

Supplementary Material

Title: Correspondence Between Perceived Pubertal Development and Hormone Levels in 9-10 Year-Olds From the Adolescent Brain Cognitive Development Study

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Supplementary Table 1. Pubertal Development Scale summary measures for male and female youth based on caregiver or youth self-report. A minimum number of questions were required for a valid calculation of each metric. Number of subject's not meeting the minimum number of question are listed as non-valid. The number of subjects with valid estimates are presented along with the mean and (standard deviation, sd) or frequency (%) of each category.

	Caregiver Report						Youth Report					
	Male			Female			Male			Female		
	Non-valid N	Valid N	Mean (sd)	Non-valid N	Valid N	Mean (sd)	Non-valid N	N	Mean (sd)	Non-valid N	N	Mean (sd)
Average PDS	90	6051	1.4 (0.38)	97	5562	1.8 (0.53)	880	5278	1.7 (0.47)	1321	4307	1.7 (0.51)
Gondal Score	255	5873	1.5 (0.36)	286	5365	1.8 (0.49)	2275	3822	1.7 (0.49)	2866	2635	1.8 (0.53)
Adrenal Score	199	5908	1.4 (0.56)	169	5457	1.7 (0.73)	1097	5061	1.6 (0.63)	973	4655	1.7 (0.66)
PDS Category	206	5935		199	5460		694	5464		1560	4068	
Pre			70.06%			30.74%			29.94%			25.57%
Early			24.06%			23.61%			47.62%			26.84%
Mid			5.31%			43.00%			20.46%			44.22%
Late			0.49%			2.55%			1.78%			3.10%
Post			0.07%			0.11%			0.20%			0.27%

Supplementary Table 2.

Caregiver-youth agreement for Pubertal Development Scale items and summary scores by sex and in relation to the biological mother or biological father as caregiver reporting. Kappa coefficient means (95% confidence intervals, CI) as well as polychoric coefficients rho (standard error, SE).

Males						
	Biological Mothers			Biological Fathers		
PDS Items	N	Kappa (95% CI)	Rho (SE)	N	Kappa (95% CI)	Rho (SE)
Height	3291	0.15 (0.12, 0.18)	0.17 (0.02)	403	0.24 (0.15, 0.34)	0.28 (0.06)
Body Hair	4804	0.13 (0.10, 0.15)	0.21 (0.02)	592	0.16 (0.08, 0.24)	0.24 (0.06)
Skin Changes	4334	0.19 (0.16, 0.22)	0.31 (0.02)	536	0.23 (0.14, 0.33)	0.37 (0.06)
Voice Change	4853	0.10 (0.07, 0.12)	0.30 (0.03)	600	0.09 (0.03, 0.16)	0.24 (0.08)
Facial Hair	4879	0.15 (0.11, 0.18)	0.39 (0.03)	593	0.12 (0.02, 0.22)	0.33 (0.09)
PDS Summary Scores	N	Kappa (95% CI)	Rho (SE)	N	Kappa (95% CI)	Rho (SE)
Average PDS	4390	0.19 (0.16, 0.22)	0.22 (0.02)	524	0.25 (0.16, 0.33)	0.31 (0.04)
Gondal Score	3081	0.17 (0.14, 0.20)	0.22 (0.02)	378	0.25 (0.15, 0.34)	0.31 (0.05)
Adrenal Score	4101	0.17 (0.14, 0.20)	0.25 (0.02)	504	0.23 (0.14, 0.32)	0.32 (0.05)
PDS Category	4450	0.05 (0.03, 0.08)	0.25 (0.02)	546	0.05 (-0.02, 0.11)	0.24 (0.06)
Females						
	Biological Mothers			Biological Fathers		
PDS Items	N	Kappa (95% CI)	Rho (SE)	N	Kappa (95% CI)	Rho (SE)
Height	2632	0.22 (0.19, 0.26)	0.28 (0.02)	323	0.25 (0.15, 0.35)	0.30 (0.06)
Body Hair	4333	0.38 (0.35, 0.40)	0.47 (0.02)	527	0.37 (0.29, 0.46)	0.47 (0.04)
Skin Changes	3839	0.53 (0.34, 0.40)	0.46 (0.02)	503	0.37 (0.28, 0.45)	0.47 (0.05)
Breast Development	3839	0.53 (0.50, 0.55)	0.63 (0.01)	478	0.50 (0.43, 0.57)	0.60 (0.04)
Menarche	4211	0.80 (0.74, 0.85)	0.98 (0.01)	517	0.86 (0.73, 1.0)	0.99 (0.01)
PDS Summary Scores	N	Kappa (95% CI)	Rho (SE)	N	Kappa (95% CI)	Rho (SE)
Average PDS	3569	0.53 (0.50, 0.55)	0.52 (0.01)	436	0.54 (0.46, 0.63)	0.54 (0.04)
Gondal Score	2112	0.55 (0.51, 0.59)	0.55 (0.02)	259	0.56 (0.45, 0.66)	0.56 (0.05)
Adrenal Score	3791	0.44 (0.41, 0.47)	0.49 (0.01)	467	0.44 (0.45, 0.66)	0.51 (0.04)
PDS Category	3319	0.23 (0.19, 0.26)	0.67 (0.01)	411	0.20 (0.09, 0.31)	0.68 (0.04)

Supplementary Table 3.

Polychoric pairwise correlations for caregiver report of physical features and summary measurements, as well as hormone levels for males and females. NA denotes failed correlation due to limited variance for the pubertal category variable in males.

	Height	Body Hair	Skin	Voice	Facial Hair	Average PDS	Gonadal Score	Adrenal Score	Pubertal Category	DHEA	Testosterone
Height	--	--	--	--	--	--	--	--	--	--	--
Body Hair	0.31	--	--	--	--	--	--	--	--	--	--
Skin	0.20	0.39	--	--	--	--	--	--	--	--	--
Voice	0.14	0.26	0.24	--	--	--	--	--	--	--	--
Facial Hair	0.10	0.34	0.27	0.33	--	--	--	--	--	--	--
Average PDS	0.69	0.75	0.67	0.49	0.49	--	--	--	--	--	--
Gonadal Score	0.87	0.42	0.30	0.53	0.47	0.85	--	--	--	--	--
Adrenal Score	0.30	0.85	0.81	0.30	0.37	0.85	0.44	--	--	--	--
Pubertal Category	0.40	NA	0.40	0.46	0.45	NA	0.67	NA	--	--	--
DHEA	0.11	0.15	0.17	0.06	0.06	0.19	0.13	0.19	0.18	--	--
Testosterone	0.10	0.14	0.15	0.07	0.09	0.18	0.14	0.18	0.18	0.71	--

