## L. Koníková, M. Králík, O. Klíma, M. Čuta

## **SUPPLEMENTARY MATERIALS**

	Ľ.		ıte e	ize iff.	S					Distan	ces bet	ween pa	rtners				
Spearman	correlation	Sex	Age absolute difference	Centroid size absolute diff.	Procrustes Distance	PC1	PC2	PC3	PC4	PC5	PC6	PC8	PC9	PC10	PC12	PC13	PC14
		М	010	110	030	030	.090	100	.030	.130	030	210*	130	.060	.090	130	.040
	phase	101	.954	.311	.802	.761	.416	.358	.800	.227	.808	.046	.212	.569	.427	.211	.700
	h	F	.040	.210*	090	020	.050	080	.120	060	140	030	090	.080	100	040	010
FPC1		Ľ	.691	.036	.403	.811	.601	.423	.244	.594	.165	.788	.366	.415	.338	.728	.913
"	lde	м	090	190	.040	.000	.070	120	.160	210*	.070	.040	.100	120	130	.260*	030
	lit u		.383	.077	.712	.997	.494	.266	.125	.047	.517	.679	.363	.256	.232	.015	.749
	amplitude	F	.040	320**	.000	050	090	110	.070	.170	.130	.070	030	.110	.250*	.140	.120
-	а		.715	.002	.969	.612	.386	.290	.512	.091	.211	.521	.751	.271	.013	.173	.253
	phase	М	.010	.150	.100	020	040	.180	.060	.210*	100	.080	070	.110	.030	150	.070
			.929	.166	.359	.826	.741	.094	.572	.046	.355	.466	.520	.320	.754	.177	.508
	ם	F	.020	.080	040	.070	.010	.030	030	030	010	060	020	060	130	.020	380**
FPC2			.822	.461	.680	.523	.949	.806	.736	.799	.923	.557	.856	.574	.198	.849	.000
=	pr	М	.030	130	070	.130	010	210	130	040	.030	080	.030	080	.080	.050	030
	<u>ਜ਼</u>	<u> </u>	.775	.211	.520	.211	.932	.052	.214	.703	.777	.475	.797	.450	.486	.633	.777
	amplitude	F	.000	060	.020	.000	020	.050	180	090	.040	.020	010	060	.110	070	.250*
-	ю		.998	.564	.833	.978	.882	.596	.082	.375	.685	.850	.930	.563	.273	.477	.016
	به	М	010 .960	130 .245	120 .268	.030 .779	150 .176	240* .026	070 .545	010 .914	.040 .716	.060 .562	.170 .123	.060 .590	.010 .958	.050 .670	030 .785
	phase		100	.000	100	080	.040	290**	.170	.030	130	.362 160	010	020	.958	.120	.765
۳ ا	ď	F	.314	.988	.350	.424	.678	.005	.090	.798	.193	.123	.894	.820	.933	.237	.492
FPC3	(I)		.080	110	.070	120	.120	.030	.100	.090	.090	050	190	090	200	020	.060
1 "	pn	М	.433	.313	.515	.279	.265	.756	.363	.395	.391	.630	.075	.389	.062	.850	.565
	amplitude	$\vdash$	050	.070	.060	.110	.050	.070	.090	.060	.070	.050	130	.190	070	140	070
	am	F	.653	.477	.558	.292	.619	.474	.395	.551	.522	.611	.224	.064	.519	.185	.516
<u> </u>			.055	.4//	.550	.232	.013	.4/4	.555	.551	.522	.011	.224	.004	.513	.103	.510

Table S1: Table of Spearman's correlation coefficients and p-values between parental variables (age absolute difference, face centroid size absolute difference, Procrustes distance and Principal Component distances between partners) and descriptors of the growth curves of their offspring (Functional Principal Components 1–3 phase and amplitude).
\*\*. Correlation is significant at the 0.01 level.

