SUPPLEMENTARY APPENDIX

Measuring Ideal Family Size

The ideal family size question specifically asked "What number of children do you think is the best number of children for you to have so that you can live well? Think about your experience, life, and wishes. There are no correct or incorrect answers to this question" (Mcallister et al., 2012).

Predicting Ideal Family Size

Ideal family size is predicted for men and women separately using linear regression and is included in the supplementary materials. Independent variables included BMI of mother, a dummy variable indicating presence of one or more sons in the household, age at interview, respondent parity at interview, husband and wife's literacy, husband and wife's Spanish proficiency, partner's IFS, and distance to San Borja. Both husband and wife's literacy and Spanish proficiency are dichotomous variables included to proxy for differential access to information and health care. For both women and men, self-reported parity at interview is highly correlated with age at interview (r=0.85 and 0.75, respectively) resulting in a high degree of multicollinearity in models that include both; therefore, models with both controls are followed by models which exclude age and parity in turn (Tables S1 and S2). The odds of exceeding ideal family size are estimated for men and women separately using logistic regression. The same control variables were included in both linear and logistic regressions, with models including age and parity, then age and parity separately in turn (Table 2).
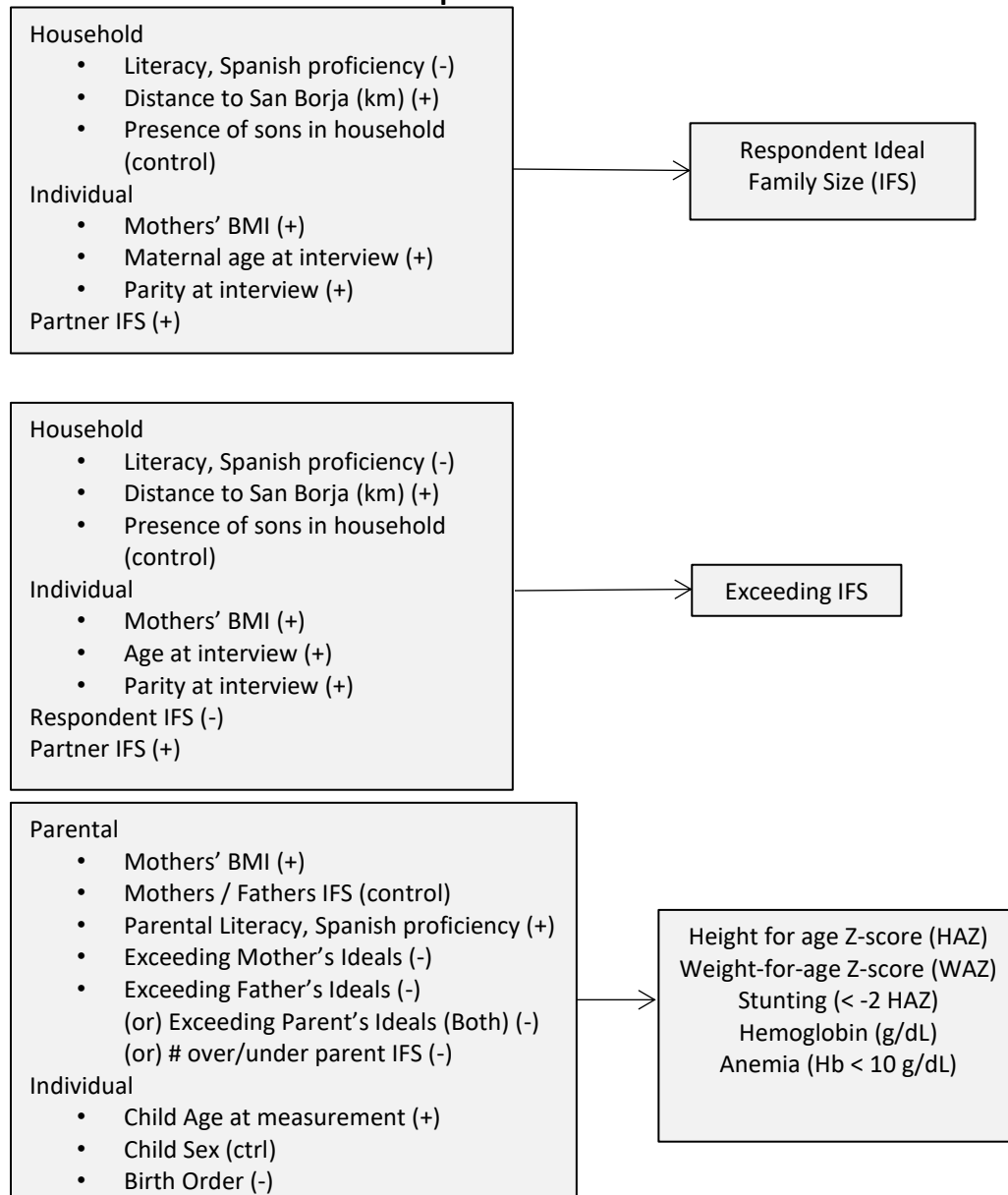
Cohort Shifts in Age-Specific Fertility

