Supporting Information

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SI Methods

Maternal, Birth, and Infancy Measures. Weight was measured by birth attendants or trained interviewers at birth and at bimonthly intervals during the first 2 y of life (1984–1986) (1). Gestational age at birth was estimated from the date of the mother's last menstrual period recorded at the baseline survey. Trained nurses performed Ballard clinical assessments if pregnancy complications occurred or if the infant birth weight was lower than 2.5 kg. Fetal growth rate was calculated as residuals of birth size adjusted for gestational age at birth. Six-month weight velocities were calculated as weight change divided by days elapsed between measurements. Women answered questions about assets, education, income, breastfeeding practices, and educational attainment. Interviewers measured anthropometric indicators (height, weight, triceps skinfold thickness) and evaluated variables relating to cleanliness within the household. During each bimonthly follow-up, women were asked about infant feeding practices and whether their child had experienced symptoms of diarrhea during the past week.

Adult Anthropometry. Body weight, height, mid–upper arm circumference, and skinfold thicknesses (triceps, subscapular, suprailiac) were measured using standard techniques (2). Body mass index was calculated as weight (in kg) divided by the square of height (in m). Grip strength was measured in triplicate to the closest kilogram with a dynamometer, with the average used in analyses. Percent body fat was calculated from body density estimates based on triceps, suprailiac, and subscapular skinfold thicknesses (3). Upper arm muscle area (cm^2) was estimated from arm circumference and triceps skinfolds, adjusting for area of humerus (4).

SI Results

Multiple regression models evaluating relationships between early weight velocities and biomarkers of testicular function are presented in Table S1. Models predicting maturational status are reported in Table S2, while those predicting adult height, lean mass, body composition, and strength are reported in Table S3. To evaluate whether associations are specific to male subjects, we ran comparable models predicting adult height, lean mass, body composition, and strength, limited to the 655 female subjects with all necessary data who were not currently pregnant (Table S4).

In 1998 or 1999, male subjects provided a self-administered maturational status assessment by comparing their pubic hair development to five pictures representing different stages of pubertal development. We used logistic regression to model the likelihood of being a "fast maturer" at the time of maturity assessment, defined as being in either of the two most mature pubic hair stages (PH4 or PH5), corresponding to the most mature 40% of the sample. B6M weight velocity was the strongest predictor of being relatively more mature at the age of maturity assessment (Table S2). To evaluate whether similar relationships are present in female subjects, we defined "fast maturer" as the earliest-maturing 40% of the female cohort based upon menarcheal age, which was modeled using logistic regression adjusted for household income in adolescence. In contrast to the findings in male subjects, early maturity in female subjects was not related to B6M weight velocity, but was instead more strongly related to late infancy and early childhood weight velocities (Table S2).

We next modeled the predictors of the age of first sex assessed at the age of the follow-up survey when hormones and other outcomes were measured. Because 249 of the participants (33.4%) reported never having had sex in the past, we used survival time hazard regression (Weibull distribution) to model this relationship (Table S5). Of the weight velocities considered, only B6M weight velocity was a significant predictor of an earlier age at first sex in this sample of men.

We next modeled the predictors of the number of lifetime sex partners that each participant reported having. The count data were overdispersed, requiring the use of negative binomial regression in place of Poisson. There were significant, positive relationships between number of lifetime sex partners and weight velocities measured from birth to 6 mo, 6 to 12 mo, and 18 to 24 mo of age (Table S6). The strongest relationship was with B6M weight velocity. We next evaluated the same model after adjusting for maturational tempo. We did this by including pubic hair stage, age at pubic hair assessment, and a pubic hair × age multiplicative interaction term to the model. This approach accounted for whether men were maturationally advanced or delayed relative to other cohort males who had pubic hair assessments conducted at the same age. Consistent with the hypothesis that earlier maturity is in the pathway linking early fast weight gain with more adult sex partners, all of the coefficients were attenuated after adjusting for maturational tempo, although both B6M and 6 to 12 mo weight velocities remained significant as predictors in this model.

