Varied patterns of catch-up in child growth: evidence from Young Lives

Supplementary material

Appendix A Elaboration on empirical methods

This section elaborates on the empirical methods we use in our analysis. First, latent growth models can be estimated in a number of ways. In much of the literature, correlated random effects estimators are used, in which the unobserved heterogeneity terms (α_i, β_i) are treated as random effects, presumed to follow a multivariate normal distribution. Such estimators allow the full range of catch-up hypotheses to be tested (see Johnson 2015), but have some limitations. In most applications of such estimators, the final two moments of the general system (see equation 1c, main text) remain restricted to zero – i.e., all elements of x are treated as orthogonal to the unobserved heterogeneity terms. In part, this assumption derives from technical challenges of convergence – the more parameters there are to be estimated, the longer it takes to achieve model convergence and/or convergence is more prone to failure (Chirwa et al. 2014, Gurka et al. 2011). The trade-off is that misspecification of the structure of correlation between so-called fixed and random effects is not innocuous and will deliver inconsistent estimates if independence restrictions are violated (see Hausman 1978, Jacqmin-Gadda et al. 2007).

An alternative approach is to treat the unobserved heterogeneity terms as 'fixed' latent variables. Fixed-effects estimators for additive terms are commonplace and generally preferred within the economics literature. However, estimators allowing for fixed individual-specific slopes are generally less known. The latter models, often referred to as FEIS estimators- (fixed effects with individual slopes), were originally introduced by Polachek and Kim (1994) but until recently were not widely used due to implementation challenges. In our case, an advantage is that FEIS estimators impose no restrictions on any of the moments, nor do they impose specific distributional assumptions on the latent variables. Furthermore, advances in computing power and estimation algorithms mean these models can now be implemented with ease, even in the context of large panels (Guimarães and Portugal 2010). Consequently, we adopt the flexible FEIS estimator here.

In an earlier working paper version (Anon 2018), we evaluated the performance of the FEIS estimator relative to both ordinary least squares (OLS) and correlated mixed effects (CRE) approaches. We find the FEIS and CRE approaches deliver qualitatively similar estimates of interest. Although a primary drawback of the FEIS estimator is one of over-parametrization (i.e., estimation of unnecessary parameters), the comparison reveals that the FEIS estimator outperforms the CRE estimator in tests of consistency and goodness-of-fit (using RMSE and AIC criteria). The FEIS is also preferable in terms of estimation speed and convergence success. A further concern is the presence of measurement error in the (latent) fixed effects estimates. To address this, we shrunk them toward the sample means of zero in accordance with the number of observations used to estimate each effect. This corresponds to a conventional empirical Bayes procedure (see Koedel et al. 2015), yielding a shrinkage factor of 80% in the majority of cases where the child is observed across all four rounds.

Second, the scaling of the age variable is important. It is well-known that estimates of both the intercept and the slope-intercept covariance in latent growth models are sensitive to the point at which one sets $t = 0$ (Biesanz et al. 2004, Stoel and Van Den Wittenboer 2003). Whilst different choices can help address different analytical questions, Tu and Gilthorpe (2011) demonstrate that age/time must be demeaned (i.e., one must use $t_i^* = t_i - \bar{t}$) to avoid distortion of the null hypothesis of zero correlation between the slope and the intercept (see also Blance et al. 2005, Tu and Gilthorpe 2007). We apply this definition here, which ensures a clean interpretation of the estimated slope-intercept correlation coefficient under the null hypothesis that it is equal to zero. Consequently, the individual intercept terms $(\alpha_0 + \alpha_i)$ represent the expected outcome for the child at around 6.5 years of age.

Third, following Table 2 (main text), decisions regarding the various types of catch-up growth require evidence from *separate* parameter tests to be combined. To do so, we combine the relevant individual probabilities using a maxP omnibus test. Following Wilkinson (1951), the maximum probability (maxP) associated with a set of individual null hypothesis represents a straightforward joint test of whether they can be rejected in all cases simultaneously (i.e., it is a test of their disjunction). To address type II errors from multiple testing, we adjust the applied confidence level using a conservative Bonferonni procedure, which is robust to arbitrary dependence between individual tests (Clarke and Hall 2009). Thus, to test for between-group convergence, we take the highest probability of the separate one-sided nulls ($\alpha_0 \geq 0; \beta_0 \leq 0$) and adjust the chosen confidence level by a factor of two. Similarly, to test for both within- and between-convergence, we take the highest probability of the three one-sided nulls and adjust the chosen confidence level by a factor of three.