Females												
	Height	Body Hair	Skin	Breast	Menarche	Average PDS	Gonadal Score	Adrenal Score	Pubertal Category	DHEA	Testosterone	Estradiol
Height	--	--	--	--	--	--	--	--	--	--	--	--
Body Hair	0.33	--	--	--	--	--	--	--	--	--	--	--
Skin	0.27	0.52	--	--	--	--	--	--	--	--	--	--
Breast	0.33	0.52	0.47	--	--	--	--	--	--	--	--	--
Menarche	0.09	0.22	0.18	0.22	--	--	--	--	--	--	--	--
Average PDS	0.61	0.80	0.74	0.77	0.42	--	--	--	--	--	--	--
Gonadal Score	0.74	0.54	0.46	0.80	0.50	0.89	--	--	--	--	--	--
Adrenal Score	0.34	0.89	0.85	0.57	0.23	0.89	0.57	--	--	--	--	--
Pubertal Category	0.40	0.82	0.54	0.85	0.46	0.92	0.83	0.80	--	--	--	--
DHEA	0.11	0.29	0.29	0.28	0.15	0.34	0.26	0.34	0.33	--	--	--
Testosterone	0.14	0.30	0.27	0.27	0.14	0.34	0.26	0.33	0.32	0.75	--	--
Estradiol	0.01	0.11	0.11	0.12	0.08	0.13	0.10	0.13	0.13	0.51	0.55	--

Supplementary Table 4.

Post-hoc comparisons for sociodemographic differences in the average Pubertal Development Scale score for males and females based on caregiver report.

Weight Status Post-hoc Contrasts	Estimate	SE	df	T	p value
Male, Underweight - Male, Overweight	-0.100907933	0.030913646	1632	-3.264187346	0.025
Male, Underweight - Male, Obese	-0.144955375	0.030924431	1632	-4.68740632	<0.001
Male, Overweight - Male, Obese	-0.044047441	0.018625723	1632	-2.364871484	0.260
Male, Healthy Weight - Male, Underweight	0.03839106	0.028452801	1632	1.349289301	0.880
Male, Healthy Weight - Male, Overweight	-0.062516874	0.015021233	1632	-4.161900205	0.001
Male, Healthy Weight - Male, Obese	-0.106564315	0.01491431	1632	-7.145105385	<0.001
Female, Underweight - Female, Overweight	-0.468731541	0.030133844	1632	-15.55498681	<0.001
Female, Underweight - Female, Obese	-0.492419779	0.030450784	1632	-16.17100471	<0.001
Female, Overweight - Female, Obese	-0.023688239	0.01970974	1632	-1.201854445	0.932
Female, Healthy Weight - Female, Underweight	0.221999612	0.027219911	1632	8.155780337	<0.001
Female, Healthy Weight - Female, Overweight	-0.246731928	0.015744781	1632	-15.67071182	<0.001
Female, Healthy Weight - Female, Obese	-0.270420167	0.016216972	1632	-16.67513304	<0.001
Race/Ethnicity Post-hoc Contrasts	Estimate	SE	df	T	p value
Male, White - Male, Other	-0.027947853	0.018822765	1632	-1.484789938	0.898
Male, White - Male, Black	-0.218012329	0.019172922	1632	-11.37084546	<0.001
Male, White - Male, Asian	0.012799551	0.03997627	1632	0.320178727	1.000
Male, Hispanic - Male, White	0.060159499	0.016806607	1632	3.579514915	0.013
Male, Hispanic - Male, Other	0.032211646	0.021964627	1632	1.466523729	0.905
Male, Hispanic - Male, Black	-0.15785283	0.02079544	1632	-7.590742558	<0.001
Male, Hispanic - Male, Asian	0.07295905	0.041902407	1632	1.741166113	0.772
Male, Black - Male, Other	0.190064476	0.023642992	1632	8.038935093	<0.001
Male, Black - Male, Asian	0.23081188	0.043148771	1632	5.349211	<0.001
Male, Asian - Male, Other	-0.040747404	0.042811402	1632	-0.951788599	0.995
Female, White - Female, Other	-0.102016314	0.019332202	1632	-5.277014713	<0.001
Female, White - Female, Black	-0.318317847	0.019576776	1632	-16.25997312	<0.001
Female, White - Female, Asian	-0.024961875	0.040137938	1632	-0.621902282	1.000
Female, Hispanic - Female, White	0.023423735	0.017465102	1632	1.341173686	0.944
Female, Hispanic - Female, Other	-0.07859258	0.022460712	1632	-3.499113539	0.017
Female, Hispanic - Female, Black	-0.294894112	0.021064555	1632	-13.99954136	<0.001

