Supporting Information

Alvergne et al. 10.1073/pnas.1001752107

SI Materials and Methods

Ultimate reproductive success was defined as the product of the number of children times the mean survival of children to age 5, given their deviation from standard body mass index (BMI). To obtain the variable describing deviation from standard BMI in the studied population (i.e., BMI_{dev}), we extracted the part of BMI variation not explained by demographic variables [i.e. residuals of a GLM where log (BMI) was taken as a response variable; age, squared age, sex, and social class as dependent variables]. To ensure that our variable was realistic, we compared it to a variable describing deviation from standard BMIs from the World Health Organization (http://www.who.int). These standards are based on children from diverse ethnic backgrounds and cultural settings and can therefore apply to any country. The two variables are strongly correlated (Pearson's correlation test $r = 0.78$, $P < 0.001$), indicating that BMI_{dev} is a good predictor of the deviation from standard BMI in the studied population.

We then translated BMI_{dev} into a chance to survive until the age of 5, assuming this relationship to be lower than expected from previous research (1) because the mortality rate has decreased in Senegal from 1990 to 2007 (1990: 149 for 1000; 2007: 111 deaths for 1000). We also assumed a nonlinear relationship, the link between BMI_{dev} and child survival being higher for negative than for positive deviations. Finally, we assumed that the survival rate corresponding to the mean BMI_{dev} deviation in our population equals the standard survival rate in the general population (i.e., 89%), with a minimum survival chance of ~50% (see Eq. **S1** and Fig. S2).

Finally, ultimate reproductive success for each woman was calculated as the product of the mean chance of surviving to age 5 for all of her children times the number of her children. A model was then run, in which ultimate reproductive success was considered as the response variable, and neuroticism, squared neuroticism, and mother's age were introduced as fixed effects.

$$\text{survival chance to age } 5 = 1 - (\text{Exp}(-\text{BMI}_{dev} * a)/a) \quad \textbf{[S1]}$$

with $a = 6.7$ (given the survival rate corresponding to the mean BMI_{dev} is assumed to equal 0.89).

1. Rosetta L, O'Quigley J (1990) Mortality among Serere children in Senegal. *Am J Hum Biol* 2:719–726.

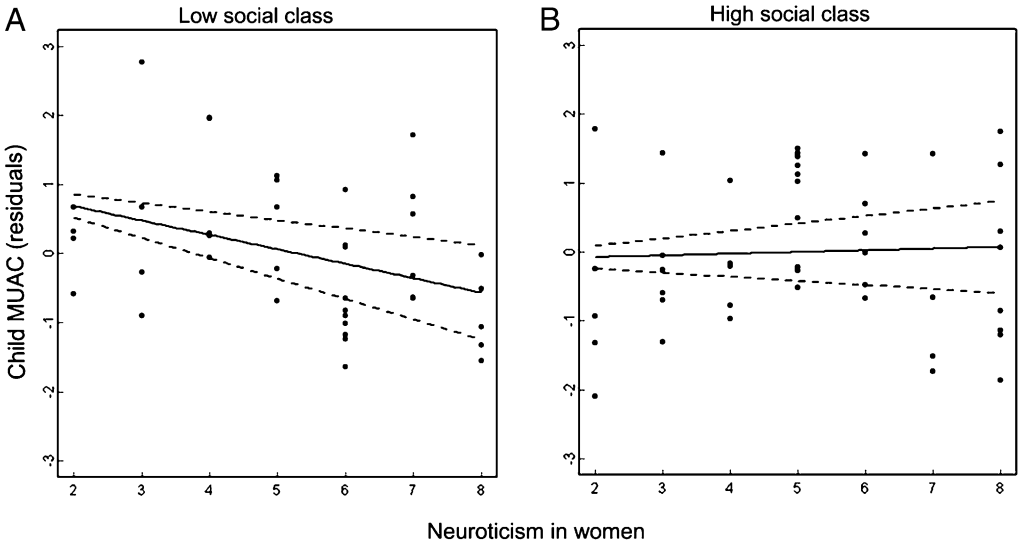

Fig. S1. Women's neuroticism is associated with a reduction in child's physical condition at ages 0–5 y in low but not in high social classes. (*A*) Child mid-upper arm circumference (MUAC) and low social class (*n* mothers = 41). (*B*) Child MUAC and high social class (*n* mothers = 33).

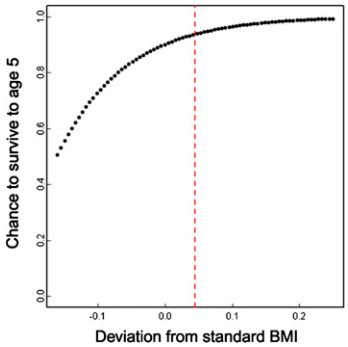

Fig. S2. Child survival to age 5 as a function of his or her BMI. The variable labeled "deviation from standard BMI" corresponds to the residuals of a GLM in which the log of child BMI is the response variable; child's age, squared age, sex, and social class are included as dependent variables. The red dashed line corresponds to the mean deviation from standard BMI in our sample (see *SI Materials and Methods* for details).