Because fast early growers have more lifetime sex partners even after adjusting for maturational tempo, we next tested whether they showed signs of being more sexually active generally. Among the subset of men who had already reported being sexually active ($n = 521$), we used a logistic regression to model the predictors of reporting having had sex in the past month, adjusting for current relationship status and other potential confounding influences (Table S7). Weight velocity from birth to 6 mo was the only significant predictor (positive) of recent sexual activity in the sample.

If early-life weight velocities correlate with subsequent environmental characteristics, this could confound the associations we document here. We evaluated this using two socioeconomic measures of household environmental quality that have been shown to be robust predictors of variation in growth rate, diet, and other characteristics in this sample: household income and a scale reflecting household possession of 10 important assets. Fig. S1 reports partial correlation coefficients generated by including birth weight and all early-life weight velocities in multiple regression models predicting each measure of household income or assets (sample sizes ranged from 758 to 770 for all models). Although our analyses here reveal B6M weight velocity to generally be the strongest predictor of adult maturational, hormonal, and somatic outcomes, it was a comparably weak correlate of future household quality and resources as indicated by wealth and assets.

1. Popkin BM, et al. (1990) Breast-feeding and diarrheal morbidity. *Pediatrics* 86:874–882.
2. Lohman TG, Roche AF, Martorell R (1988) *Anthropometric Standardization Reference Manual* (Human Kinetics Books, Champaign, IL).
3. Durnin JV, Womersley J (1974) Body fat assessed from total body density and its estimation from skinfold thickness: Measurements on 481 men and women aged from 16 to 72 years. *Br J Nutr* 32:77–97.
4. Frisancho AR (1990) *Anthropometric Standards for the Assessment of Growth and Nutritional Status* (Univ Michigan Press, Ann Arbor, MI).

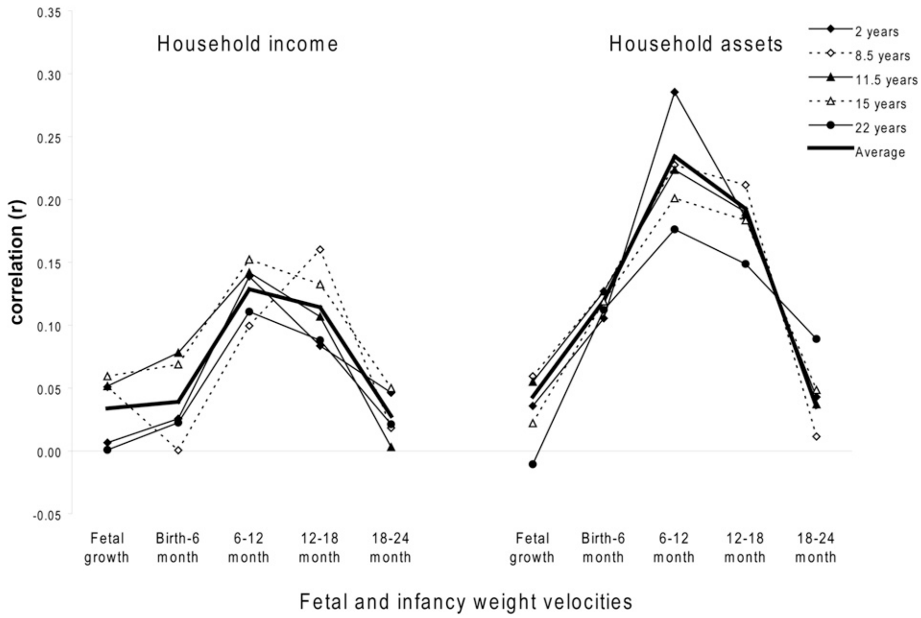

Fig. S1. Correlations between birth weight and infancy weight velocities and household income and assets measured in male participants' households across their life course.