Female, Hispanic - Female, Asian	-0.001538141	0.041992356	1632	-0.036629061	1.000
Female, Black - Female, Other	0.216301533	0.023930141	1632	9.038874088	<0.001
Female, Black - Female, Asian	0.293355972	0.04333539	1632	6.769431923	<0.001
Female, Asian - Female, Other	-0.077054439	0.042924684	1632	-1.795107886	0.738
Highest Education Post-hoc Contrasts	Estimate	SE	df	T	p value
Male, Some College - Male, Graduate Degree	0.065296104	0.016810613	1632	3.884219048	0.004
Male, Some College - Male, Bachelor	0.048537009	0.016494131	1632	2.942683545	0.095
Male, HS Diploma/GED - Male, Some College	0.03365868	0.022165535	1632	1.518514269	0.885
Male, HS Diploma/GED - Male, Graduate Degree	0.098954785	0.02464132	1632	4.015807019	0.002
Male, HS Diploma/GED - Male, Bachelor	0.082195689	0.024250692	1632	3.389416181	0.025
Male, HS Diploma/GED - Male, <HS Diploma	0.013434388	0.034224842	8831	0.392533233	1.000
Male, Bachelor - Male, Graduate Degree	0.016759095	0.014404365	1632	1.163473342	0.978
Male, <HS Diploma - Male, Some College	0.020224293	0.031351468	1632	0.645082783	1.000
Male, <HS Diploma - Male, Graduate Degree	0.085520397	0.033580725	1632	2.546710876	0.244
Male, <HS Diploma - Male, Bachelor	0.068761301	0.033232863	1632	2.069075475	0.550
Female, Some College - Female, Graduate Degree	0.080213792	0.01810965	1632	4.429339597	<0.001
Female, Some College - Female, Bachelor	0.065117907	0.017602326	1632	3.699392141	0.008
Female, HS Diploma/GED - Female, Some College	0.001985359	0.023165708	1632	0.085702516	1.000
Female, HS Diploma/GED - Female, Graduate Degree	0.082199151	0.026103806	1632	3.148933525	0.053
Female, HS Diploma/GED - Female, Bachelor	0.067103266	0.025536077	1632	2.627782878	0.205
Female, HS Diploma/GED - Female, <HS Diploma	0.037013208	0.034439434	1632	1.074733336	0.987
Female, Bachelor - Female, Graduate Degree	0.015095885	0.015048218	1632	1.003167636	0.992
Female, <HS Diploma - Female, Some College	-0.035027848	0.031107686	1632	-1.126019094	0.982
Female, <HS Diploma - Female, Graduate Degree	0.045185944	0.0339604	1632	1.330548052	0.947
Female, <HS Diploma - Female, Bachelor	0.030090059	0.033397386	1632	0.900970472	0.996
Household Income Post-hoc Contrasts	Estimate	SE	df	T	p value
Male, [≥50K & <100K] - Male, [≥100K]	0.025915204	0.014247822	1632	1.818888854	0.454
Male, [≥50K & <100K] - Male, [<50K]	-0.026240225	0.016487585	1632	-1.591514192	0.604
Male, [<50K] - Male, [≥100K]	0.052155429	0.018074982	1632	2.88550384	0.046
Female, [≥50K & <100K] - Female, [≥100K]	0.072689736	0.014854516	1632	4.893443719	<0.001
Female, [≥50K & <100K] - Female, [<50K]	-0.033340875	0.017338917	1632	-1.922892615	0.388
Female, [<50K] - Female, [≥100K]	0.106030611	0.018983784	1632	5.58532543	<0.001

Supplementary Table 5.

Post-hoc comparisons for sociodemographic differences in DHEA levels for males and females.

Weight Status Post-hoc Contrasts	Estimate	SE	df	T	p value
Male, Underweight - Male, Overweight	-16.58239623	5.693141064	444	-2.912697234	0.072
Male, Underweight - Male, Obese	-30.74821024	5.71370703	444	-5.381481773	<0.001
Male, Overweight - Male, Obese	-14.16581401	3.41467523	444	-4.148509904	0.001
Male, Healthy Weight - Male, Underweight	6.863542346	5.275370492	444	1.301054088	0.898
Male, Healthy Weight - Male, Overweight	-9.718853884	2.754573493	444	-3.528260875	0.011
Male, Healthy Weight - Male, Obese	-23.88466789	2.757044332	444	-8.663142488	<0.001
Female, Underweight - Female, Overweight	-18.78851391	6.06851541	444	-3.096064299	0.043
Female, Underweight - Female, Obese	-28.55809052	6.107054839	444	-4.676245961	<0.001
Female, Overweight - Female, Obese	-9.769576617	3.70606357	444	-2.636106055	0.146
Female, Healthy Weight - Female, Underweight	8.062109672	5.577817999	444	1.445387726	0.835
Female, Healthy Weight - Female, Overweight	-10.72640423	2.964179499	444	-3.61867567	0.008
Female, Healthy Weight - Female, Obese	-20.49598085	2.975623141	444	-6.887962582	<0.001
Race/Ethnicity Post-hoc Contrasts	Estimate	SE	df	T	p value
Male, White - Male, Other	0.828784706	3.548720293	444	0.233544669	1.000
Male, White - Male, Black	-18.766333	3.739827297	444	-5.017967812	<0.001
Male, White - Male, Asian	-8.313563016	6.517689114	444	-1.275538442	0.959
Male, Hispanic - Male, White	4.624960987	3.075137487	444	1.503985108	0.890
Male, Hispanic - Male, Other	5.453745693	4.116893722	444	1.324723459	0.948
Male, Hispanic - Male, Black	-14.14137201	4.030658334	444	-3.508452178	0.018
Male, Hispanic - Male, Asian	-3.688602029	6.919000101	444	-0.533112007	1.000
Male, Black - Male, Other	19.5951177	4.593222829	444	4.266093424	0.001
Male, Black - Male, Asian	10.45276998	7.296312401	444	1.432609983	0.916
Male, Asian - Male, Other	9.142347722	7.142408628	444	1.280009055	0.958
Female, White - Female, Other	-2.234323322	3.648286526	444	-0.612430878	1.000
Female, White - Female, Black	-31.3229053	3.769044129	444	-8.310570063	<0.001
Female, White - Female, Asian	-13.1746971	6.570931929	444	-2.00499674	0.596
Female, Hispanic - Female, White	9.485116697	3.142960229	444	3.017892689	0.079
Female, Hispanic - Female, Other	7.250793375	4.230493855	444	1.713935447	0.787
Female, Hispanic - Female, Black	-21.83778861	4.081115746	444	-5.350935863	<0.001
Female, Hispanic - Female, Asian	-3.6895804	6.95574541	444	-0.530436378	1.000