	_							Abs	olute di	fference	es betwe	en parti	ners					
Spearman	Spearman correlation		Height	Weight	Head circumf.	Head width	Head length	Head	Ft - ft	Zy - zy	Go - go	PFL	MFL	Nose to chin	Nose width	Nose height	Mouth width	Mouth height
		М	130	060	030	010	.160	140	.050	.100	100	030	030	270*	140	.080	.040	.180
1	phase	IVI	.230	.549	.776	.899	.147	.200	.653	.352	.352	.765	.760	.012	.203	.460	.730	.091
1	ph	F	.160	080	.100	.140	170	060	040	120	.090	.070	.150	.200	010	060	010	020
FPC1		'	.131	.450	.332	.177	.095	.530	.718	.229	.381	.484	.158	.053	.898	.580	.898	.821
윤	ge	М	.020	070	020	090	.100	.170	060	070	.150	.090	.060	.200	.050	.000	080	.210*
1	iţ	101	.870	.508	.885	.405	.356	.119	.576	.529	.157	.413	.589	.059	.628	.974	.454	.050
1	amplitude	F	100	.200*	100	.140	.170	.070	.330**	.230*	.040	120	190	120	140	.110	040	.100
	ar		.330	.050	.324	.176	.106	.495	.001	.021	.687	.230	.057	.247	.177	.297	.727	.317
1	phase	м	.000	.000	030	.080	030	.020	.090	.060	300**	.030	020	060	050	.040	.130	.020
1			.997	.968	.808	.466	.760	.880	.408	.566	.005	.795	.850	.599	.619	.741	.219	.883
1	μþ	4	140	.020	100	040	.140	110	020	.060	270**	060	160	140	.190	060	100	.010
FPC2			.184	.821	.345	.723	.166	.304	.852	.541	.007	.580	.111	.168	.059	.590	.341	.935
1 12	ge	М	010	090	.000	030	020	220*	060	.040	.230*	.000	020	180	.080	010	110	090
1	amplitude		.914	.381	.998	.782	.864	.038	.580	.695	.032	.971	.831	.093	.462	.936	.327	.380
1	ημ	F	.110	060	.130	110	100	.070	180	160	.210*	.010	.140	.080	090	030	.040	050
	ā		.272	.577	.207	.271	.339	.473	.086	.116	.044	.910	.177	.467	.391	.784	.729	.655
1	ا ا	м	090	130	.190	210	.100	110	.160	.030	.110	.060	050	120	.050	.180	.100	.000
1	phase		.403	.218	.083	.053	.351	.318	.141	.794	.327	.548	.645	.276	.647	.092	.367	.983
١.	р	F	.150	.040	.080	.060	.120	.080	030	020	.070	.090	.050	.070	130	.040	.060	130
FPC3			.148	.670	.451	.539	.248	.425	.743	.871	.490	.410	.653	.468	.194	.679	.590	.211
#	ge	М	.010	010	090	.030	.120	.110	120	.070	190	050	060	090	130	210	.020	.170
1	E		.946	.921	.412	.761	.276	.312	.246	.526	.071	.650	.598	.390	.231	.054	.888	.113
1	amplitude	F	.090	.070	.040	.110	170	070	.140	.160	.090	140	.010	.020	030	.020	020	.050
	ซิ		.367	.513	.729	.275	.097	.512	.186	.111	.396	.190	.961	.884	.751	.837	.827	.596

Table S2: Table of Spearman's correlation coefficients and p-values between parental variables (absolute differences in anthropometric measurements between partners) and descriptors of the growth curves of their offspring (Functional Principal Components 1–3 phase and amplitude).

\*\*. Correlation is significant at the 0.01 level.

\*. Correlation is significant at the 0.05 level.

<sup>\*.</sup> Correlation is significant at the 0.05 level.