There is little evidence that the pattern of age-specific fertility patterns across female cohorts are shifting (n=4,643 reproductive histories, Figure S1). The peak fertility rate is consistent across cohorts at ages 20-24, with no notable compression restricting fertility to a central age range across birth cohorts. Completed fertility is high in this population, ranging from 8.85 children per woman in the 1920 cohort to 9.59 in the 1950 cohort. If fertility remains constant at the age-specific pattern of the 1950 cohort, the 1970, 1980, and 1990 cohorts can expect to have high levels of completed fertility (9.53, 8.84, and 9.93, respectively). Age at first birth and mean inter-birth intervals are not significantly different by maternal birth cohort, with overlapping confidence intervals across cohorts indicating relatively little shift in this pattern (Figure S2).

Cohort Shifts in IFS

Women born from 1980-1990 had mean IFS of 3.6, whereas men born in the same period had mean IFS of 3.8 (Figure 1). The discrepancy between fathers' and mothers' IFS is also declining over birth cohort, however, 95% confidence intervals overlap across all cohorts (Figure 2). IFS is declining over birth cohort, but high fertility and low contraceptive use in this population results in a high correlation coefficient between parity and age (r=0.85 for women and 0.75 for men). This affects modeling strategies and interpretation as well as interpretation of any observed cohort patterns in IFS. It may be the case that cohort membership is associated with lower IFS or that lower parity is associated with lower IFS. If the former is the case, IFS is declining over birth cohorts and we may see some association of exceeding ideals and child nutrition in the face of preference- behavior mismatch. If the latter is the case, it is current parity and not age that influences ideals and thus individuals are more likely to state an IFS similar to their current

parity (or adjust IFS over time). While the parity-IFS convergence scenario may be possible, a trend of declining IFS by birth cohort is possible given increases in schooling and Spanish fluency among younger cohorts.

Figure S1. Conceptual model of hypothesized associations between socioeconomic variables and IFS and child outcomes with predicted directions

Household
- Literacy, Spanish proficiency (-)
- Distance to San Borja (km) (+)
- Presence of sons in household (control)

Individual
- Mothers' BMI (+)
- Maternal age at interview (+)
- Parity at interview (+)

Partner IFS (+)

→ Respondent Ideal Family Size (IFS)

Household
- Literacy, Spanish proficiency (-)
- Distance to San Borja (km) (+)
- Presence of sons in household (control)

Individual
- Mothers' BMI (+)
- Age at interview (+)
- Parity at interview (+)

Respondent IFS (-)
Partner IFS (+)

→ Exceeding IFS

Parental
- Mothers' BMI (+)
- Mothers / Fathers IFS (control)
- Parental Literacy, Spanish proficiency (+)
- Exceeding Mother's Ideals (-)
- Exceeding Father's Ideals (-)
  (or) Exceeding Parent's Ideals (Both) (-)
  (or) # over/under parent IFS (-)

Individual
- Child Age at measurement (+)
- Child Sex (ctrl)
- Birth Order (-)

→ Height for age Z-score (HAZ)
Weight-for-age Z-score (WAZ)
Stunting (< -2 HAZ)
Hemoglobin (g/dL)
Anemia (Hb < 10 g/dL)