Appendix B Heterogeneity analysis

In this section we extend the baseline estimates to examine variation in individual growth trajectories. Indeed, estimates of equation (1a, main text) concentrate on the broad direction and magnitude of catch-up growth. While such estimates can point to variation across different contexts and outcome measures, it leaves open what factors might account for variation in individual child growth trajectories within a given sample. Following Cole et al. (2010), individual growth curves can be characterised by a small number of parameters. Indeed, since we assume a linear growth specification (see below), our estimates of individual growth trajectories are defined by child mean stature: $\tilde{\alpha}_i = \hat{\alpha}_0 + \hat{\alpha}_i$; and linear growth velocity: $\tilde{\beta}_i = \hat{\beta}_0 + \hat{\beta}_i$. Thus, we can treat these estimates as dependent variables and investigate specific factors that are associated with variation in these parameters. Concretely, such analysis can be pursued via auxiliary regressions of the following forms:

$$\tilde{\alpha}_i = \delta_0 + \bar{x}_i'\delta_1 + \delta_{2c} + \eta_i \tag{1a}$$

$$\tilde{\beta}_i = \phi_0 + \bar{x}_i'\phi_1 + \phi_{2c} + \nu_i \tag{1b}$$

$$\tilde{\beta}_i^* = \lambda_0 + \rho_{\alpha\beta}\tilde{\alpha}_i^* + \rho_x(\tilde{\alpha}_i^{*\prime} \times \bar{x}_i) + \bar{x}_i'\lambda_1 + \lambda_{2c} + \psi_i \tag{1c}$$

Equations (1a) and (1b) express individual variation in mean stature and growth velocity as a linear function of child-specific averages of the explanatory covariates (x) and a community fixed effect (subscript c), which is used to capture the broad range of environmental effects that may be shared by children in the same location. Children are the unit of analysis (in cross-section) here, so we pool information and express the covariates as averages across rounds for each child. Recalling that the within-group catch-up parameter ($\rho_{\alpha\beta}$) captures the relationship (covariation) between mean stature and individual growth velocity, equation (1c) permits analysis of how this association also varies across the sample. To do so, we note that the sample average estimate for $\rho_{\alpha\beta}$ can be obtained from the standardized regression coefficient of β_i on α_i. We leverage this property and investigate interactions between α_i and the same set of covariates. This is shown in equation (1c), where the growth parameters enter in standardized form – e.g., $\tilde{\alpha}_i^* = \tilde{\alpha}_i/\sigma_\alpha$; and we focus interpretation on the resulting estimates for ρ_x, which probe for any systematic variation in the correlation between mean stature and growth.

Auxiliary analyses along these lines have been undertaken in various contexts (e.g., Acemoglu et al. 2009, Brand and Davis 2011). One challenge in applying this approach is that α_i and β_i are likely to be estimated with error. To address this, we follow the advice of Lewis and Linzer (2005) who suggest that, in small samples, unweighted OLS regressions combined with Efron or bootstrap consistent standard errors are generally reliable when the dependent variables are themselves estimates.

The results from our auxiliary regressions are presented in Tables C4 to C7, which correspond to the four YL countries respectively. In each table, we report the (selected) regression coefficients for each growth parameter based on both the relative (HAZ) and raw (HAD) scores. To facilitate interpretation, all continuous explanatory variables are centered on zero. However, all dummy variables remain binary in nature. So, the constant terms – or in the case of $\rho_{\alpha\beta}$, the non-interacted coefficient on α_i – give parameter estimates for a specific base category at the pooled sample mean of the continuous variables. This base category (indicated as such) refers to first-born boys, not from the majority ethno-linguistic group of the region, who are resident in rural areas in male-headed households.

We highlight four main findings from these results. First, there is systematic variation across the growth parameters and a number of the coefficient estimates are consistent with previous literature. In particular, household wealth displays a significant positive relationship with both size and velocity across most countries. Similarly, the highest school grade attained by the mother, here transformed into standard deviation units, shows a significant positive association with predicted child size (especially height), but a less systematic relation with growth velocity. Overall, the implication is that children from more advantaged households show enhanced average development outcomes and appear to extend their advantage over time relative to other children in the sample. However, these advantages generally do not imply that children from (relatively) wealthy families approximate the median child in the external reference population in stature, nor do they necessarily catch-up toward the same reference over time. This is indicated by the relatively moderate magnitude of the estimated coefficients on household wealth and mother's schooling attainment, especially in the HAD estimates. In this light, between-group catch-up remains elusive, particularly in both Ethiopia and India, even for children from more advantaged households in the sample.