Spearman	correlation	Sex	Age	Birth order	Number of siblings	Centroid Size	PC1 score	PC2 score	PC3 score	PC4 score	PC5 score	PC6 score	PC8 score	PC9 score	PC10 score	PC12 score	PC13 score	PC14 score
		М	120	.000	.030	020	210	140	160	040	.050	140	.180	.130	170	050	090	.090
	phase		.255	.978	.772	.848	.052	.207	.135	.697	.634	.204	.095	.227	.104	.664	.410	.411
	ph	F	.230*	050	080	010	170	150	180	070	070	060	020	120	.080	.010	040	060
FPC1		Ŀ	.023	.607	.433	.892	.104	.132	.077	.529	.514	.547	.879	.235	.420	.909	.724	.544
1 12	de	м	.210*	180	050	.150	.140	.140	.070	.040	.070	.120	160	.050	.040	140	.240*	.120
	litu		.046	.089	.636	.158	.196	.182	.501	.744	.540	.274	.125	.646	.732	.182	.025	.270
	amplitude	F	120	030	100	.020	.040	.010	.120	200*	060	100	.000	.080	090	020	.030	.310**
	aı		.232	.780	.329	.834	.665	.958	.236	.049	.552	.357	.967	.419	.362	.855	.790	.003
	phase	м	210*	010	070	010	140	.000	.060	050	080	.000	.110	010	.080	.040	060	060
			.049	.936	.542	.928	.205	.985	.569	.626	.445	.995	.306	.939	.486	.695	.565	.551
		F	.040	.070	.000	.000	.080	.010	.010	130	160	070	090	010	.120	.130	.110	.000
FPC2			.668	.492	.972	.995	.417	.907	.903	.215	.115	.511	.374	.900	.226	.204	.294	.964
1 12	de	м	.130	.170	.060	050	.070	020	160	.020	.040	150	010	.060	160	070	010	.050
	litu		.228	.116	.589	.634	.515	.827	.130	.883	.746	.157	.914	.604	.143	.517	.944	.622
	amplitude	F	070	050	.090	.060	.060	.020	020	.220*	.270**	.120	.100	070	080	080	030	060
	а		.473	.613	.373	.559	.575	.837	.875	.033	.008	.236	.332	.526	.430	.445	.782	.551
	a)	м	.090	050	.010	.090	020	030	030	.170	030	.100	.120	.150	160	.130	130	150
	phase		.394	.645	.909	.418	.827	.795	.795	.110	.798	.366	.247	.161	.145	.242	.223	.168
	p	F	100	100	220*	.020	070	060	.020	.030	010	.060	.080	060	010	.090	.160	020
FPC3			.333	.318	.033	.859	.482	.578	.829	.740	.900	.562	.433	.562	.943	.387	.114	.866
#	ıde	М	.010	190	030	.090	150	130	.110	130	.020	060	.100	.070	090	250*	050	.240*
	litu		.897	.070	.756	.427	.172	.221	.299	.230	.870	.601	.368	.513	.398	.020	.613	.027
	amplitude	F	.130	.080	.080	030	.050	130	130	240*	040	030	090	.010	.070	060	140	.070
	а		.214	.448	.449	.739	.619	.215	.208	.020	.710	.740	.392	.951	.483	.547	.159	.496

Table S3: Table of Spearman's correlation coefficients and p-values between individual variables of fathers (life-history features, face centroid size and score on Principal Components) and descriptors of the growth curves of their offspring (Functional Principal Components 1–3 phase and amplitude).

\*\*\*. Correlation is significant at the 0.01 level.