Figure S2. Age-Specific Fertility by Birth Cohort (A) and Completed Fertility by Birth Cohort (B), (N= 4,643), Females in the Tsimane Population
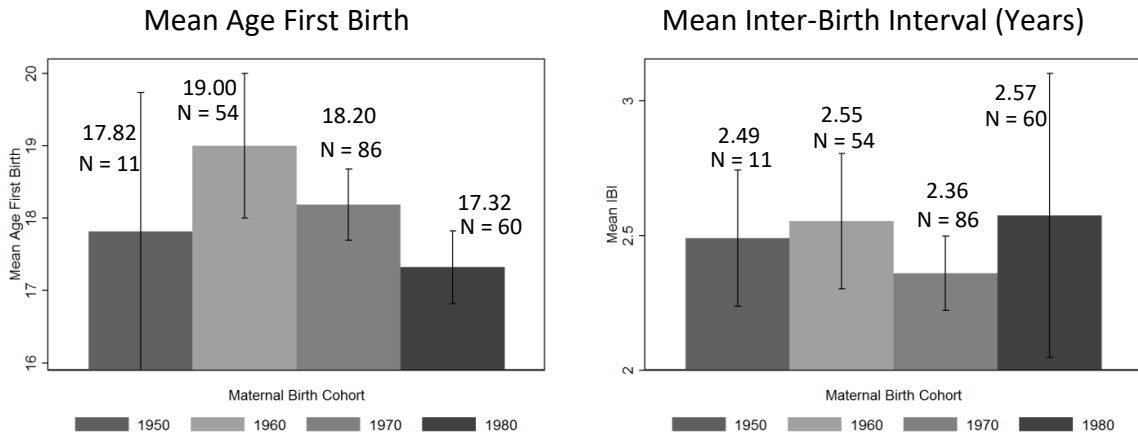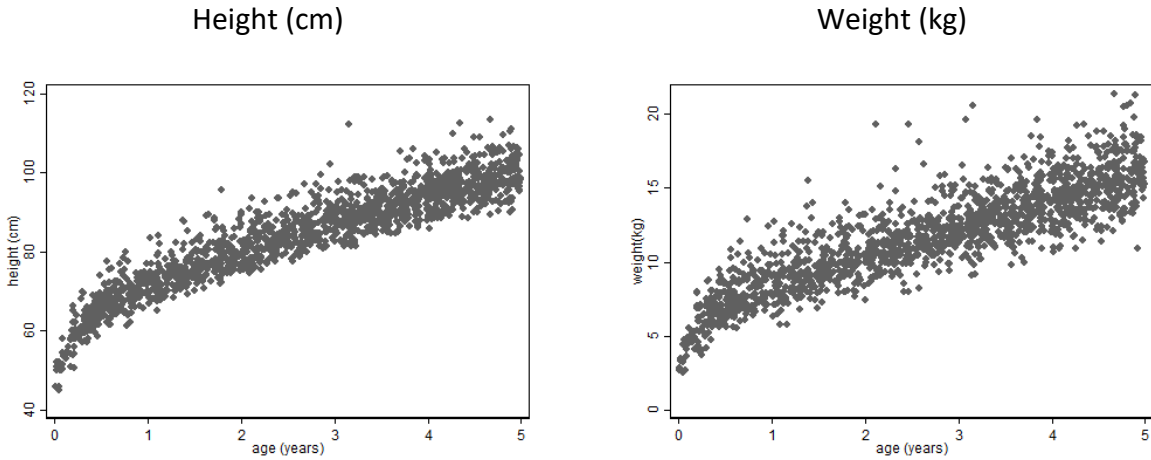
A
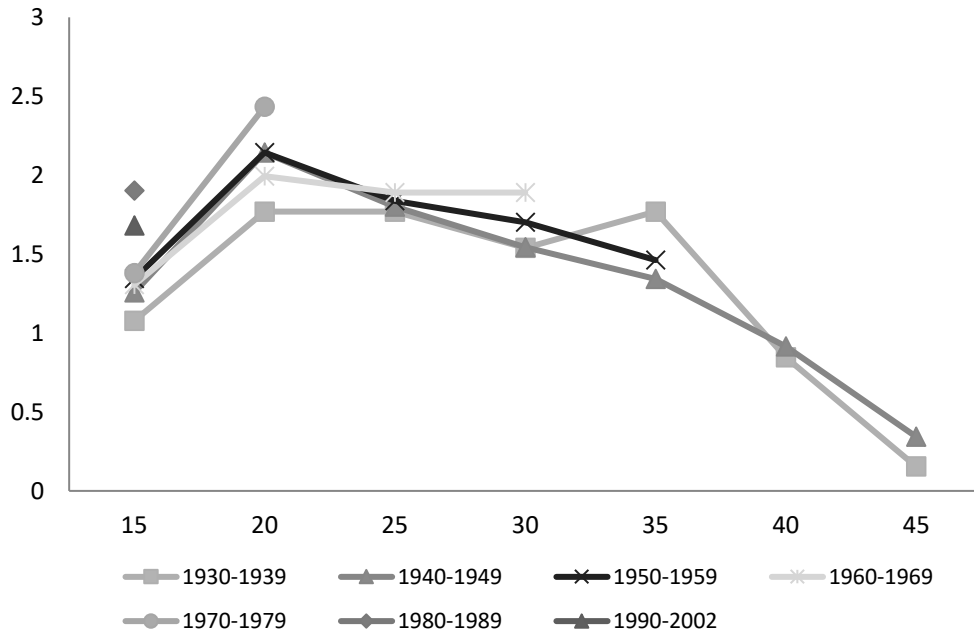
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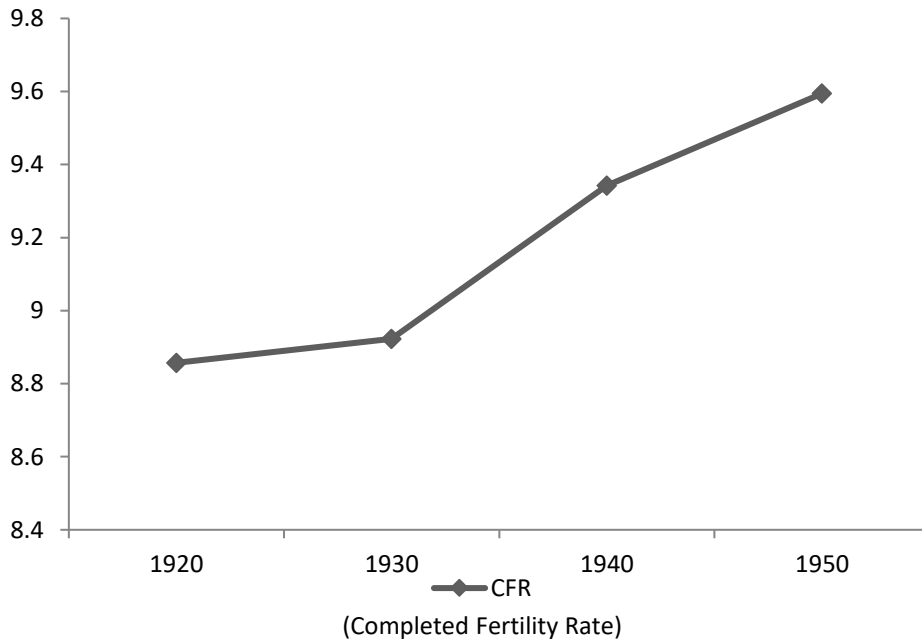
Source: THLHP Demographic Interviews, all women in sample (N=4,643)

