		Quadratic Md^2	0.00960	0.0199	0.484
		Age	0.000719	0.0150	0.048
		Intercept	-0.0317	0.173	-0.184
		$\sigma^2_{Cohort} = 0.05105$			
Ulna length	642	Linear Md^2	-0.00379	0.0274	-0.138
		Quadratic Md^2	-0.00218	0.0199	-0.109
		Age	0.00459	0.0146	0.314
		Intercept	-0.0226	0.167	-0.135
		$\sigma^2_{Cohort} = 0.0457$			
Body mass	639	Linear Md^2	0.0229	0.0279	0.821

		Quadratic Md^2	-0.00250	0.0202	-0.124
		Age	0.00669	0.0457	0.146
		Age^2	-0.000201	0.00220	-0.091
		Intercept	-0.0314	0.213	-0.148
		$\sigma^2_{Cohort} = 0.01294$			
Foot color	124	Linear Md^2	-0.0453	0.0543	-0.834
		Quadratic Md^2	-0.0479	0.0383	-1.25
		Age	-0.00808	0.0742	-0.109
		Age^2	-0.00169	0.00355	-0.474
		Intercept	0.297	0.348	0.852
		$\sigma^2_{Cohort} = 0.00158$			
Mean breeding success	749	Linear Md^2	0.00886	0.0155	0.572
		Quadratic Md^2	0.00353	0.0112	0.314
		Age	-0.00347	0.00948	-0.365
		Age^2	6.50×10^{-5}	0.00114	0.0570
		Intercept	0.343	0.0393	8.71
		$\sigma^2_{Cohort} = 0.00205$			

Table A3: Full results of models testing the effect of social male standardized heterozygosity (SH) on probability of extra-pair (EP) behaviors and paternity.

Response Variable	*n* (no/yes)	Fixed Effect	β	SE	*Z*
EP Courtship Probability:	92 (73/19)	Social male SH	0.716	0.998	0.717
		Social male SH^2	-1.73	3.10	-0.559
		Intercept	-1.21	0.333	-3.62
		$\sigma^2_{Year} = 0.00$			
EP Copulation Probability:	19 (11/8)	Social male SH	1.45	2.07	0.701
		Social male SH^2	-2.02	5.95	-0.339
		Intercept	-0.227	0.572	-0.397
		$\sigma^2_{Year} = 0.00$			
EP Paternity Probability:	384 (341/43)	Social male SH	-0.0335	0.567	-0.059
		Social male SH^2	0.839	1.69	0.496
		Intercept	-2.073	0.202	-10.3
		(no random effects)			

Table A4: Full results of models testing the effect of the interaction of female and social male standardized heterozygosity (SH) on probability of extra-pair (EP) behaviors and paternity.

Response Variable	*n* (no/yes)	Fixed Effect	β	SE	*Z*
EP Courtship Probability:	54 (42/12)	Female SH	4.51	6.10	0.741
		Social male SH	6.82	6.18	1.10
		Female * Social male SH	-3.83	6.15	-0.623
		Intercept	-8.69	6.29	-1.380
		$\sigma^2_{Year} = 0.00$			
EP Paternity Probability:	384 (341/43)	Female SH	-0.129	2.60	-0.0500
		Social male SH	0.197	2.49	0.0790
		Female * Social male SH	-0.371	2.53	-0.147
		Intercept	-1.79	2.56	-0.698
		(no random effects)			

Table A5: Full results of models testing the effect of social male Md^2 on probability of extra-pair (EP) behaviors and paternity.

Response Variable	*n* (no/yes)	Fixed Effect	β	SE	*Z*
EP Courtship Probability:	92 (73/19)	Linear Social male Md^2	-0.0984	0.192	-0.511
		Quadratic Social male Md^2	-0.149	0.143	-1.04
		Intercept	-1.01	0.376	-2.69
		$\sigma^2_{Year} = 0.00$			
EP Copulation Probability:	19 (11/8)	Linear Social male Md^2	-1.93×10^{-3}	0.363	-5.00×10^{-3}
		Quadratic Social male Md^2	-0.152	0.339	-0.450
		Intercept	-0.0496	0.745	-0.0670
		$\sigma^2_{Year} = 0.00$			
EP Paternity Probability:	384 (341/43)	Linear Social male Md^2	0.0456	0.142	0.322
		Quadratic Social male Md^2	-0.240	0.109	-2.22
		Intercept	-1.63	0.215	-7.55
		(no random effects)			

Table A6: Full results of models testing the effect of the interaction of female and social male Md^2 on probability of extra-pair (EP) behaviors and paternity.

Response Variable	*n* (no/yes)	Fixed Effect	β	SE	*Z*
EP Courtship Probability:	54 (42/12)	Female Md^2	-0.371	0.859	-0.432
		Social male Md^2	-0.992	1.05	-0.945
		Female * Social male Md^2	0.163	0.208	0.783
		Intercept	1.39	4.20	0.331
		$\sigma^2_{Year} = 0.00$			
EP Paternity Probability:	384 (341/43)	Female Md^2	-0.0741	0.429	-0.173
		Social male Md^2	-0.196	0.446	-0.439
		Female * Social male Md^2	0.0387	0.0869	0.445
		Intercept	-1.68	2.19	-0.770
		(no random effects)			

Table A7: Full results of models testing the effect of the pairwise relatedness of the female and her social male on the probability of extra-pair (EP) behaviors and paternity.

Response Variable	*n* (no/yes)	Fixed Effect	β	SE	*Z*
EP Courtship Probability:	54 (42/12)	Relatedness	-21.2	13.60	-1.56
		Relatedness^2	30.4	32.3	0.941
		Intercept	-0.675	0.382	-1.77
		$\sigma^2_{Year} = 2.78 \times 10^{-16}$			
EP Paternity Probability:	384 (341/43)	Relatedness	4.69	3.52	-1.33
		Relatedness^2	8.95	8.00	1.12
		Intercept	1.88	0.205	-9.20
		(no random effects)			