L. Koníková, M. Králík, O. Klíma, M. Čuta

Spearman	correlation	Sex	Height	Weight	Head circumf.	Head width	Head length	Head height	Ft - ft	Zy - zy	Go - go	PFL	MFL	Nose to chin	Nose width	Nose height	Mouth width	Mouth height
		М	.050	020	.010	.230*	070	.090	010	.210	.020	.040	.070	.090	.000	.040	.080	.030
	phase	IVI	.652	.870	.900	.030	.529	.384	.895	.052	.887	.728	.535	.415	.999	.732	.434	.802
	ph	F	060	.110	.000	.130	.100	.050	.080	.090	.080	.060	.040	.080	.020	.000	050	030
FPC1		'	.569	.294	.962	.196	.313	.597	.415	.391	.416	.573	.689	.445	.838	.989	.600	.806
₾	в	М	.460**	.190	.180	040	.170	.090	.100	080	.240*	.060	.060	130	.040	.200	.000	.010
	Ϊţ	141	.000	.077	.089	.692	.116	.429	.345	.448	.022	.576	.594	.230	.722	.058	.992	.939
	amplitude	F	.450**	.260*	.120	.120	.030	.220*	.110	.150	.130	.030	.090	.060	.100	.200*	.060	.160
	ā		.000	.010	.242	.257	.746	.029	.269	.146	.191	.781	.381	.584	.339	.047	.554	.110
	phase	М	070	.070	030	030	050	080	.060	.150	010	.000	.040	.070	.020	090	.080	190
			.532	.498	.777	.762	.635	.464	.578	.168	.905	.982	.696	.490	.875	.402	.480	.081
		F	.090	020	.060	.040	.010	.000	120	110	070	040	.050	020	.070	.040	.030	020
FPC2	Ш	·	.374	.882	.582	.720	.950	.995	.260	.288	.485	.725	.649	.832	.518	.693	.773	.865
1 12	de	м	080	150	.020	.140	.020	.080	100	090	040	.020	080	010	070	.040	130	.190
	lit l		.452	.151	.835	.178	.864	.456	.346	.399	.679	.834	.435	.957	.530	.734	.242	.073
	amplitude	F	250*	080	100	140	070	.010	.050	.050	060	.070	040	.020	150	110	090	030
	ā	·	.013	.442	.331	.161	.504	.895	.622	.620	.557	.522	.698	.812	.157	.280	.382	.752
	ا ا	м	030	170	030	060	.030	.040	220*	120	.010	040	.030	.070	050	090	200	.110
	phase		.766	.110	.753	.552	.803	.677	.043	.276	.939	.678	.812	.510	.645	.400	.056	.294
	h	F	.230*	.170	.020	.110	060	.150	.090	.140	010	.020	.070	.110	050	.070	170	.000
FPC3		·	.027	.104	.879	.269	.566	.148	.370	.159	.954	.857	.482	.294	.619	.517	.098	.966
=	de	м	.370**	.110	.180	.320**	010	.220*	.240*	.200	.050	.020	.170	.070	.060	.090	.260*	070
	amplitude		.000	.328	.102	.003	.907	.038	.026	.061	.657	.858	.120	.534	.559	.413	.013	.525
	lα	F	.120	020	040	060	.020	.000	130	140	.010	040	.000	030	.070	.140	.040	060
	am	ŀ	.243	.835	.672	.577	.818	.999	.211	.181	.929	.686	.975	.802	.519	.171	.674	.593

Table S4: Table of Spearman's correlation coefficients and p-values between individual variables of fathers (anthropometric measurements) and descriptors of the growth curves of their offspring (Functional Principal Components 1–3 phase and amplitude).
\*\*. Correlation is significant at the 0.01 level.

\*. Correlation is significant at the 0.05 level.

<sup>\*.</sup> Correlation is significant at the 0.05 level.