Female, Black - Female, Other	29.08858198	4.703098107	444	6.18498303	<0.001
Female, Black - Female, Asian	18.14820821	7.318836129	444	2.479657679	0.282
Female, Asian - Female, Other	10.94037377	7.2116775	444	1.517035915	0.885
Highest Education Post-hoc Contrasts	Estimate	SE	df	T	p value
Male, Some College - Male, Bachelor	-3.013237611	2.96735483	444	-1.015462519	0.991
Male, HS Diploma/GED - Male, Some College	7.010304885	4.056273833	444	1.728262236	0.779
Male, HS Diploma/GED - Male, Graduate Degree	1.744669323	4.516108615	3905	0.386321382	1.000
Male, HS Diploma/GED - Male, Bachelor	3.997067274	4.436952328	444	0.900858738	0.996
Male, HS Diploma/GED - Male, < HS Diploma	-2.097877206	6.461400373	3905	-0.324678411	1.000
Male, Bachelor - Male, Graduate Degree	-2.252397951	2.623258237	444	-0.858626085	0.998
Male, <HS Diploma - Male, Some College	9.108182091	6.054023722	444	1.504484044	0.890
Male, <HS Diploma - Male, Graduate Degree	3.842546529	6.434321951	3905	0.597195254	1.000
Male, <HS Diploma - Male, Bachelor	6.09494448	6.36918686	444	0.956942325	0.994
Female, Some College - Female, Graduate Degree	2.912687659	3.278574014	444	0.888400764	0.997
Female, Some College - Female, Bachelor	0.947183925	3.131165512	444	0.30250203	1.000
Female, HS Diploma/GED - Female, Some College	9.385786772	4.502494458	444	2.084574864	0.539
Female, HS Diploma/GED - Female, Graduate Degree	12.29847443	4.978123042	444	2.47050431	0.287
Female, HS Diploma/GED - Female, Bachelor	10.3329707	4.840152636	444	2.134843976	0.504
Female, HS Diploma/GED - Female, <HS Diploma	11.92968592	6.44392504	444	1.851307371	0.702
Female, Bachelor - Female, Graduate Degree	1.965503735	2.708893353	444	0.725574424	0.999
Female, <HS Diploma - Female, Some College	-2.54389915	5.660222185	444	-0.449434504	1.000
Female, <HS Diploma - Female, Graduate Degree	0.368788509	6.174147284	444	0.059731084	1.000
Female, <HS Diploma - Female, Bachelor	-1.596715226	6.033015178	444	-0.264662889	1.000
Household Income Post-hoc Contrasts	Estimate	SE	df	T	p value
Male, [≥50K & <100K] - Male, [≥100K]	0.157694089	2.60149543	444	0.060616708	1.000
Male, [≥50K & <100K] - Male, [<50K]	1.064782723	3.044359431	444	0.349755917	0.999
Male, [<50K] - Male, [≥100K]	-0.907088634	3.27478987	444	-0.276991401	1.000
Female, [≥50K & <100K] - Female, [≥100K]	-5.503657567	2.669410028	444	-2.06175054	0.309
Female, [≥50K & <100K] - Female, [<50K]	-3.029711267	3.113355369	444	-0.973133776	0.926
Female, [<50K] - Female, [≥100K]	-2.4739463	3.386179033	444	-0.730601151	0.978

Supplementary Table 6.

Post-hoc comparisons for sociodemographic differences in Testosterone levels for males and females.

Weight Status Post-hoc Contrasts	Estimate	SE	df	T	p value
Male, Underweight - Male, Overweight	-5.95064516	2.064988587	444	-2.881684285	0.079
Male, Underweight - Male, Obese	-8.524506208	2.071882573	444	-4.114377097	0.001
Male, Overweight - Male, Obese	-2.573861048	1.228464962	444	-2.095184746	0.420
Male, Healthy Weight - Male, Underweight	2.962357874	1.913230084	444	1.54835422	0.781
Male, Healthy Weight - Male, Overweight	-2.988287286	0.990502961	444	-3.016939274	0.054
Male, Healthy Weight - Male, Obese	-5.562148334	0.997932116	444	-5.573674048	<0.001
Female, Underweight - Female, Overweight	-4.385115287	2.170640392	444	-2.020194273	0.469
Female, Underweight - Female, Obese	-6.278965499	2.186498203	444	-2.871699364	0.081
Female, Overweight - Female, Obese	-1.893850212	1.347993749	444	-1.404939907	0.855
Female, Healthy Weight - Female, Underweight	1.836873758	1.991419979	444	0.922393959	0.984
Female, Healthy Weight - Female, Overweight	-2.548241529	1.077460478	444	-2.365044084	0.261
Female, Healthy Weight - Female, Obese	-4.442091741	1.081818261	444	-4.106134924	0.001
Race/Ethnicity Post-hoc Contrasts	Estimate	SE	df	T	p value
Male, White - Male, Other	-0.567476716	1.293470013	444	-0.438724292	1.000
Male, White - Male, Black	-5.968717022	1.377201115	444	-4.333947278	0.001
Male, White - Male, Asian	-0.442864298	2.358944135	444	-0.187738358	1.000
Male, Hispanic - Male, White	0.0852526	1.125756902	444	0.075729138	1.000
Male, Hispanic - Male, Other	-0.482224116	1.506832668	444	-0.320024994	1.000
Male, Hispanic - Male, Black	-5.883464422	1.491991363	444	-3.943363593	0.004
Male, Hispanic - Male, Asian	-0.357611698	2.507729125	444	-0.142603798	1.000
Male, Black - Male, Other	5.401240306	1.690367292	444	3.195305738	0.048
Male, Black - Male, Asian	5.525852724	2.652872318	444	2.082969726	0.541
Male, Asian - Male, Other	-0.124612418	2.5868349	444	-0.048171771	1.000
Female, White - Female, Other	-0.98226556	1.333883984	444	-0.736395048	0.999
Female, White - Female, Black	-11.15122096	1.391996151	444	-8.010956745	<0.001
Female, White - Female, Asian	-7.649634597	2.368552489	444	-3.229666488	0.043
Female, Hispanic - Female, White	1.205609825	1.157581735	444	1.041490021	0.990
Female, Hispanic - Female, Other	0.223344265	1.548663172	444	0.144217457	1.000
Female, Hispanic - Female, Black	-9.945611133	1.503458937	444	-6.615153157	<0.001
Female, Hispanic - Female, Asian	-6.444024773	2.508850597	444	-2.568516746	0.236