Figure S3. Mean age at first birth and inter birth interval (years) by maternal birth cohort, IFS subsample (N = 211)

Mean Age First Birth

Mean Inter-Birth Interval (Years)

Figure S4. Child Height and Weight by Age (1,561 measurements, 638 children aged 0-5)

Height (cm)

Weight (kg)

Figure S5. Distribution of Mother's and Father's IFS, Fraction of total sample
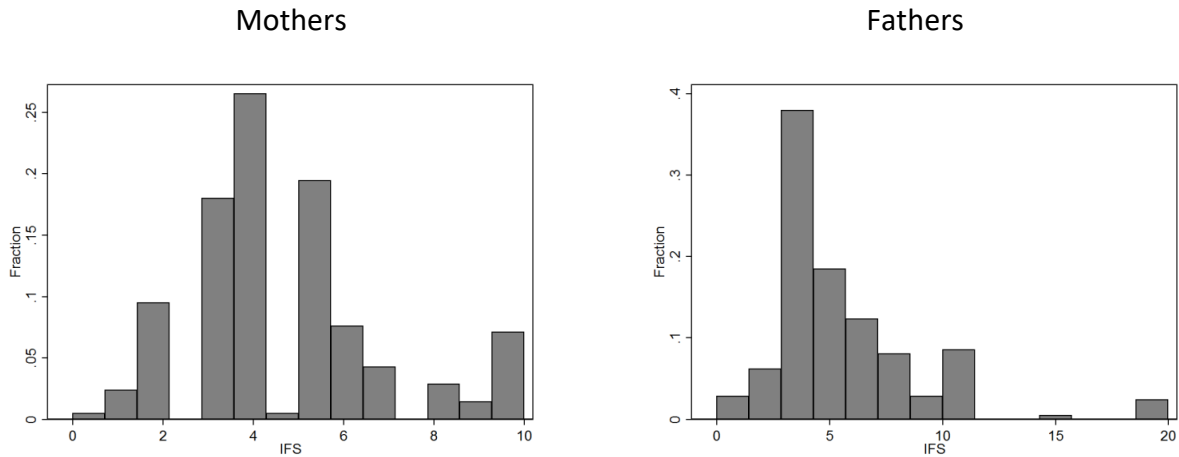
Mothers