Spearman	correlation	Sex	Age	Birth order	Number of siblings	Centroid Size	PC1 score	PC2 score	PC3 score	PC4 score	PC5 score	PC6 score	PC8 score	PC9 score	PC10 score	PC12 score	PC13 score	PC14 score
		М	130	.150	.020	120	020	.170	.090	020	.060	010	.000	.040	040	060	.000	.170
	phase	171	.245	.156	.844	.259	.873	.110	.416	.834	.571	.932	.984	.687	.685	.585	.994	.123
	h	F	.080	170	.020	.120	030	120	.020	110	.040	.050	160	.020	070	090	160	200
FPC1		•	.460	.094	.838	.225	.804	.237	.870	.295	.704	.659	.119	.855	.528	.368	.129	.053
윤	qe	м	.160	040	040	.140	070	120	.030	020	110	.050	.090	060	.080	.290**	050	040
	it	101	.135	.723	.731	.186	.523	.253	.776	.889	.296	.660	.427	.589	.458	.007	.620	.720
	amplitude	F	070	.030	.000	.150	.090	110	.050	.120	110	.050	.130	.060	010	.080	060	.200
	aı	•	.516	.792	.998	.150	.380	.291	.659	.261	.288	.643	.198	.580	.933	.453	.551	.056
	phase	М	050	.060	.130	010	.060	.000	030	210*	.010	060	120	.060	110	260*	.270*	.020
			.659	.576	.219	.949	.564	.969	.770	.049	.925	.559	.260	.603	.316	.015	.010	.821
		F	.030	150	110	.100	.130	.090	110	.090	020	.050	010	.090	.150	070	.060	120
FPC2		·	.762	.153	.292	.352	.210	.360	.294	.384	.853	.663	.959	.404	.150	.511	.568	.238
표	qe	м	.050	030	170	150	130	.050	020	.150	.100	060	.100	070	.040	.150	140	.000
	ij		.669	.763	.103	.166	.243	.662	.834	.161	.341	.560	.365	.500	.684	.153	.184	.972
	amplitude	F	.020	.160	.040	250*	140	.020	010	050	.050	100	.000	080	040	.170	.060	.150
	aı	·	.877	.114	.671	.013	.181	.884	.946	.635	.635	.319	.977	.437	.695	.097	.565	.135
	a.	м	.100	010	140	.120	.030	.050	060	.200	300**	.050	.010	130	220*	.130	.050	070
	phase		.365	.929	.200	.256	.786	.618	.574	.068	.005	.673	.904	.239	.037	.218	.677	.514
	h	F	200*	220*	030	.080	.190	200	.090	.140	140	070	030	.060	.200	090	.090	110
FPC3		•	.049	.029	.787	.454	.071	.051	.395	.172	.184	.502	.741	.566	.057	.385	.361	.268
#	de	м	020	.100	.100	.070	070	.050	.150	020	.160	.020	010	.170	.160	130	.020	.110
	amplitude		.848	.332	.356	.510	.500	.676	.170	.871	.126	.854	.935	.120	.136	.226	.850	.325
	μ	F	.020	.140	.030	.120	170	.070	.090	120	.050	010	.040	.000	120	.100	230*	050
	ai	•	.824	.189	.735	.240	.094	.478	.372	.247	.654	.912	.695	.997	.263	.328	.028	.605

Table S5: Table of Spearman's correlation coefficients and p-values between individual variables of mothers (life-history features, face centroid size and score on Principal Components) and descriptors of the growth curves of their offspring (Functional Principal Components 1–3 phase and amplitude).

\*\*. Correlation is significant at the 0.01 level.