Female, Black - Female, Other	10.1689554	1.725980309	444	5.891698384	<0.001
Female, Black - Female, Asian	3.50158636	2.650871406	444	1.320918983	0.949
Female, Asian - Female, Other	6.667369037	2.600358924	444	2.56401875	0.238
Highest Education Post-hoc Contrasts	Estimate	SE	df	T	p value
Male, Some College - Male, Graduate Degree	-0.864161597	1.095798647	444	-0.788613491	0.999
Male, Some College - Male, Bachelor	-0.558473289	1.086787626	444	-0.513875274	1.000
Male, HS Diploma/GED - Male, Some College	2.8666115	1.471375797	444	1.94825245	0.636
Male, HS Diploma/GED - Male, Graduate Degree	2.002449903	1.633796225	3798	1.225642386	0.968
Male, HS Diploma/GED - Male, Bachelor	2.308138211	1.6110482	444	1.432693454	0.916
Male, HS Diploma/GED - Male, <HS Diploma	-2.739069572	2.334327391	3798	-1.173387068	0.976
Male, Bachelor - Male, Graduate Degree	-0.305688308	0.953562268	444	-0.320575088	1.000
Male, <HS Diploma - Male, Some College	5.605681072	2.188593078	444	2.56131719	0.239
Male, <HS Diploma - Male, Graduate Degree	4.741519475	2.326680766	3798	2.037890003	0.572
Male, <HS Diploma - Male, Bachelor	5.047207783	2.307824394	444	2.186998194	0.467
Female, Some College - Female, Graduate Degree	1.462781427	1.208516427	444	1.210394326	0.971
Female, Some College - Female, Bachelor	0.29310249	1.154687705	444	0.253837024	1.000
Female, HS Diploma/GED - Female, Some College	1.838429945	1.640764132	444	1.120471803	0.982
Female, HS Diploma/GED - Female, Graduate Degree	3.301211372	1.823978308	444	1.80989618	0.729
Female, HS Diploma/GED - Female, Bachelor	2.131532436	1.772815306	444	1.202343204	0.972
Female, HS Diploma/GED - Female, <HS Diploma	1.404992854	2.386295392	444	0.588775748	1.000
Female, Bachelor - Female, Graduate Degree	1.169678937	0.995000848	444	1.175555718	0.976
Female, <HS Diploma - Female, Some College	0.433437091	2.115783614	444	0.204858894	1.000
Female, <HS Diploma - Female, Graduate Degree	1.896218518	2.309772293	444	0.820954742	0.998
Female, <HS Diploma - Female, Bachelor	0.726539582	2.257983788	444	0.321764747	1.000
Household Income Posthoc Contrasts	Estimate	SE	df	T	p value
Male, [≥50K & <100K] - Male, [≥100K]	0.494077059	0.94677543	444	0.521852431	0.995
Male, [≥50K & <100K] - Male, [<50K]	-0.411396591	1.107488704	444	-0.37146798	0.999
Male, [<50K] - Male, [≥100K]	0.905473651	1.194352342	444	0.758129422	0.974
Female, [≥50K & <100K] - Female, [≥100K]	-0.74195744	0.979369852	444	-0.757586563	0.974
Female, [≥50K & <100K] - Female, [<50K]	0.004678149	1.146227899	444	0.004081343	1.000
Female, [<50K] - Female, [≥100K]	-0.746635589	1.248912012	444	-0.597828816	0.991

Supplementary Table 7.

Post-hoc comparisons for sociodemographic differences in Estradiol levels for females only.

Weight Status Post-hoc Contrasts	Estimate	SE	df	T	p value
Healthy Weight - Underweight	-0.01179736	0.064517394	145	-0.18285549	0.998
Healthy Weight - Overweight	-0.034451723	0.034166244	145	-1.00835559	0.745
Healthy Weight - Obese	-0.06694689	0.034611356	145	-1.934246367	0.218
Underweight - Overweight	-0.022654363	0.070065307	145	-0.323332105	0.988
Underweight - Obese	-0.05514953	0.070749778	145	-0.779501109	0.864
Overweight - Obese	-0.032495167	0.042888065	145	-0.757673882	0.873
Race/Ethnicity Post-hoc Contrasts	Estimate	SE	df	T	p value
Hispanic - White	0.051923952	0.038738373	145	1.340375117	0.667
Hispanic - Black	-0.114579605	0.048893122	1699	-2.343470838	0.132
Hispanic - Asian	0.047013807	0.081520429	1699	0.576711964	0.978
Hispanic - Other	-0.034765779	0.050042789	145	-0.694721057	0.957
White - Black	-0.166503557	0.043821445	145	-3.799590735	0.002
White - Asian	-0.004910145	0.077203146	145	-0.063600322	1.000
White - Other	-0.086689731	0.042122815	145	-2.058023188	0.244
Black - Asian	0.161593412	0.085636591	1699	1.886966895	0.325
Black - Other	0.079813826	0.054235923	145	1.471604443	0.583
Asian - Other	-0.081779586	0.08374465	145	-0.976535045	0.865
Highest Education Post-hoc Contrasts	Estimate	SE	df	T	p value
HS Diploma/GED - <HS Diploma	-0.010871147	0.074380474	1699	-0.146155919	1.000
HS Diploma/GED - Some College	-0.036616897	0.052151869	1699	-0.702120518	0.956
HS Diploma/GED - Bachelor	-0.108435389	0.056238634	1699	-1.928129842	0.303
HS Diploma/GED - Graduate Degree	-0.118352217	0.057922861	1699	-2.043272998	0.246
<HS Diploma - Some College	-0.025745751	0.065335287	1699	-0.394055829	0.995
<HS Diploma - Bachelor	-0.097564243	0.069983296	1699	-1.394107567	0.632
<HS Diploma - Graduate Degree	-0.10748107	0.07172816	1699	-1.498450124	0.564
Some College - Bachelor	-0.071818492	0.036499981	1699	-1.967630942	0.282
Some College - Graduate Degree	-0.08173532	0.038420759	1699	-2.12737387	0.209
Bachelor - Graduate Degree	-0.009916827	0.031456805	1699	-0.315252219	0.998
Household Income Post-hoc Contrasts	Estimate	SE	df	T	p value

$[\geq 50K \ \& \ < 100K] - [< 50K]$	-0.070311266	0.036627929	1699	-1.919608022	0.133
$[\geq 50K \ \& \ < 100K] - [\geq 100K]$	-0.02380264	0.031121652	145	-0.764825711	0.725
$[< 50K] - [\geq 100K]$	0.046508626	0.039818834	145	1.168005701	0.474

Supplementary Table 8.

Latent factor 1 median loadings and 95% CI for males.