Second, despite some similarities there are also notable differences among countries in the magnitude (and significance) of different explanatory factors. We also find considerable heterogeneity in the relative trajectories of boys and girls within each sample. In Ethiopia, India and Vietnam, girls show a smaller divergence to their gender-specific reference median stature than boys. Nonetheless, if HAZ scores are used, girls also show a slower pace of growth (faster divergence). In India and Ethiopia, we also find girls show within-group catch-up is also slower for girls versus boys using the HAZ scores. By contrast in Peru, there is no evidence of any systematic differences in growth trajectories across boys and girls. A further distinctive insight from India is a negative relationship between birth order and stature – i.e., first borns are significantly taller and grow faster than their younger siblings (particularly when based on HAD scores). A similar set of results is found in Vietnam. However, results for the Ethiopian sample reveal no clear birth order effects; and in Peru younger sibs simply appear smaller in stature (on average) but display similar velocities of within- and between-group catch-up. While it is beyond the scope of the data to deepen this analysis, these results suggest that patterns of childhood development (and disadvantage) vary in complex ways across different contexts.

Third, we find that community characteristics play a material role in explaining differences in growth trajectories. To illustrate this, we compare the explanatory power of the same regressions first with and then without community fixed effects. The difference in the (adjusted) R^2 estimates from these two regressions provides a lower bound on the variation attributable to unobserved variables that vary at the community level. For each specification, this contribution is reported in the footer of the regression tables. While the magnitudes vary, they frequently represent a substantial proportion of the total explained variance, particularly in Ethiopia and India which are (arguably) the most disadvantaged of the four country samples. This suggests that community-level differences, which may include access to health care services and other generalized policy approaches, may well explain some of the overall variation in growth trajectories founds across the samples.

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Appendix C Additional tables

Table C1: Estimates of catch-up growth for boys, by country and type

				Between			Within		Both
	α_0	β_0	$\rho_{\alpha\beta}$	H0$_{\alpha_0}$	H0$_{\beta_0}$	?	H0$_{\rho_{\alpha\beta}}$	?	?
(a) HAZ scores (relative outcome):									
Ethiopia	-1.440	0.014	-0.339	0.00	0.04	N	0.00	Y	N
	(0.056)	(0.008)	(0.052)						
India	-1.484	-0.008	-0.249	0.00	0.86	N	0.00	Y	N
	(0.051)	(0.008)	(0.054)						
Peru	-1.259	0.050	-0.165	0.00	0.00	Y	0.00	Y	Y
	(0.093)	(0.005)	(0.031)						
Vietnam	-1.152	0.026	0.023	0.00	0.00	Y	0.70	N	N
	(0.090)	(0.004)	(0.045)						
(b) HAD scores (raw outcome):									
Ethiopia	-7.072	-0.512	0.509	0.00	0.99	N	0.99	N	N
	(0.276)	(0.034)	(0.045)						
India	-7.441	-0.619	0.628	0.00	0.99	N	0.99	N	N
	(0.241)	(0.034)	(0.037)						
Peru	-6.545	-0.180	0.401	0.00	0.99	N	0.99	N	N
	(0.494)	(0.032)	(0.032)						
Vietnam	-5.667	-0.285	0.782	0.00	0.99	N	0.99	N	N
	(0.472)	(0.043)	(0.026)						

Note: these estimates are as per Table 4 (main text) but calculated only over boys in the sample.
Source: own estimates.

Table C2: Estimates of catch-up growth for girls, by country and type

	α_0	β_0	$\rho_{\alpha\beta}$	Between			Within		Both
				$H0_{\alpha_0}$	$H0_{\beta_0}$	?	$H0_{\rho_{\alpha\beta}}$	?	?
(a) HAZ scores (relative outcome):									
Ethiopia	-1.327	-0.009	-0.243	0.00	0.92	N	0.00	Y	N
	(0.073)	(0.006)	(0.047)						
India	-1.399	-0.021	-0.114	0.00	0.99	N	0.03	Y	N
	(0.043)	(0.007)	(0.061)						
Peru	-1.258	0.045	-0.134	0.00	0.00	Y	0.01	Y	Y
	(0.093)	(0.005)	(0.054)						
Vietnam	-1.099	0.013	0.057	0.00	0.00	Y	0.85	N	N
	(0.086)	(0.004)	(0.056)						
(b) HAD scores (raw outcome):									
Ethiopia	-6.743	-0.526	0.551	0.00	0.99	N	0.99	N	N
	(0.368)	(0.037)	(0.044)						
India	-7.173	-0.605	0.637	0.00	0.99	N	0.99	N	N
	(0.214)	(0.031)	(0.044)						
Peru	-6.729	-0.155	0.315	0.00	0.99	N	0.99	N	N
	(0.509)	(0.037)	(0.055)						
Vietnam	-5.557	-0.286	0.738	0.00	0.99	N	0.99	N	N
	(0.455)	(0.042)	(0.035)						

