

Supplementary Table I. Comparisons between full and reduced bivariate models. Parameter

estimates from models estimating either non-additive genetic (*D*) or shared environmental (*C*) variance, in addition to the additive genetic (*A*) and non-shared environmental (*E*) variance components of the base model. Chi-squared tests ($df = 6$) of the AE model's decrement in fit to the data, relative to ADE and ACE models, indicate that the reduced model fits as well as either of the two full models ($p \gg .05$). Subscript 'F' indicates female variance components, subscript 'M' those for males; R_G is the genetic correlation between opposite-sex relatives.

Model	Parameter Estimates						
ADE	A_F	D_F	E_F	A_M	D_M	E_M	R_G
<i>Attractiveness</i>	.63	<.01	.37	.63	.07	.30	.92
<i>Masculinity</i>	.50	<.01	.50	.27	.27	.46	1.0
<i>Attractiveness—Masc-fem</i>	-.48	<.01	-.17	-.21	.13	-.08	-1.0 ^a -1.0 ^b
Comparison to AE model: $\chi^2(6) = 3.45, p = .75$							
ACE	A_F	C_F	E_F	A_M	C_M	E_M	R_G
<i>Attractiveness</i>	.46	.16	.37	.68	.03	.30	1.0
<i>Masculinity</i>	.49	.01	.50	.50	<.01	.50	1.0
<i>Attractiveness—Masc-fem</i>	-.45	-.04	-.17	-.07	<.01	-.07	-1.0 ^a -1.0 ^b
Comparison to AE model: $\chi^2(6) = 2.70, p = .85$							

Note: ^a genetic correlation between male *Attractiveness* and female *Masculinity-femininity*.
^b genetic correlation between female *Attractiveness* and male *Masculinity-femininity*.

Supplementary Table II. Genetic and environmental variance-covariance estimates for *Smiling, Acne, Grooming, Masculinity-femininity, and Attractiveness*. A) Parameter estimates from the ACE model estimating additive genetic, shared environmental, and non-shared environmental variance components. B) Estimates from the ADE model estimating additive genetic, non-additive genetic, and non-shared environmental variance components. Separately for each sex, the genetic and environmental correlations (above the main diagonal) and the path coefficients from the Cholesky decomposition of genetic and environmental covariance matrices are shown. Statistically significant estimates ($p < 0.05$) are in bold print.

Supplementary Table 2, comment: Heritability estimates for *Smiling, Acne, Grooming, Masculinity-femininity, and Attractiveness* are not given but can be calculated from the path coefficients. In both the ACE and the ADE model, in both sexes, *Attractiveness* is significantly correlated with *Grooming* through additive genetic factors. In females only, in both models, there are significant additive genetic correlations between *Attractiveness* and *Acne*. In the ACE model, female *Masculinity-femininity* shows additive genetic correlations with both *Acne* and *Grooming*. No significant shared environmental or non-additive genetic correlations are found among traits, but significant non-shared environmental (residual) correlations are found, particularly in females.

In both the ACE and the ADE model, the estimated path coefficients suggest that all, or nearly all, of the genetic effects influencing female *Attractiveness* and *Masculinity-femininity* are indirect, acting through those traits' genetic overlap with other dimensions of facial appearance, particularly *Acne* and *Grooming*. In the ADE model, path estimates suggest that all of the genetic effects (both additive and non-additive) influencing male *Attractiveness* and *Masculinity-femininity* act through their genetic overlap with *Smiling, Acne, and Grooming*.

By Akaike Information Criterion comparison, the ACE model (AIC = 2512.52) fit the data better than the ADE model (AIC = 2523.02, $AIC = 10.5$). Chi-squared tests showed that both C and D variance components could be eliminated from models without significantly

reducing goodness of fit (test of shared environmental variance: $\chi^2(30) = 22.51, p = 0.83$; test of non-additive genetic variance: $\chi^2(30) = 12.0, p < 0.99$).

A. ACE Models

Females

Additive genetic factor					
	1	2	3	4	5
1. Smiling	0.33	-0.17	0.53	0.25	-0.12
2. Acne	-0.12	0.69	-0.53	0.46	-0.56
3. Grooming	0.28	-0.23	0.38	-0.69	0.78
4. Masculinity-femininity	0.16	0.32	-0.52	<0.01	-0.99
5. Attractiveness	-0.07	-0.36	0.49	<0.01	<0.01

Shared environmental factor					
	1	2	3	4	5
1. Smiling	0.49	0.03	-0.20	-0.66	0.34
2. Acne	0.01	0.40	-0.35	0.26	-0.48
3. Grooming	-0.09	-0.16	0.42	-0.60	0.62
4. Masculinity-femininity	-0.21	0.09	-0.22	0.01	-0.75
5. Attractiveness	0.17	-0.25	0.28	0.26	0.11

