

Supporting Information

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SI Text

Extended Ages and Stages Questionnaire. Trained fieldworkers read each item to the parent or caregiver and recorded responses as yes, sometimes, or not yet. The Ages and Stages Questionnaires, second edition (ASQ) have been validated as screening tests to detect children at risk for developmental delays compared with children developing normatively for age in the United States. Because we were adapting the measures to many different countries that had not used the test before, we were concerned that all items might not be appropriate for use in all countries and that we could not use cutoffs for a US sample in other countries. To convert the original ASQ to our Extended Ages and Stages Questionnaire (EASQ), we documented each item and then included items that were included in the original ASQ for that age range plus all additional items that were also included in the next highest age questionnaire. We also added some demonstration items to protocols used in each country, which were included to provide children the opportunity to perform tasks that were not easily observed and a validity check (by observation) of what the child showed compared with what the parent reported. Because

the overall objective of the World Bank's study was to gather data that would allow comparisons of water and sanitation programs in four countries, efforts were made to keep all measures as uniform as possible, including the EASQ. For ease in data management and analyses, rather than exclude EASQ items from one or more countries, we opted to provide an option of not applicable for items that were not administered, because they were not relevant in any particular country. If more than 20% of the sample for a particular country answered not applicable to a question, we did not use the question in calculating the total score for each domain, because we considered the question not to be valid. For example, given that most children in Senegal have never been exposed to a wagon, shopping cart, or stroller, 42% of respondents replied not applicable to the following question: does your child push a little shopping cart, stroller, or wagon (or other object with wheels), steering it around objects and backing out of corners if he cannot turn? Overall, dropping questions because of high rates of not applicable responses occurred for nine items in Senegal that had more than 20% of the sample answer not applicable.

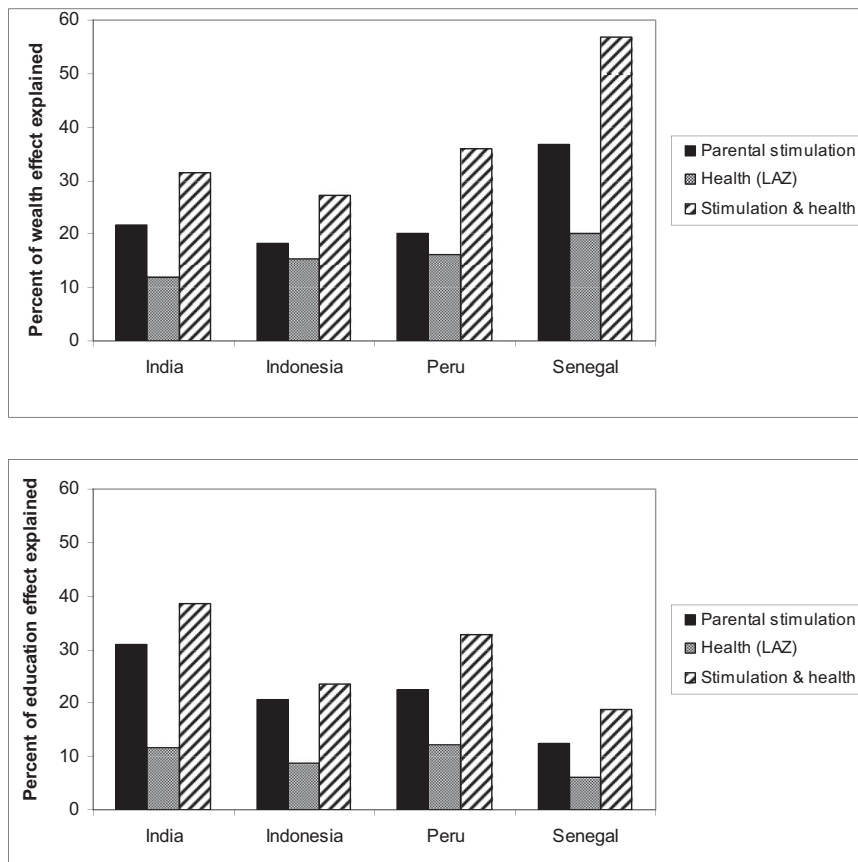


Fig. S1. Percent of wealth (*Upper*) and education (*Lower*) gradients in child development outcomes measured by EASQ explained by parental home stimulation (Family Care Indicators) and/or physical health (length-for-age z score [LAZ]) in children from four countries.