Note: these estimates are as per Table 4 (main text) but calculated only over girls in the sample.
Source: own estimates.

Table C3: Summary of results for different types of catch-up growth

Form:	Between		Within	
Metric:	Raw	Relative	Raw	Relative
Ethiopia	N	N	N	Y
India	N	N	N	Y
Peru	N	Y	N	Y
Vietnam	N	Y	N	N

Note: results taken from Table 4 (main text); cells indicate the presence of a given type of catch-up growth where N = No and Y = Yes.
Source: own estimates.

Table C4: Auxiliary regressions for Ethiopia

	α (size)		β (velocity)		$\rho_{\alpha\beta}$ (correlation)	
	HAZ	HAD	HAZ	HAD	HAZ	HAD
Base category	-1.543***	-7.654***	-0.003	-0.653***	-0.303***	0.543***
	(0.099)	(0.433)	(0.027)	(0.099)	(0.035)	(0.030)
Age (years)	-0.111**	-0.600***	0.002	0.007	-0.038	-0.109***
	(0.043)	(0.198)	(0.006)	(0.023)	(0.029)	(0.029)
Urban	0.227	1.100	0.035	0.316	0.011	-0.016
	(0.183)	(0.682)	(0.059)	(0.212)	(0.047)	(0.048)
Female	0.139***	0.479**	-0.023***	-0.005	0.051**	0.019
	(0.045)	(0.224)	(0.004)	(0.021)	(0.025)	(0.019)
Majority ELG	0.046	0.278	0.006	0.049	0.002	0.010
	(0.074)	(0.308)	(0.014)	(0.040)	(0.030)	(0.027)
Not first born	-0.022	-0.047	-0.000	-0.020	0.038	0.038
	(0.054)	(0.274)	(0.005)	(0.029)	(0.033)	(0.028)
Mother's edu.	0.056*	0.223	-0.008*	-0.017	0.050*	0.049*
	(0.032)	(0.167)	(0.005)	(0.022)	(0.027)	(0.029)
Mother's age	0.004	0.022	-0.000	-0.001	-0.026	-0.036
	(0.004)	(0.019)	(0.000)	(0.002)	(0.028)	(0.030)
Female head	-0.077	-0.423	-0.004	-0.044	-0.022	-0.020
	(0.053)	(0.263)	(0.007)	(0.034)	(0.024)	(0.025)
Wealth index	0.278***	1.337***	-0.010**	0.048*	0.022	0.046
	(0.038)	(0.196)	(0.005)	(0.024)	(0.031)	(0.035)
Household size	-0.004	-0.012	-0.000	-0.005	-0.074**	-0.082***
	(0.013)	(0.060)	(0.002)	(0.008)	(0.029)	(0.029)
Obs.	1,828	1,828	1,828	1,828	1,828	1,828
Adj. R^2	0.166	0.169	0.097	0.099	0.189	0.362
= Covars.	0.128	0.134	0.015	0.031	0.118	0.310
+ Community	0.038	0.036	0.082	0.068	0.070	0.052
Sample mean est.	-1.387	-6.916	0.003	-0.519	-0.298	0.528

significance: * 10%, ** 5%, *** 1%.

Note: table reports selected coefficient estimates from auxiliary analyses; the three primary columns correspond to estimates of equations (1a)–(1c), respectively; the secondary columns indicate the outcomes on which the first-stage regressions (see Table 4, main text) were based; individual children are the unit of observation and all covariates are taken as averages across rounds (demeaned); standard errors are based on 100 bootstrap iterations; community fixed effects are included.

Source: own estimates.