L. Koníková, M. Králík, O. Klíma, M. Čuta

Spearman	correlation	Sex	Height	Weight	Head circumf.	Head width	Head length	Head height	Ft - ft	Zy - zy	Go - go	PFL	MFL	Nose to chin	Nose width	Nose height	Mouth width	Mouth height
		М	140	070	030	200	040	010	.070	.030	.010	020	150	070	.060	050	020	.010
	phase	101	.207	.545	.775	.066	.683	.941	.495	.780	.905	.868	.151	.492	.607	.676	.855	.940
1	ph	F	.090	030	.120	.050	.070	.050	.270**	.040	.010	.150	.180	.190	.010	.050	.040	.020
FPC1		'	.405	.739	.246	.659	.497	.627	.008	.676	.916	.150	.084	.068	.941	.608	.724	.870
₾	de	М	.540**	.340**	.170	.210*	.180	.250*	.030	.210	.060	.160	.200	.210*	060	.160	.070	.110
	amplitude	101	.000	.001	.122	.049	.103	.019	.756	.052	.581	.135	.060	.047	.578	.147	.546	.317
	ημ	F	.420**	.150	.080	.050	080	010	070	090	.030	040	.100	.050	.070	.120	.040	.210*
	ar	·	.000	.148	.448	.612	.444	.959	.517	.401	.747	.679	.350	.620	.509	.241	.725	.042
	phase	М	250*	220*	070	040	170	240*	010	190	140	100	.040	.030	.120	020	010	150
1			.020	.044	.506	.677	.124	.027	.940	.082	.182	.369	.741	.787	.262	.874	.904	.152
	hd	F	.140	.080	.080	.240*	050	.050	.040	070	.010	.060	.010	.060	.160	.100	.020	.020
FPC2		Ė	.169	.465	.465	.019	.651	.620	.724	.499	.924	.533	.948	.553	.111	.329	.883	.843
=	de	м	.030	040	.050	040	.150	.130	.040	.120	.060	.080	160	120	130	080	.140	.130
	lit I		.761	.722	.630	.716	.154	.223	.686	.254	.598	.436	.130	.281	.235	.459	.201	.215
	amplitude	F	420**	140	160	220*	.050	020	130	.070	080	080	160	260**	260*	190	080	200
_	а	Ė	.000	.165	.112	.030	.634	.830	.207	.510	.433	.440	.130	.009	.011	.068	.462	.050
1	۵.	м	.010	.030	.050	.010	.030	.030	.040	.050	.050	.010	.030	110	060	.090	120	.050
1	phase		.945	.808	.620	.912	.815	.798	.716	.625	.630	.904	.808	.324	.588	.429	.266	.666
1	ρh	F	.090	080	020	.090	050	.140	070	030	180	.010	.100	.170	150	.030	120	090
FPC3		Ė	.364	.423	.868	.407	.636	.165	.474	.767	.076	.930	.353	.102	.136	.785	.260	.394
#	de	м	.250*	.110	.030	050	030	.020	.080	.040	.160	060	.080	.080	.180	.130	020	.030
1	l ii	L	.020	.310	.768	.636	.782	.875	.479	.717	.131	.548	.440	.432	.092	.229	.829	.769
1	amplitude	F	.150	.140	.220*	020	.250*	010	.250*	010	.320**	.050	.150	.050	.170	.060	.220*	.040
	a B	Ė	.133	.187	.031	.837	.015	.955	.013	.942	.002	.659	.148	.662	.095	.559	.032	.711

Table S6: Table of Spearman's correlation coefficients and p-values between individual variables of mothers (anthropometric measurements) and descriptors of the growth curves of their offspring (Functional Principal Components 1–3 phase and amplitude).

\*\*. Correlation is significant at the 0.01 level.

<sup>\*.</sup> Correlation is significant at the 0.05 level.

<sup>\*.</sup> Correlation is significant at the 0.05 level.