	Robust GFA: PDS & Hormones Only	Robust GFA: Split Half 1	Robust GFA: Split Half 2	Robust GFA: BMlz	Robust GFA: BMlz+SES	Robust GFA: BMlz+SES+ Race/Ethnicity	Robust GFA: Residuals (covariates: age + race/ethnicity + BMI + SES + site)
Height	0.188 (0.126, 0.238)	0.17 (0.2515, 0.075)	0.17 (0.2495, 0.075)	0.196 (0.246, 0.141)	0.2 (0.1465, 0.257)	0.148 (0.2045, 0.09)	0.077 (0.1415, 0.0275)
Body Hair	0.25 (0.19, 0.314)	0.233 (0.33, 0.095)	0.233 (0.3285, 0.088)	0.257 (0.3235, 0.192)	0.257 (0.193, 0.3125)	0.19 (0.259, 0.136)	0.074 (0.1835, 0.0225)
Skin	0.274 (0.2155, 0.3305)	0.259 (0.343, 0.145)	0.262 (0.3495, 0.142)	0.282 (0.3365, 0.227)	0.277 (0.222, 0.3345)	0.252 (0.306, 0.1875)	0.132 (0.224, 0.078)
Voice	0.15 (0.089, 0.203)	0.148 (0.2315, 0.0385)	0.114 (0.1965, 0.007)	0.147 (0.212, 0.0965)	0.153 (0.091, 0.2085)	0.094 (0.1565, 0.0355)	0.004 (0.088, -0.044)
Facial Hair	0.174 (0.1105, 0.2365)	0.182 (0.2695, 0.0585)	0.138 (0.221, 0.0195)	0.179 (0.232, 0.121)	0.179 (0.12, 0.2285)	0.138 (0.2025, 0.074)	0.046 (0.138, -0.004)
Testosterone	0.828 (0.795, 0.8635)	0.83 (0.8795, 0.776)	0.824 (0.8735, 0.7745)	0.824 (0.8615, 0.7865)	0.823 (0.7885, 0.8625)	0.82 (0.856, 0.7835)	0.825 (0.864, 0.7925)
DHEA	0.829 (0.7915, 0.865)	0.824 (0.8765, 0.7725)	0.826 (0.883, 0.778)	0.829 (0.863, 0.7935)	0.826 (0.7875, 0.869)	0.819 (0.856, 0.7785)	0.825 (0.8595, 0.7935)
BMlz				0.24 (0.2875, 0.194)	0.25 (0.1985, 0.304)	0.198 (0.245, 0.1535)	
Income					-0.096 (-0.145, -0.0505)	0 (0, -0.0645)	
Parent Education					-0.158 (-0.2065, -0.105)	0 (0, -0.0895)	
White Non-Hispanic						0 (0, 0)	
Black						0 (0, 0)	
Hispanic						0 (0, 0)	
Asian						0 (0, 0)	
Other						0 (0, 0)	

Supplementary Table 9.

Latent factor 2 median loadings and 95% CI for males.

	Robust GFA: PDS & Hormones Only	Robust GFA: Split Half 1	Robust GFA: Split Half 2	Robust GFA: BMIz	Robust GFA: BMIz+SES	Robust GFA: BMIz+SES+. Race/Ethnicity	Robust GFA: Residuals (covariates: age + race/ethnicity + BMI + SES + site)
Height	0.375 (0.435, 0.3145)	0.377 (0.2865, 0.463)	0.362 (0.4495, 0.2745)	0.386 (0.3225, 0.4485)	0.386 (0.442, 0.3275)	0.383 (0.3185, 0.444)	0.344 (0.28, 0.417)
Body Hair	0.555 (0.604, 0.5135)	0.54 (0.4745, 0.611)	0.562 (0.631, 0.4945)	0.554 (0.5085, 0.6015)	0.514 (0.562, 0.4625)	0.542 (0.4965, 0.59)	0.564 (0.5135, 0.6095)
Skin	0.452 (0.5025, 0.4015)	0.44 (0.374, 0.506)	0.456 (0.523, 0.391)	0.448 (0.401, 0.499)	0.4 (0.452, 0.343)	0.476 (0.423, 0.5255)	0.477 (0.4225, 0.5285)
Voice	0.434 (0.492, 0.379)	0.466 (0.3825, 0.539)	0.4 (0.482, 0.3225)	0.427 (0.373, 0.4895)	0.414 (0.466, 0.3655)	0.414 (0.3565, 0.4745)	0.412 (0.354, 0.4755)
Facial Hair	0.474 (0.526, 0.417)	0.496 (0.4215, 0.5785)	0.437 (0.515, 0.3575)	0.468 (0.4125, 0.5165)	0.428 (0.4805, 0.3765)	0.464 (0.4025, 0.5165)	0.478 (0.421, 0.524)
Testosterone	-0.128 (-0.071, -0.196)	-0.116 (-0.191, 0)	-0.118 (0, -0.201)	-0.14 (-0.2015, -0.0865)	-0.152 (-0.0955, -0.211)	-0.104 (-0.166, -0.0455)	0 (-0.1025, 0)
DHEA	-0.129 (-0.076, -0.19)	-0.128 (-0.2125, 0)	-0.104 (0, -0.182)	-0.143 (-0.2115, -0.0875)	-0.149 (-0.0955, -0.2095)	-0.113 (-0.1745, -0.06)	0 (-0.1205, 0)
BMIz				0.148 (0.092, 0.199)	0.19 (0.239, 0.1395)	0.12 (0.068, 0.1695)	
Income					-0.222 (-0.1485, -0.3055)	-0.036 (-0.0905, 0.013)	
Parent Education					-0.33 (-0.2535, -0.4065)	-0.104 (-0.155, -0.053)	
White Non-Hispanic						0 (0, 0)	
Black						0 (0, 0)	
Hispanic						0 (0, 0)	
Asian						0 (0, 0)	
Other						0 (0, 0)	

Supplementary Table 10.

Latent factor 1 median loadings and 95% CI for females.

	Robust GFA: PDS & Hormones Only	Robust GFA: Split Half 1	Robust GFA: Split Half 2	Robust GFA: BMIZ	Robust GFA: BMIZ+SES	Robust GFA: BMIZ+SES+ Race/Ethnicity	Robust GFA: Residuals (covariates: age + race/ethnicity + BMI + SES + site)
Height	0.233 (0.2945, 0.1645)	0.292 (0.3835, 0.206)	0.174 (0.0755, 0.2695)	0.283 (0.224, 0.3485)	0.28 (0.217, 0.3445)	0.2 (0.2585, 0.138)	0.431 (0.357, 0.498)
Body Hair	0.452 (0.516, 0.384)	0.473 (0.5745, 0.3795)	0.435 (0.3405, 0.532)	0.504 (0.439, 0.5685)	0.498 (0.427, 0.5685)	0.368 (0.437, 0.3065)	0.59 (0.5355, 0.643)
Skin	0.418 (0.482, 0.3555)	0.452 (0.5455, 0.358)	0.394 (0.2995, 0.4825)	0.471 (0.4015, 0.5355)	0.456 (0.3925, 0.5245)	0.379 (0.4485, 0.316)	0.558 (0.496, 0.61)
Breast	0.416 (0.4795, 0.347)	0.442 (0.546, 0.336)	0.4 (0.3095, 0.496)	0.488 (0.419, 0.561)	0.476 (0.4105, 0.5475)	0.375 (0.4475, 0.306)	0.547 (0.484, 0.6035)
Menstruation	0.225 (0.2745, 0.17)	0.216 (0.317, 0.139)	0.218 (0.151, 0.2995)	0.246 (0.193, 0.2965)	0.242 (0.188, 0.297)	0.202 (0.254, 0.142)	0.211 (0.127, 0.2895)
Testosterone	0.832 (0.875, 0.791)	0.792 (0.86, 0.721)	0.848 (0.7945, 0.903)	0.804 (0.7565, 0.8495)	0.81 (0.7645, 0.8565)	0.788 (0.837, 0.7515)	-0.05 (-0.1175, 0.0105)
DHEA	0.833 (0.872, 0.7925)	0.792 (0.86, 0.7235)	0.839 (0.789, 0.901)	0.811 (0.7605, 0.85)	0.817 (0.769, 0.856)	0.802 (0.839, 0.7585)	-0.051 (-0.1185, 0.021)
Estradiol	0.673 (0.7265, 0.6175)	0.648 (0.7275, 0.5605)	0.685 (0.6095, 0.7595)	0.64 (0.568, 0.6945)	0.646 (0.5775, 0.706)	0.683 (0.7345, 0.631)	-0.25 (-0.331, -0.167)
BMIZ				0.316 (0.258, 0.373)	0.32 (0.257, 0.3835)	0.252 (0.311, 0.1915)	
Income					-0.026 (-0.083, 0.022)	0 (0.0435, 0)	
Parent Education					-0.134 (-0.19, -0.0805)	0 (0, -0.03)	
White Non-Hispanic						0 (0, 0)	
Black						0 (0, 0)	
Hispanic						0 (0, 0)	
Asian						0 (0, 0)	
Other						0 (0, 0)	