Table C5: Auxiliary regressions for India

	α (size)		β (velocity)		$\rho_{\alpha\beta}$ (correlation)	
	HAZ	HAD	HAZ	HAD	HAZ	HAD
Base category	-1.429***	-7.161***	-0.004	-0.577***	-0.198***	0.613***
	(0.031)	(0.142)	(0.006)	(0.026)	(0.036)	(0.024)
Age (years)	-0.158***	-0.836***	-0.001	-0.027	-0.059***	-0.098***
	(0.040)	(0.210)	(0.007)	(0.031)	(0.020)	(0.020)
Urban	0.012	0.015	-0.008	0.010	0.037	0.017
	(0.100)	(0.483)	(0.016)	(0.086)	(0.039)	(0.024)
Female	0.073**	0.215*	-0.012***	0.012	0.058**	-0.003
	(0.027)	(0.127)	(0.004)	(0.020)	(0.024)	(0.018)
Majority ELG	-0.034	-0.191	-0.003	-0.028	0.076***	0.062***
	(0.043)	(0.200)	(0.004)	(0.022)	(0.024)	(0.018)
Not first born	-0.098***	-0.458***	-0.003	-0.083***	-0.007	0.012
	(0.029)	(0.134)	(0.005)	(0.019)	(0.021)	(0.018)
Mother's edu.	0.041	0.167	-0.004	0.000	0.025	0.023
	(0.026)	(0.135)	(0.004)	(0.021)	(0.030)	(0.024)
Mother's age	0.014***	0.053**	-0.002***	-0.003	-0.001	-0.005
	(0.005)	(0.024)	(0.001)	(0.003)	(0.029)	(0.022)
Female head	0.159**	0.776**	0.003	0.090*	0.051**	0.036*
	(0.071)	(0.361)	(0.010)	(0.046)	(0.024)	(0.020)
Wealth index	0.159***	0.876***	0.009***	0.125***	0.063*	0.051*
	(0.025)	(0.131)	(0.003)	(0.017)	(0.033)	(0.028)
Household size	0.019**	0.123***	0.001	0.011**	-0.009	-0.012
	(0.009)	(0.040)	(0.001)	(0.004)	(0.022)	(0.015)
Obs.	1,912	1,912	1,912	1,912	1,912	1,912
Adj. R^2	0.124	0.128	0.118	0.142	0.178	0.489
= Covars.	0.096	0.108	0.022	0.107	0.097	0.457
+ Community	0.027	0.020	0.096	0.035	0.081	0.032
Sample mean est.	-1.444	-7.316	-0.014	-0.613	-0.190	0.632

significance: * 10%, ** 5%, *** 1%.

Note: table reports selected coefficient estimates from auxiliary analyses; the three primary columns correspond to estimates of equations (1a)–(1c), respectively; the secondary columns indicate the outcomes on which the first-stage regressions (see Table 4, main text) were based; individual children are the unit of observation and all covariates are taken as averages across rounds (demeaned); standard errors are based on 100 bootstrap iterations; community fixed effects are included.

Source: own estimates.

Table C6: Auxiliary regressions for Peru

	α (size)		β (velocity)		$\rho_{\alpha\beta}$ (correlation)	
	HAZ	HAD	HAZ	HAD	HAZ	HAD
Base category	-1.205***	-6.235***	0.057***	-0.134***	-0.172***	0.354***
	(0.047)	(0.237)	(0.006)	(0.035)	(0.040)	(0.045)
Age (years)	-0.064*	-0.349*	-0.017**	-0.073*	-0.012	-0.027
	(0.037)	(0.196)	(0.006)	(0.038)	(0.030)	(0.029)
Urban	-0.051	-0.241	0.004	-0.004	-0.014	-0.008
	(0.048)	(0.268)	(0.008)	(0.056)	(0.043)	(0.039)
Female	0.008	-0.138	-0.007	0.019	0.015	-0.045
	(0.028)	(0.143)	(0.005)	(0.033)	(0.031)	(0.029)
Majority ELG	0.015	0.056	-0.008	-0.024	0.011	0.012
	(0.034)	(0.186)	(0.007)	(0.041)	(0.028)	(0.032)
Not first born	-0.053**	-0.331**	-0.006	-0.043	0.029	0.039
	(0.025)	(0.130)	(0.007)	(0.043)	(0.029)	(0.030)
Mother's edu.	0.110***	0.590***	-0.003	0.018	-0.001	0.014
	(0.022)	(0.113)	(0.003)	(0.018)	(0.033)	(0.028)
Mother's age	0.005**	0.026**	-0.000	-0.002	-0.031	-0.020
	(0.002)	(0.011)	(0.000)	(0.003)	(0.019)	(0.020)
Female head	0.027	0.148	0.009	0.062	0.013	0.010
	(0.062)	(0.314)	(0.010)	(0.059)	(0.019)	(0.021)
Wealth index	0.195***	1.055***	0.009**	0.126***	-0.034	-0.043
	(0.025)	(0.130)	(0.004)	(0.024)	(0.042)	(0.035)
Household size	-0.039***	-0.160***	-0.002	-0.023**	-0.047	-0.046
	(0.009)	(0.048)	(0.002)	(0.011)	(0.036)	(0.034)
Obs.	1,909	1,909	1,909	1,909	1,909	1,909
Adj. R^2	0.335	0.356	0.042	0.081	0.060	0.156
= Covars.	0.299	0.318	0.011	0.058	0.033	0.128
+ Community	0.036	0.038	0.031	0.024	0.027	0.027
Sample mean est.	-1.259	-6.637	0.048	-0.167	-0.150	0.357