Table S1. Final models on personality traits and reproductive success for both women and men

Independent variable	Dependent variables (women)	Estimate	SE	df	*t*-value	Pr(>|*t*|)
Women's no.of children	Intercept	−1.78	1.26	65		0.16
	Age	0.19	0.03	65	6.40	**<0.001**
	Neuroticism	0.25	0.11	65	2.37	**0.02**
	Extraversion	0.00	0.13	65	0.00	0.99
	r1	−0.45	0.50	65	−0.90	0.37
	r2	−1.43	0.54	65	−2.66	**<0.01**
Independent variable	Dependent variables (men)	Estimate	SE		*z*-value	Pr(>|*z*|)
Men's social class	Intercept	0.66	2.29		0.29	0.77
	Age	0.01	0.04		0.18	0.86
	Extraversion	0.57	0.22		2.60	**0.01**
	Neuroticism	−0.36	0.18		−2.00	**0.05**
	Agreeableness	0.13	0.19		−0.68	0.50
	Openness	0.03	0.14		0.24	0.81
	Serere	0.98	0.70		1.39	0.17
	Wolof	−0.84	0.92		−0.92	0.36
Men's marital status	Intercept	−2.63	2.38		−1.10	0.27
	Age	0.04	0.04		1.08	0.28
	Extraversion	0.51	0.20		2.52	**0.01**
	Neuroticism	−0.30	0.18		−1.63	0.10
	Agreeableness	−0.10	0.21		0.49	0.62
	Openness	0.07	0.13		0.56	0.57
Independent variable	Dependent variables (men)	Estimate	SE		*t*-value	
Men's no. of children	Intercept	0.91	0.32		2.85	
	Age	0.03	0.00		5.57	
	Extraversion	0.06	0.03		2.20	
	Agreeableness	−0.01	0.02		0.41	
	Openness	−0.00	0.02		−0.24	
	Neuroticism	−0.02	0.03		−1.17	

Mixed models were performed (with "village" as a random effect). Reponse variables were, successively, the following: women's number of children (normal error structure), men's marital status (binomial error structure: 0, monogamous; 1, polygamous), men's social class (binomial error structure: 0, low social class; 1, high social class), and men's number of children (quasi-Poisson error structure). r1: The variation of the effect of the second modality of women's rank (first wife) as compared with the first modality (i.e., intercept, monogamous wives). r2: The variation of the effect of the third modality of women's rank (second wife) as compared with the first modality (i.e., intercept, monogamous wives).

Table S2. Final models for child condition between 0 and 5 y and parents' personalities

Independent variable	Dependent variables	Estimate	SE	df	*t*-value	Pr(>|*t*|)
Child MUAC in low social class	Intercept	15.23	0.63	31		
	Child age	0.20	0.12	31	1.72	0.09
	Neuroticism (mother)	−0.20	0.08	31	−2.44	0.02
	Extraversion (father)	0.04	0.11	31	0.37	0.71
Child MUAC in high social class	Intercept	13.90	0.69	39		
	Child age	0.31	0.12	39	2.57	0.01
	Neuroticism (mother)	−0.05	0.10	39	−0.48	0.63
	Extraversion (father)	−0.12	0.15	39	−0.80	0.42
Child BMI in low social class	Intercept	20.27	1.24	31		
	Child age	−0.65	0.25	31	−2.58	0.01
	Child sex*	0.20	0.69	31	0.29	0.77
	Neuroticism (mother)	−0.39	0.18	31	−2.16	0.04
	Extraversion (father)	0.07	0.23	31	0.32	0.75
Child BMI in high social class	Intercept	16.85	1.20	34		
	Child age	−0.15	0.24	34	−0.63	0.53
	Child sex*	−1.84	0.60	34	−3.06	<0.01
	Neuroticism (mother)	−0.10	0.17	34	−0.58	0.57
	Extraversion (father)	−0.29	0.25	34	−1.16	0.25

Linear mixed models were performed (village as a random effect). Reponses variables (MUAC and BMI) were log-transformed. A weighting factor accounting for the number of children per woman was included.
*The variation of the effect of the second modality of sex (girl) compared with the first one (i.e., intercept, boy).

Table S3. Repartition of ethnic groups, social classes and marital status across villages

	Village 1	Village 2	Village 3	Village 4	Mean no. of children ± SD
Wolof	0	1	6	7	8.21 ± 4.54
Serere	15	3	4	3	8.40 ± 3.49
Others ethnical groups	0	15	3	8	6.38 ± 2.10
Polygynous	3	7	8	9	9.26 ± 3.90
Monogamous	12	12	5	9	6.34 ± 2.33
High social class	9	7	6	6	8.71 ± 3.76
Low social class	6	12	7	12	6.68 ± 2.80
Mean no. of children ± SD	8.73 ± 3.26	6.47 ± 2.06	8.85 ± 4.45	6.77 ± 3.35	

Table S4. Assessment of personality dimensions in both men and women

Dimension	Adjectives	α Cronbach	Range	Mean ± SD
Extraversion				
Men	Talkative/quiet	1.01	−3 to 3	−0.26 ± 1.64
Women	Talkative/quiet	0.63	−3 to 3	−0.28 ± 1.69
Conscientiousness				
Men	Systematic/elegant/tidy	0.67	3–12	11.34 ± 1.38
Women	Systematic/elegant/tidy	0.60	3–12	11.28 ± 1.40
Agreeableness				
Men	Unkind/rude/impulsive	0.75	3–12	4.03 ± 1.61
Women	Unkind/rude/impulsive	0.50	3–12	4.43 ± 2.03
Openness				
Men	Creative/artistic/intellectual/deep	0.62	4–16	13.97 ± 2.34
Women	Intellectual/deep	0.50	2–8	6.55 ± 1.60
Neuroticism				
Men	Anxious/moody	0.64	2–8	3.82 ± 1.90
Women	Anxious/sensitive	0.52	2–8	5.32 ± 1.91