Table S1. Multiple regression models relating early-life weight velocities to adult biomarkers of testicular function (*N* = 770)

	Salivary waking T, log pg/mL		Salivary evening T, log pg/mL*		Plasma LH, mIU/mL		Plasma FSH, log mIU/mL	
Variable	β (95% CI)	*P* value	β (95% CI)	*P* value	β (95% CI)	*P* value	β (95% CI)	*P* value
Birth weight	0.01 (−0.02, 0.04)	0.659	0.01 (−0.03, 0.04)	0.709	−0.03 (−0.36, 0.29)	0.839	−0.01 (−0.04, 0.03)	0.707
Birth to 6 mo	0.04 (0.01, 0.07)	0.013	0.004 (−0.03, 0.04)	0.789	−0.31 (−0.63, 0.02)	0.065	−0.03 (−0.07, 0.001)	0.055
6–12 mo	0.01 (−0.02, 0.04)	0.674	0.01 (−0.02, 0.04)	0.520	−0.29 (−0.62, 0.04)	0.084	−0.02 (−0.05, 0.02)	0.290
12–18 mo	0.003 (−0.03, 0.03)	0.840	−0.02 (−0.05, 0.02)	0.352	−0.26 (−0.60, 0.08)	0.129	−0.005 (−0.04, 0.03)	0.800
18–24 mo	−0.01 (−0.04, 0.02)	0.585	0.0002 (−0.03, 0.03)	0.991	−0.14 (−0.49, 0.20)	0.416	0.004 (−0.03, 0.04)	0.844
Model R^2	0.035		0.059		0.045		0.014	

All values adjusted for time of saliva or blood collection, wake time, age, adult household income, and fatherhood status. T, testosterone.
**n* = 762.

Table S2. Logistic regression models predicting being in the most mature pubic hair stages (PH4/PH5) at 15 to 16 y of age in male subjects (40% of sample) or among the fastest maturing 40% of the female cohort based on menarcheal age

	Males (*n* = 746)		Females (*n* = 744)	
Variable	Odds ratio (95% CI)	*P* value	Odds ratio (95% CI)	*P* value
Birth weight	1.34 (1.15, 1.58)	0.0001	0.97 (0.83, 1.14)	0.717
Birth to 6 mo	1.52 (1.29, 1.78)	0.0001	1.14 (0.98, 1.33)	0.092
6–12 mo	1.10 (0.94, 1.30)	0.226	1.50 (1.27, 1.77)	0.0001
12–18 mo	1.12 (0.95, 1.32)	0.164	1.37 (1.16, 1.61)	0.0001
18–24 mo	0.99 (0.84, 1.17)	0.918	1.38 (1.17, 1.62)	0.0001
R^2	0.081		0.061	

Values adjusted for household income during adolescence (male and female) and age of maturational status assessment (male only).

Table S3. Multiple regression models relating early life weight velocities to adult somatic traits in males (*N* = 770)

	Height, cm		Lean mass, kg*		Arm muscle area, cm^2		Grip strength, kg	
Variable	β (95% CI)	*P* value	β (95% CI)	*P* value	β (95% CI)	*P* value	β (95% CI)	*P* value
Birth weight	1.37 (1.00, 1.74)	0.0001	2.00 (1.48, 2.53)	0.0001	1.04 (0.51, 1.58)	0.0001	1.66 (0.03, 3.28)	0.046
Birth to 6 mo	2.33 (1.96, 2.70)	0.0001	3.39 (2.86, 3.92)	0.0001	1.33 (0.80, 1.86)	0.0001	1.64 (0.02, 3.26)	0.047
6–12 mo	1.09 (0.72, 1.46)	0.0001	2.93 (2.41, 3.46)	0.0001	1.43 (0.90, 1.97)	0.0001	1.81 (0.20, 3.43)	0.028
12–18 mo	1.08 (0.70, 1.47)	0.0001	2.12 (1.57, 2.66)	0.0001	0.76 (0.21, 1.31)	0.007	1.20 (−0.48, 2.88)	0.162
18–24 mo	0.89 (0.50, 1.28)	0.0001	0.80 (0.25, 1.36)	0.005	0.12 (−0.44, 0.68)	0.672	0.17 (−1.55, 1.88)	0.849
Model R^2	0.250		0.327		0.099		0.032	

All values adjusted for adult household income and age; all but height also adjusted for physically demanding work, basketball playing, weightlifting.