Fathers

Figure S6. Distribution of HAZ and WAZ in Sample of children aged 0-5

Height-for-age (HAZ)   **Weight-for-age (WAZ)**
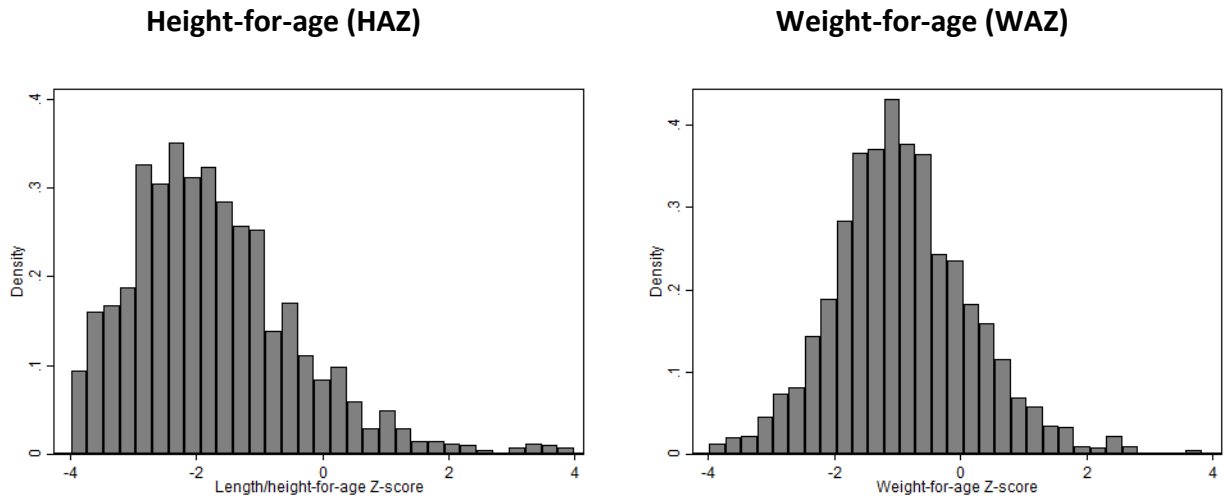
Table S1. Child and Parent Characteristics, 211 Partner Pairs

Parent Characteristics	Fathers			Mothers			T-Test (P-value)		
	Mean	95% CI	SD	Mean	95% CI	SD	T<t	|T|>|t|	T>t
Proportion with Parity > IFS at Interview (n=211)	0.47	0.41, 0.54	0.50	0.50	0.43, 0.57	0.50	0.78	0.44	0.22
Proportion with Parity > IFS by end of Follow-Up Period (n=211)	0.67	0.60, 0.73	0.47	0.76	0.71, 0.82	0.43	1.00	0.00	0.00
Parity at Interview (n=211)	5.88	5.40, 6.36	3.56	5.56	5.13, 5.99	3.17	0.01	0.02	0.99
Proportion Literate (n=209)	0.58	0.51, 0.65	0.49	0.32	0.26, 0.38	0.47	1.00	0.00	0.00
Proportion Speaking Spanish (n=209)	0.89	0.85, 0.94	0.31	0.51	0.44, 0.58	0.50	0.00	0.00	1.00

Household Characteristics	Mean	95% CI	SD
Maternal BMI (n=209)	23.78	23.37, 24.20	3.05
Proportion with one Son Living in Household (n=211)	0.97	0.95, 0.99	0.17
Distance to SB in km (n=211)	43.81	40.87, 46.74	21.75