significance: * 10%, ** 5%, *** 1%.

Note: table reports selected coefficient estimates from auxiliary analyses; the three primary columns correspond to estimates of equations (1a)–(1c), respectively; the secondary columns indicate the outcomes on which the first-stage regressions (see Table 4, main text) were based; individual children are the unit of observation and all covariates are taken as averages across rounds (demeaned); standard errors are based on 100 bootstrap iterations; community fixed effects are included.

Source: own estimates.

Table C7: Auxiliary regressions for Vietnam

	α (size)		β (velocity)		$\rho_{\alpha\beta}$ (correlation)	
	HAZ	HAD	HAZ	HAD	HAZ	HAD
Base category	-1.201***	-5.846***	0.040***	-0.246***	-0.003	0.803***
	(0.052)	(0.280)	(0.010)	(0.063)	(0.028)	(0.018)
Age (years)	-0.081**	-0.413*	0.013***	0.049**	-0.053***	-0.056***
	(0.037)	(0.207)	(0.004)	(0.023)	(0.018)	(0.012)
Urban	0.176**	0.989***	-0.000	0.035	0.054	0.026
	(0.069)	(0.357)	(0.006)	(0.048)	(0.042)	(0.024)
Female	0.055*	0.127	-0.012***	0.008	0.002	-0.034*
	(0.029)	(0.142)	(0.004)	(0.021)	(0.030)	(0.019)
Majority ELG	0.082*	0.291	-0.016	-0.025	0.043	0.011
	(0.045)	(0.262)	(0.012)	(0.069)	(0.028)	(0.025)
Not first born	-0.073*	-0.356*	-0.001	-0.047**	0.037	0.033
	(0.040)	(0.197)	(0.004)	(0.022)	(0.030)	(0.021)
Mother's edu.	0.141***	0.706***	-0.000	0.055***	0.010	0.002
	(0.029)	(0.149)	(0.003)	(0.017)	(0.038)	(0.018)
Mother's age	-0.003	-0.023	-0.001***	-0.006**	-0.010	-0.003
	(0.003)	(0.017)	(0.000)	(0.002)	(0.027)	(0.017)
Female head	-0.121**	-0.623**	-0.003	-0.050*	0.005	0.005
	(0.048)	(0.236)	(0.006)	(0.027)	(0.026)	(0.018)
Wealth index	0.197***	1.186***	0.011***	0.118***	-0.036	-0.017
	(0.041)	(0.207)	(0.003)	(0.025)	(0.054)	(0.035)
Household size	-0.004	-0.030	0.000	-0.002	0.003	-0.009
	(0.014)	(0.071)	(0.001)	(0.007)	(0.031)	(0.016)
Obs.	1,905	1,905	1,905	1,905	1,905	1,905
Adj. R^2	0.332	0.355	0.054	0.200	0.057	0.628
= Covars.	0.270	0.294	0.032	0.157	0.035	0.608
+ Community	0.062	0.061	0.022	0.043	0.022	0.020
Sample mean est.	-1.126	-5.614	0.020	-0.286	0.035	0.762

significance: * 10%, ** 5%, *** 1%.

Note: table reports selected coefficient estimates from auxiliary analyses; the three primary columns correspond to estimates of equations (1a)–(1c), respectively; the secondary columns indicate the outcomes on which the first-stage regressions (see Table 4, main text) were based; individual children are the unit of observation and all covariates are taken as averages across rounds (demeaned); standard errors are based on 100 bootstrap iterations; community fixed effects are included.

Source: own estimates.