Table S1. Effect of household wealth and maternal education and interactions with age on child development (EASQ) z score adjusted for covariates

	India	Indonesia	Peru	Senegal
Age effect by household wealth				
Children 8–15 mo (children 0–7 mo are reference group)	0.03 (0.06)	0.26 (0.07)*	0.23 (0.05)*	0.26 (0.09)*
Children 16–23 mo	0.01 (0.07)	0.15 (0.09) [†]	0.12 (0.06) [‡]	0.08 (0.11)
Richest quintile (other quintiles are reference group)	–0.08 (0.09)	–0.13 (0.13)	0.19 (0.09) [‡]	0.44 (0.18) [‡]
Children 8–15 mo × richest quintile	0.33 (0.10)*	0.09 (0.14)	–0.17 (0.11)	–0.24 (0.17)
Children 16–23 mo × richest quintile	0.50 (0.12)*	0.41 (0.16)*	0 (0.11)	–0.15 (0.19)
Observations	2,942	1,631	2,805	1,182
R ²	0.171	0.197	0.204	0.179
Age effect by maternal education				
Children 8–15 mo (children 0–7 mo are reference group)	–0.01 (0.06)	0.25 (0.07)*	0.22 (0.06)*	0.23 (0.10) [‡]
Children 16–23 mo	–0.04 (0.07)	0.20 (0.08) [‡]	0.06 (0.07)	0.06 (0.11)
Mothers with >9 y of school (mothers with less education are reference group)	–0.31 (0.10)*	0.02 (0.14)	0.12 (0.09)	
Children 8–15 mo × mothers with >9 y of school	0.56 (0.11)*	0.10 (0.17)	–0.05 (0.11)	0.21 (0.13)
Children 16–23 mo × mothers with >9 y of school	0.73 (0.12)*	0.22 (0.17)	0.20 (0.10) [‡]	–0.06 (0.16)
Mothers with some schooling				0.21 (0.13)
Children 8–15 mo × mothers with some schooling				–0.06 (0.16)
Children 16–23 mo × mothers with some schooling				–0.03 (0.18)
Observations	2,942	1,631	2,805	1,182
R ²	0.183	0.207	0.201	0.179

Robust SEs clustered at the village in parentheses. All specifications contain village indicators and control for whether child is male, age of mother, whether mother is married, mother's education category, and household size.

* $P < 0.01$.

[†] $P < 0.10$.

[‡] $P < 0.05$.

Table S2. Effect of household wealth and maternal education and interactions with age on LAZ score adjusted for covariates

	India	Indonesia	Peru	Senegal
Age effect by household wealth				
Children 8–15 mo (children 0–7 mo are reference group)	–0.58 (0.10)*	–0.66 (0.08)*	–0.45 (0.05)*	–0.57 (0.09)*
Children 16–23 mo	–1.48 (0.11)*	–1.24 (0.08)*	–0.81 (0.06)*	–1.04 (0.10)*
Richest quintile (other quintiles are reference group)	0.08 (0.18)	0.08 (0.13)	0.02 (0.10)	–0.13 (0.15)
Children 8–15 mo × richest quintile	0.29 (0.21)	0.01 (0.18)	0.18 (0.11) [†]	0.28 (0.20)
Children 16–23 mo × richest quintile	0.64 (0.21)*	0.29 (0.17) [†]	0.33 (0.13) [‡]	0.30 (0.18) [‡]
Observations	3,474	2,019	3,543	1,852
R ²	0.276	0.306	0.248	0.205
Age effect by maternal education				
Children 8–15 mo (children 0–7 mo are reference group)	–0.64 (0.10)*	–0.68 (0.08)*	–0.49 (0.05)*	–0.65 (0.11)*
Children 16–23 mo	–1.51 (0.11)*	–1.22 (0.09)*	–0.82 (0.07)*	–1.10 (0.11)*
Mothers with >9 y of school (mothers with less education are reference group)	–0.27 (0.14) [‡]	0.06 (0.13)	0.07 (0.07)	
Children 8–15 mo × mothers with >9 y of school	0.60 (0.18)*	0.11 (0.18)	0.17 (0.09) [†]	–0.27 (0.12) [‡]
Children 16–23 mo × mothers with >9 y of school	0.73 (0.17)*	0.22 (0.17)	0.19 (0.10) [†]	0.36 (0.16) [‡]
Mothers with some schooling				–0.27 (0.12) [‡]
Children 8–15 mo × mothers with some schooling				0.36 (0.16) [‡]
Children 16–23 mo × mothers with some schooling				0.33 (0.16) [‡]
Observations	3,474	2,019	3,543	1,852
R ²	0.278	0.310	0.245	0.212

Robust SEs clustered at the village in parentheses. All regressions contain village indicators and control for whether child is male, age of mother, whether mother is married, wealth category, and household size.