Child Characteristics (n=643, obs = 1573)	Mean	95% CI	SD
Age at measurement in years	2.66	2.59, 2.73	1.43
Proportion Male	0.51	0.49, 0.54	0.50
Birth order	5.81	5.65, 5.96	3.13
Proportion Exceeded Mother's IFS	0.57	0.55, 0.59	0.50
Proportion Exceeded Father's IFS	0.49	0.47, 0.51	0.50
Proportion Exceeded both parents' IFS	0.44	0.42, 0.47	0.50
Amount exceeded IFS (maternal IFS-birth order)	-1.14	-1.30, -0.97	3.28
Amount exceeded IFS (paternal IFS-birth order)	-0.25	-0.44, -0.06	3.82
Height-for-age Z-score (HAZ)	-1.72	-1.78, -1.65	1.34
Weight-for-age Z-score (WAZ)	-0.91	-0.97, -0.86	1.11
Proportion Stunted	0.47	0.44, 0.49	0.50
Hemoglobin g/dL (n=484, obs=766)	11.43	11.35, 11.51	1.12
Proportion Anemic (n=484, obs=766)	0.08	0.06, 0.10	0.27

Table S2. Predictors of Maternal Ideal Family Size: Poisson Count Models

	Model 1: Age and Parity		Model 2: Parity Only		Model 3: Age Only	
	β	p	β	p	β	p
BMI	0.001	0.939	0.001	0.946	0.000	0.977
One Living Son in Household	0.458	0.087	0.456	0.088	0.459	0.086
Age at Interview	-0.001	0.915			**0.013**	**0.005**
Parity at Interview	**0.041**	**0.042**	**0.040**	**0.000**		
Literate	0.091	0.345	0.092	0.344	0.071	0.458
Speaks Spanish	-0.009	0.923	-0.010	0.918	0.009	0.924
Husband IFS	**0.033**	**0.001**	**0.033**	**0.000**	**0.038**	**0.000**
Husband Literate	-0.137	0.094	-0.136	0.094	-0.135	0.099
Husband Speaks Spanish	0.180	0.137	0.182	0.128	0.214	0.074
Distance to San Borja (km)	0.002	0.292	0.002	0.294	0.001	0.380
Number of Parents	207		207		207	
Pseudo R-squared	0.066		0.066		0.061	
AIC	852.005		850.016		854.180	

Table S3. Predictors of Paternal Ideal Family Size: Poisson Count Models

	Model 1: Age and Parity		Model 2: Parity Only		Model 3: Age Only	
	β	p	β	p	β	p
Wife's BMI	-0.004	0.659	-0.004	0.651	-0.005	0.599
One Son Living in Household	0.292	0.219	0.286	0.228	0.338	0.153
Age at Interview	-0.005	0.337			**0.019**	**0.000**
Parity at Interview	**0.077**	**0.000**	**0.069**	**0.000**		
Literate	0.066	0.479	0.073	0.433	0.000	0.998
Speaks Spanish	**-0.170**	**0.048**	**-0.183**	**0.032**	**-0.192**	**0.025**
Wife IFS	**0.055**	**0.000**	**0.054**	**0.000**	**0.078**	**0.000**
Wife Literate	0.038	0.620	0.054	0.470	0.126	0.097
Wife Speaks Spanish	0.045	0.672	0.054	0.609	0.070	0.508
Distance to San Borja (km)	**0.006**	**0.000**	**0.006**	**0.000**	**0.006**	**0.000**
Number of Parents	207		207		207	
Pseudo R-squared	0.161		0.160		0.119	
AIC	916.429		915.355		958.439	

Table S4: Factors Predicting WHZ in children aged 0-2

	WHZ (1)		(2)		(3)	
	β	p	β	p	β	p
Age at Measurement	-0.096	0.440	-0.101	0.419	-0.105	0.401
Female	-0.017	0.910	-0.052	0.726	-0.061	0.683
Birth Order	-0.030	0.540	-0.027	0.588	-0.004	0.930
Maternal BMI	**0.056**	**0.028**	**0.059**	**0.021**	**0.060**	**0.019**
Exceeded Mom's Ideals	0.257	0.292	0.196	0.424		
Exceeded Dad's Ideals	-0.088	0.705	-0.064	0.786		
Maternal IFS	0.076	0.113	0.070	0.151	0.045	0.292
Paternal IFS	-0.043	0.215	-0.036	0.317	-0.032	0.299
Mother Speaks Spanish			0.112	0.478	0.113	0.475
Father Speaks Spanish			-0.205	0.451	-0.198	0.468
Exceeded both parents' Ideals					-0.058	0.804
AIC	2108		2089		2088	
N	549		543		543	