**n* = 762.

Table S4. Multiple regression models relating early life weight velocities to adult somatic traits in female subjects (*N* = 655)

	Height, cm		Lean mass, kg		Arm muscle area, cm^2		Grip strength, kg	
Variable	β (95% CI)	*P* value	β (95% CI)	*P* value	β (95% CI)	*P* value	β (95% CI)	*P* value
Birth weight	1.64 (1.28, 2.00)	0.0001	1.31 (1.02, 1.61)	0.0001	1.13 (0.57, 1.69)	0.0001	0.09 (−1.19, 1.39)	0.880
Birth to 6 mo	1.84 (1.48, 2.20)	0.0001	1.22 (0.92, 1.52)	0.0001	0.76 (0.20,1.32)	0.007	1.63 (0.34, 2.92)	0.013
6–12 mo	1.17 (0.81, 1.53)	0.0001	0.85 (0.55, 1.15)	0.0001	0.62 (0.06, 1.18)	0.031	2.30 (1.00, 3.60)	0.001
12–18 mo	0.91 (0.55, 1.28)	0.0001	0.63 (0.32, 0.93)	0.0001	0.49 (−0.08 1.06)	0.091	1.44 (0.12, 2.75)	0.032
18–24 mo	0.86 (0.49, 1.24)	0.0001	0.46 (0.15, 0.77)	0.003	0.29 (−0.28, 0.87)	0.317	0.36 (−0.98, 1.69)	0.601
Model R^2	0.273		0.225		0.054		0.051	

Data limited to nonpregnant women. All models adjusted for age and adult household income; all but height also adjusted for physically demanding work and physically demanding household activities.

Table S5. Hazard regression model predicting age at first sexual intercourse in male subjects (*N* = 770)

Variable	Coefficient (95% CI)	*P* value
Birth weight	1.06 (0.98, 1.16)	0.150
Birth to 6 mo	1.12 (1.03, 1.21)	0.006
6–12 mo	1.09 (1.00, 1.20)	0.056
12–18 mo	1.03 (0.94, 1.14)	0.493
18–24 mo	1.08 (0.98, 1.18)	0.125

Weibull distribution; adjusted for urbanicity score, education, and household income.

Table S6. Negative binomial regression model predicting number of lifetime sex partners in male subjects (*N* = 748)

	Base model*		Adjusted for maturational tempo†	
Variable	Rate ratio (95% CI)	*P* value	Rate ratio (95% CI)	*P* value
Birth weight	1.02 (0.92, 1.12)	0.712	0.98 (0.89, 1.09)	0.756
Birth to 6 mo	1.33 (1.19, 1.48)	0.0001	1.24 (1.11, 1.38)	0.0001
6–12 mo	1.20 (1.08, 1.34)	0.001	1.18 (1.06, 1.31)	0.003
12–18 mo	0.99 (0.89, 1.10)	0.863	0.97 (0.87, 1.08)	0.576
18–24 mo	1.13 (1.01, 1.26)	0.032	1.08 (0.97, 1.22)	0.163
R^2	0.026		0.035	

*Values adjusted for age, adult household income, urbanicity score, education, and pair-bond status.

†Adjusted for age, adult household income, urbanicity score, education, pair-bond status, and maturational tempo assessed at age 15–16 y (1998).

Table S7. Logistic regression predicting any sex in past month in males

Variable	Odds ratio (95% CI)	*P* value
Birth weight	1.01 (0.82, 1.24)	0.961
Birth to 6 mo	1.27 (1.04, 1.57)	0.022
6–12 mo	1.17 (0.94, 1.45)	0.156
12–18 mo	1.14 (0.91, 1.43)	0.251
18–24 mo	1.03 (0.82, 1.29)	0.779
R^2	0.236	

Total of 521 men who have ever had sex adjusted for age, education, adult household income, urbanicity score, and current pair-bond status.