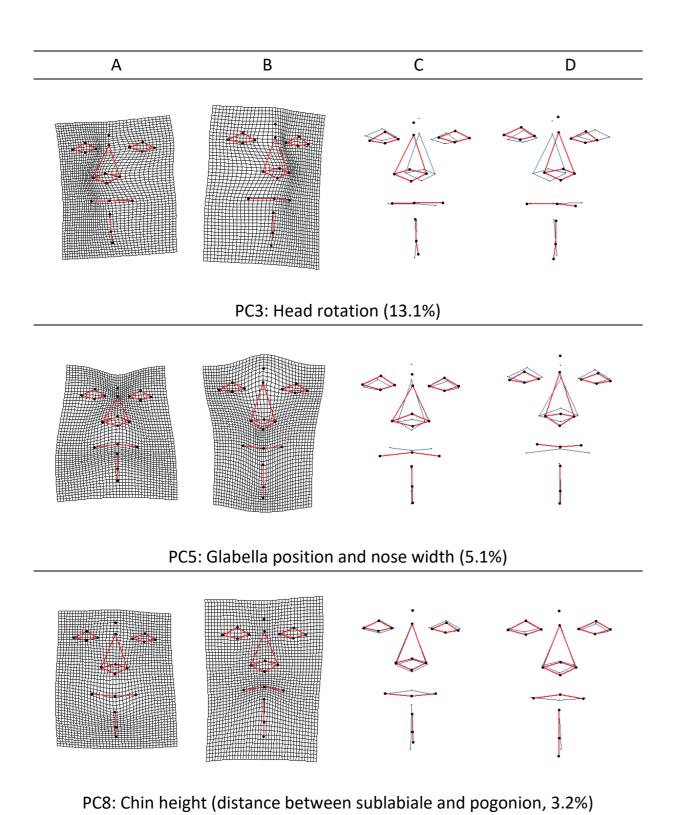
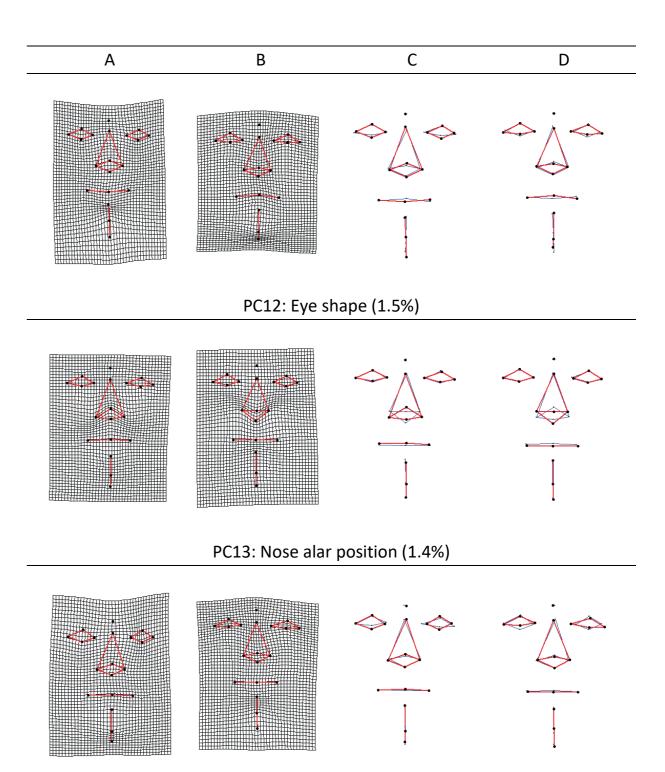


Table S7: Visualization of the difference between the reference and target shape (A, C from minimum to maximum and B, D from maximum to minimum of the score represented by given component) on the Principal Components which significantly correlated with descriptors of the growth curves of offspring, shown by the thin-plate spline (TPS) method (left) and the points method (right), and percentage of explained variance (R-package geomorph, Adams et al. 2020).



PC14: Chin shape (distance between pogonion and gnathion, 1.2%)

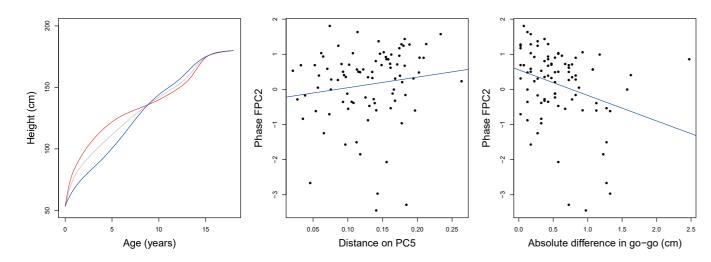


Figure S1: Phase FPC2 growth curve variations in boys and respective relationships in parents. Mean growth curve is marked grey, red curve represents positive values (+ 3SD), and blue curve represents negative values (- 3SD) within the curve change represented by individual Functional Principal Component (FPC).

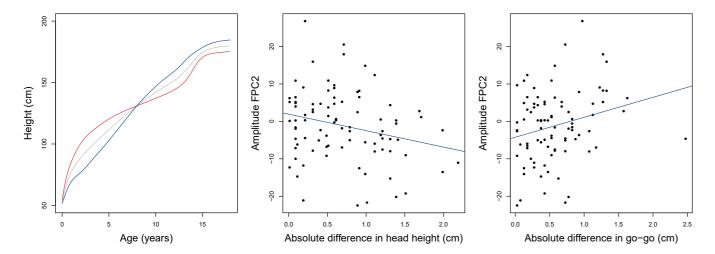


Figure S2: Amplitude FPC2 growth curve variations in boys and respective relationships in parents. Mean growth curve is marked grey, red curve represents positive values (+ 3SD), and blue curve represents negative values (- 3SD) within the curve change represented by individual Functional Principal Component (FPC).