Table S5: Factors Predicting WHZ in children aged 2-5

	WHZ (1)		(2)		(3)	
	β	p	β	p	β	p
Age at Measurement	**0.158**	**0.000**	**0.153**	**0.000**	**0.152**	**0.000**
Female	0.044	0.573	0.038	0.624	0.037	0.625
Birth Order	0.013	0.510	0.006	0.766	0.010	0.588
Maternal BMI	**0.052**	**0.000**	**0.054**	**0.000**	**0.054**	**0.000**
Exceeded Mom's Ideals	0.059	0.647	0.040	0.752		
Exceeded Dad's Ideals	0.025	0.844	0.046	0.709		
Maternal IFS	0.041	0.068	0.041	0.068	0.039	0.053
Paternal IFS	**-0.048**	**0.002**	**-0.037**	**0.019**	**-0.037**	**0.010**
Mother Speaks Spanish			**0.255**	**0.002**	**0.256**	**0.002**
Father Speaks Spanish			0.054	0.670	0.053	0.679
Exceeded both parents' Ideals					0.055	0.645
AIC	2957		2933		2931	
N	1012		1006		1006	

Table S6: Multilevel Models Predicting HAZ, WAZ, and WHZ in Children aged 2-5, Interacted with Distance to Town of San Borja

	HAZ: Exceeded Mothers'		HAZ: Exceeded Fathers'		WAZ: Exceeded Mothers'		WAZ: Exceeded Fathers'		WHZ: Exceeded Mothers'		WHZ: Exceeded Fathers'	
	β	p	β	p	β	p	β	p	β	p	β	P
Age at Measurement	-0.007	0.772	-0.007	0.773	0.009	0.721	0.009	0.701	**0.137**	**<0.001**	**0.138**	**<0.001**
Male	-0.134	0.126	-0.133	0.126	0.021	0.769	0.018	0.805	0.063	0.389	0.061	0.408
Birth Order (Categorical)												
3-4 (1-2 baseline)	-0.150	0.286	-0.145	0.302	-0.057	0.627	-0.060	0.606	0.046	0.692	0.039	0.738
5-7	-0.061	0.742	-0.047	0.800	-0.068	0.657	-0.065	0.675	-0.060	0.697	-0.063	0.684
8+	-0.298	0.181	-0.288	0.193	-0.252	0.178	-0.253	0.176	-0.081	0.663	-0.087	0.638
Maternal BMI	0.015	0.377	0.015	0.383	**0.047**	**0.002**	**0.047**	**0.002**	**0.053**	**<0.001**	**0.054**	**<0.001**
Exceeded Maternal IFS (0/1)	-0.509	0.053	-0.296	0.065	**-0.563**	**0.011**	-0.163	0.225	-0.273	0.219	0.067	0.627
Exceeded Paternal IFS (0/1)	0.280	0.072	-0.164	0.520	**0.279**	**0.032**	-0.104	0.631	0.102	0.441	-0.090	0.674
Mother Speaks Spanish	0.035	0.760	0.035	0.756	0.195	0.056	0.189	0.060	**0.267**	**0.003**	**0.261**	**0.004**
Maternal IFS	-0.005	0.861	-0.007	0.824	0.021	0.437	0.021	0.432	0.039	0.112	0.040	0.105
Father Speaks Spanish	0.117	0.571	0.108	0.597	0.154	0.394	0.137	0.446	0.095	0.573	0.085	0.611
Father IFS	0.013	0.531	0.013	0.521	-0.013	0.495	-0.012	0.508	-0.032	0.058	-0.031	0.065
Distance to San Borja (km)	-0.003	0.391	-0.005	0.127	-0.005	0.153	-0.004	0.206	-0.004	0.234	-0.002	0.584
> Maternal IFS * Distance to San Borja	0.005	0.263			**0.009**	**0.018**			**0.008**	**0.044**		
> Paternal IFS * Distance to San Borja			**0.010**	**0.027**			**0.009**	**0.027**			0.004	0.245