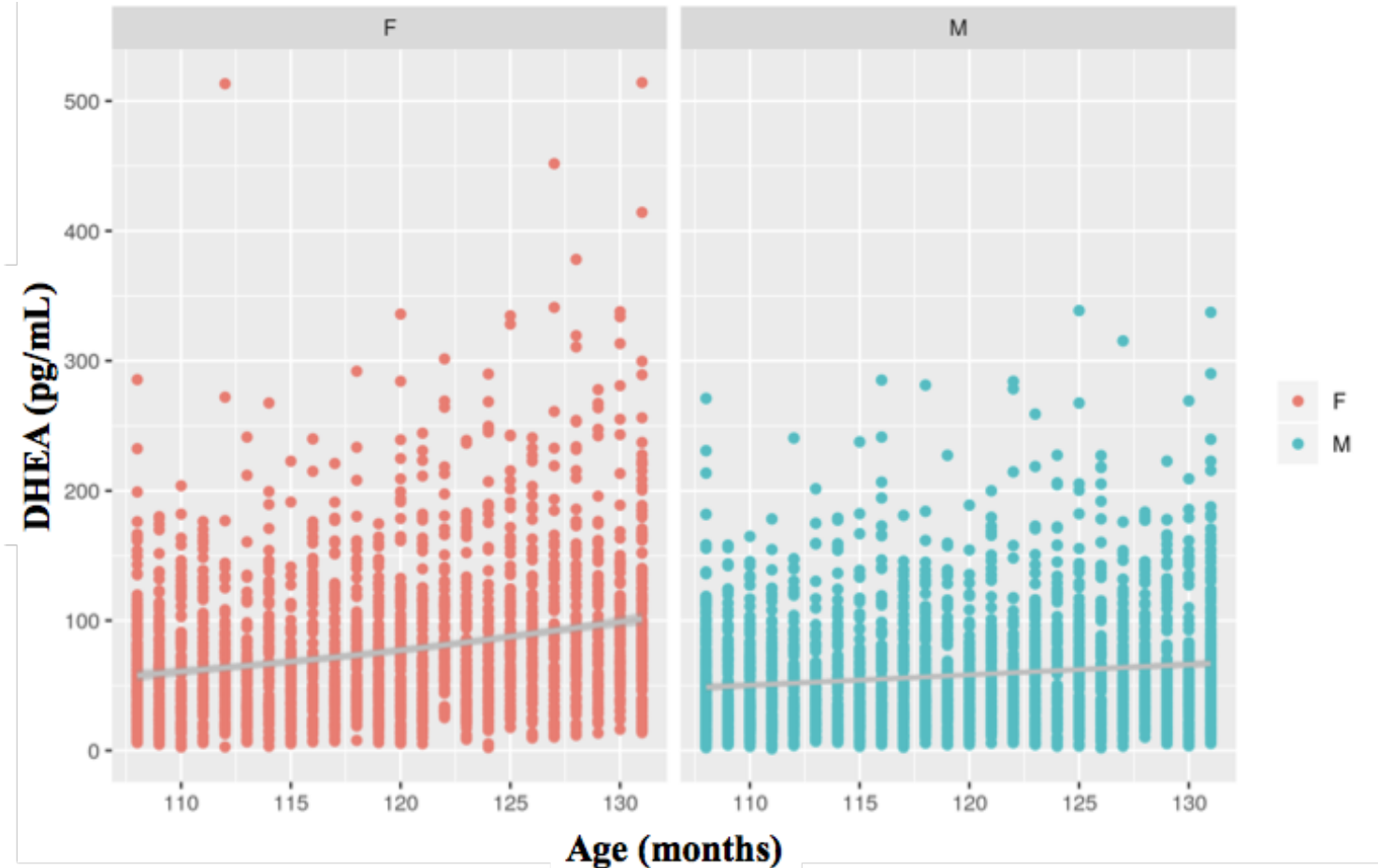
Supplementary Table 11.

Latent factor 2 median loadings and 95% CI for females.