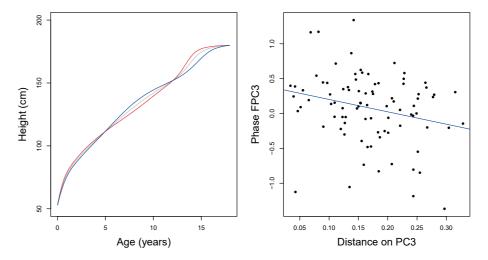


Figure S3: Phase FPC3 growth curve variations in boys and respective relationships in parents. Mean growth curve is marked grey, red curve represents positive values (+ 3SD), and blue curve represents negative values (- 3SD) within the curve change represented by individual Functional Principal Component (FPC).

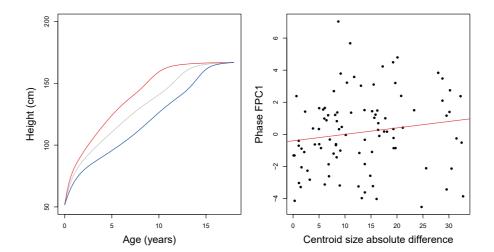


Figure S4: Phase FPC1 growth curve variations in girls and respective relationships in parents. Mean growth curve is marked grey, red curve represents positive values (+ 3SD), and blue curve represents negative values (- 3SD) within the curve change represented by individual Functional Principal Component (FPC).

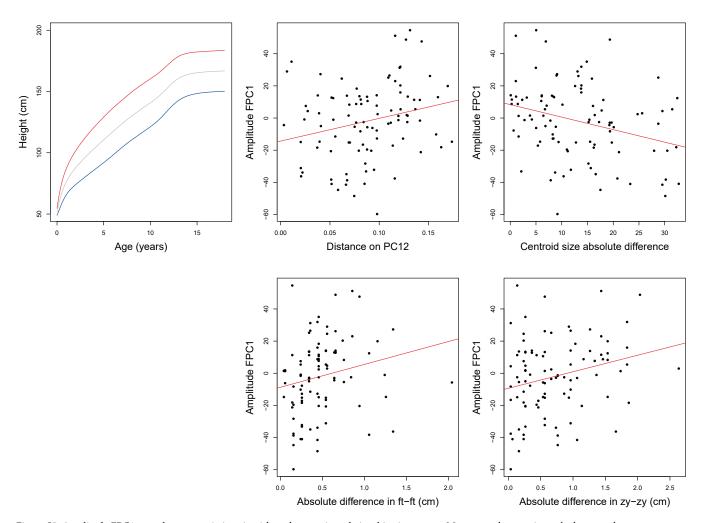


Figure S5: Amplitude FPC1 growth curve variations in girls and respective relationships in parents. Mean growth curve is marked grey, red curve represents positive values (+ 3SD), and blue curve represents negative values (- 3SD) within the curve change represented by individual Functional Principal Component (FPC).

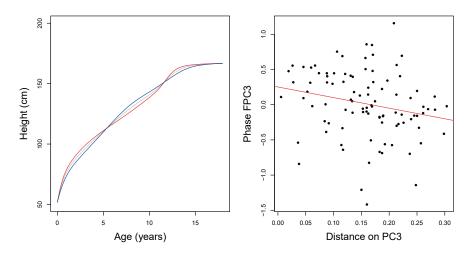


Figure S6: Phase FPC3 growth curve variations in girls and respective relationships in parents. Mean growth curve is marked grey, red curve represents positive values (+ 3SD), and blue curve represents negative values (- 3SD) within the curve change represented by individual Functional Principal Component (FPC).