Non-shared environmental factor					
	1	2	3	4	5
1. Smiling	0.80	0.09	0.06	-0.14	0.09
2. Acne	0.05	0.58	-0.25	0.10	-0.29
3. Grooming	0.05	-0.18	0.69	-0.30	0.39
4. Masculinity-femininity	-0.10	0.08	-0.19	0.67	-0.56
5. Attractiveness	0.05	-0.18	0.19	-0.27	0.47

Males

Additive genetic factor					
	1	2	3	4	5
1. Smiling	0.47	0.33	-0.94	-0.03	-0.28
2. Acne	0.21	0.60	-0.57	0.03	-0.33
3. Grooming	-0.27	-0.08	0.06	0.11	0.51
4. Masculinity-femininity	-0.02	0.03	0.27	0.61	0.05
5. Attractiveness	-0.19	-0.17	0.57	-0.22	0.11

Shared environmental factor					
	1	2	3	4	5
1. Smiling	0.37	-0.48	0.96	-0.48	1.0
2. Acne	-0.20	0.36	-0.21	1.0	-0.55
3. Grooming	0.53	0.16	<0.01	-0.22	0.93

4. Masculinity-femininity	<0.01	0.01	<0.01	<0.01	-0.55
5. Attractiveness	0.36	-0.03	<0.01	<0.01	<0.01

Non-shared environmental factor

	1	2	3	4	5
1. Smiling	0.80	-0.06	<0.01	0.03	0.05
2. Acne	-0.04	0.66	-0.02	0.22	-0.22
3. Grooming	<0.01	-0.02	0.78	-0.03	0.25
4. Masculinity-femininity	0.02	0.17	-0.02	0.72	-0.11
5. Attractiveness	0.03	-0.14	0.16	-0.04	0.61

B. ADE Models

Females

Additive genetic factor

	1	2	3	4	5
1. Smiling	0.54	-0.12	0.08	-0.58	0.37
2. Acne	-0.10	0.81	-0.46	0.45	-0.53
3. Grooming	0.06	-0.32	0.63	-0.84	0.77
4. Masculinity-femininity	-0.33	0.22	-0.40	0.11	-0.90
5. Attractiveness	0.28	-0.37	0.44	-0.40	<0.01

Non-additive genetic factor

	1	2	3	4	5
1. Smiling	0.29	1.0	1.0	1.0	-1.0
2. Acne	0.06	<0.01	1.0	1.0	-1.0
3. Grooming	0.06	<0.01	<0.01	1.0	-1.0
4. Masculinity-femininity	0.44	<0.01	<0.01	<0.01	-1.0
5. Attractiveness	-0.28	<0.01	<0.01	<0.01	<0.01

Non-shared environmental factor

	1	2	3	4	5
1. Smiling	0.79	0.09	0.07	-0.15	0.08
2. Acne	0.05	0.58	-0.25	0.10	-0.29
3. Grooming	0.05	-0.18	0.68	-0.31	0.39
4. Masculinity-femininity	-0.10	0.08	-0.20	0.66	-0.56
5. Attractiveness	0.05	-0.18	0.19	-0.27	0.46

Males

Additive genetic factor

	1	2	3	4	5
1. Smiling	0.36	-0.28	0.93	-0.28	0.97
2. Acne	-0.21	0.71	-0.23	-0.50	-0.50
3. Grooming	0.55	0.02	0.22	-0.01	0.85

<i>4. Masculinity-femininity</i>	-0.03	-0.06	0.08	<0.01	-0.21
<i>5. Attractiveness</i>	0.56	-0.13	-0.06	<0.01	<0.01

Non-additive genetic factor

	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>1. Smiling</i>	0.53	0.82	-0.86	-0.03	-0.59
<i>2. Acne</i>	0.17	0.12	-0.87	0.42	-0.18
<i>3. Grooming</i>	-0.25	-0.08	0.12	0.07	0.11
<i>4. Masculinity-femininity</i>	-0.02	0.54	0.43	<0.01	0.07
<i>5. Attractiveness</i>	-0.31	0.29	-0.32	<0.01	<0.01

Non-shared environmental factor

	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>1. Smiling</i>	0.76	-0.06	0.01	0.05	0.07
<i>2. Acne</i>	-0.04	0.64	-0.01	0.22	-0.21
<i>3. Grooming</i>	<0.01	-0.01	0.75	-0.03	0.22
<i>4. Masculinity-femininity</i>	0.03	0.16	-0.02	0.69	-0.11
<i>5. Attractiveness</i>	0.05	-0.13	0.13	-0.04	0.59