	Robust GFA: PDS & Hormones Only	Robust GFA: Split Half 1	Robust GFA: Split Half 2	Robust GFA: BMlz	Robust GFA: BMlz+SES	Robust GFA: BMlz+SES+ Race/Ethnicity	Robust GFA: Residuals (covariates: age + race/ethnicity + BMI + SES + site)
Height	0.468 (0.53, 0.412)	0.418 (0.5075, 0.3265)	0.504 (0.582, 0.429)	0.446 (0.388, 0.509)	0.459 (0.4005, 0.516)	0.457 (0.5195, 0.391)	0.114 (0.177, 0.0475)
Body Hair	0.552 (0.6055, 0.5045)	0.532 (0.6035, 0.445)	0.556 (0.6295, 0.4855)	0.497 (0.4415, 0.5515)	0.502 (0.443, 0.5545)	0.49 (0.546, 0.44)	0.26 (0.329, 0.194)
Skin	0.52 (0.5725, 0.462)	0.496 (0.578, 0.413)	0.528 (0.598, 0.461)	0.472 (0.412, 0.5245)	0.468 (0.3965, 0.5215)	0.506 (0.5605, 0.45)	0.261 (0.332, 0.193)
Breast	0.528 (0.5795, 0.4775)	0.52 (0.6015, 0.436)	0.525 (0.598, 0.452)	0.53 (0.467, 0.577)	0.532 (0.4795, 0.593)	0.546 (0.5985, 0.4955)	0.198 (0.267, 0.1305)
Menstruation	0.255 (0.3175, 0.181)	0.234 (0.3405, 0.1185)	0.264 (0.3715, 0.16)	0.223 (0.155, 0.297)	0.232 (0.1555, 0.301)	0.238 (0.32, 0.174)	0.129 (0.182, 0.0775)
Testosterone	-0.13 (-0.059, -0.2015)	-0.22 (-0.119, -0.3165)	-0.095 (-0.0065, -0.1985)	-0.25 (-0.319, -0.1735)	-0.238 (-0.307, -0.1645)	-0.19 (-0.1295, -0.2545)	0.826 (0.866, 0.7885)
DHEA	-0.096 (-0.024, -0.165)	-0.208 (-0.109, -0.3025)	-0.042 (0.0475, -0.138)	-0.211 (-0.2645, -0.139)	-0.192 (-0.2685, -0.116)	-0.142 (-0.079, -0.2115)	0.819 (0.861, 0.7735)
Estradiol	-0.388 (-0.3175, -0.4515)	-0.31 (-0.234, -0.4085)	-0.396 (-0.3045, -0.489)	-0.403 (-0.4865, -0.3325)	-0.396 (-0.4815, -0.312)	-0.314 (-0.249, -0.3975)	0.695 (0.7435, 0.643)
BMlz				0.37 (0.301, 0.439)	0.397 (0.329, 0.471)	0.382 (0.459, 0.316)	
Income					-0.15 (-0.211, -0.0915)	-0.086 (-0.038, -0.149)	
Parent Education					-0.242 (-0.2975, -0.182)	-0.132 (-0.0845, -0.185)	
White Non-Hispanic						0 (0, 0)	
Black						0 (0, 0)	
Hispanic						0 (0, 0)	
Asian						0 (0, 0)	
Other						0 (0, 0)	

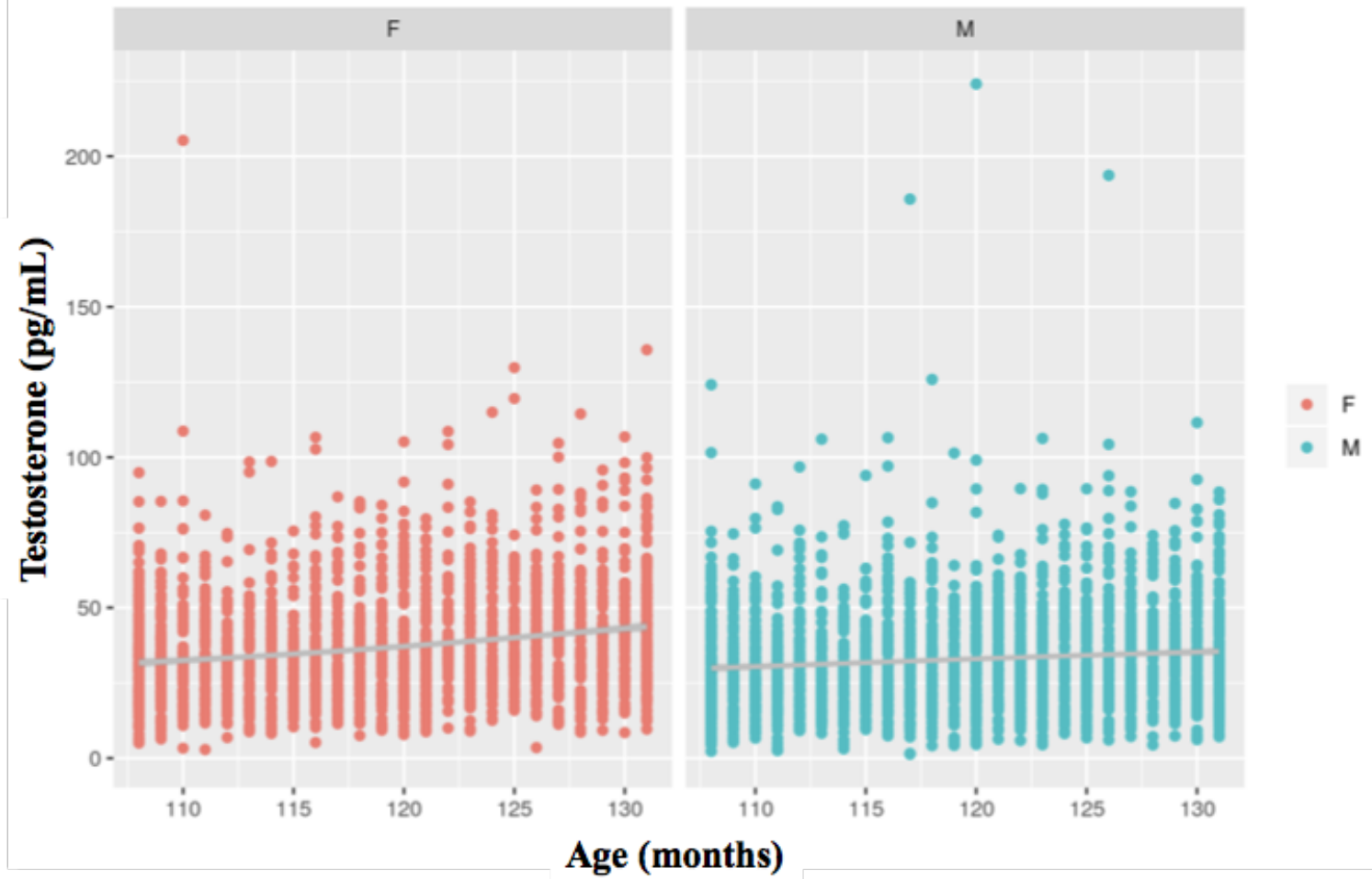
Supplementary Figure 1.

DHEA and age associations in females (F) and males (M).



Supplementary Figure 2.

Testosterone and age associations in females (F) and males (M).



Supplementary Figure 3.

Estradiol and age associations in females (F) only.