* $P < 0.01$.

[†] $P < 0.10$.

[‡] $P < 0.05$.

Table S3. Socioeconomic gradients in parental home stimulation, as measured by Family Care indicators

	India	Indonesia	Peru	Senegal
The child:				
Plays with household items				
Wealth effect on mediator ¹	−0.01 (0.02)	−0.01 (0.04)	0.03 (0.03)	−0.12 (0.06)*
Education effect on mediator ²	0.02 (0.02)	−0.02 (0.09)	−0.04 (0.04)	0.01 (0.03)
Plays with toys				
Wealth effect on mediator	0.26 (0.04) [†]	0.11 (0.03) [†]	0.10 (0.03) [†]	0.43 (0.09) [†]
Education effect on mediator	0.14 (0.03) [†]	0.08 (0.09)	0.17 (0.04) [†]	0.01 (0.04)
Owns a children's book				
Wealth effect on mediator	0.10 (0.03) [†]	0.10 (0.04)*	0.11 (0.03) [†]	0.02 (0.01)
Education effect on mediator	0.07 (0.02) [†]	0.17 (0.08) [‡]	0.12 (0.02) [†]	0.01 (0.01) [†]
In the past three days, adult:				
Read a book to child		−		
Wealth effect on mediator	0.09 (0.03) [†]		0.08 (0.04)*	0.01 (0.06)
Education effect on mediator	0.09 (0.03) [†]		0.23 (0.04) [†]	0.03 (0.02)
Told a story to child		−		
Wealth effect on mediator	0.08 (0.03)*		0.04 (0.04)	−0.00 (0.07)
Education effect on mediator	0.09 (0.03) [†]		0.22 (0.04) [†]	0.01 (0.04)
Sang a song to child		−		
Wealth effect on mediator	0.11 (0.04)*		0.09 (0.04)*	0.07 (0.08)
Education effect on mediator	0.10 (0.03) [†]		0.21 (0.05) [†]	0.02 (0.04)
Went out with child		−		
Wealth effect on mediator	0.02 (0.03)		0.03 (0.02)	0.09 (0.07)
Education effect on mediator	0.05 (0.03)		−0.02 (0.02)	−0.02 (0.03)
Played with child		−		
Wealth effect on mediator	0.11 (0.04) [†]		0.05 (0.03) [‡]	0.09 (0.06) [‡]
Education effect on mediator	0.07 (0.03)*		0.06 (0.04) [†]	−0.02 (0.03)
Named things, counted, drew with child				
Wealth effect on mediator	0.08 (0.03) [†]		0.08 (0.04) [‡]	0.16 (0.10)
Education effect on mediator	0.07 (0.03) [†]		0.24 (0.05) [†]	0.04 (0.03)
Family Care Index ³				
Wealth effect on mediator	0.82 (0.12) [†]	0.19 (0.06) [†]	0.61 (0.14) [†]	0.75 (0.30)*
Education effect on mediator	0.71 (0.12) [†]	0.22 (0.16)	1.19 (0.16) [†]	0.09 (0.13)

Robust standard errors clustered at the village in parentheses. All specifications contain children's age in month indicators and village indicators and control for child's sex, whether mother is married, mother's age, household size, household wealth, and mother's education. Data for adult activities with children not available for Indonesia. Sample consists of children with non-missing EASQ scores and nonmissing Family Care Index.

* $P < 0.05$

[†] $P < 0.01$

[‡] $P < 0.10$.

¹Wealth effect refers to the comparison of those in the 5th wealth quintile to those in the first for the specific activity

²Education effect refers to the comparison of children with mothers who have more than 9 years of schooling to those with no schooling, except for Senegal which compares "Mother has some schooling" to "Mother has no schooling".

³Family Care Index is constructed by summing up each dichotomous Family Care Indicator. Values range from 0–9 for India, Peru, and Senegal, and from 0–3 for Indonesia.

Table S4. Mediation analysis: Home stimulation (Family Care Index)

	(1) India	(2) Indonesia	(3) Peru	(4) Senegal
First wealth quintile (reference group)				
Second wealth quintile	0.05 (0.06)	0.21 (0.08)*	0.03 (0.08)	0.04 (0.12)
Third wealth quintile	0.27 (0.07)*	0.29 (0.09)*	0.08 (0.07)	-0.03 (0.13)
Fourth wealth quintile	0.22 (0.08)*	0.32 (0.09)*	0.14 (0.09)	-0.12 (0.16)
Fifth wealth quintile	0.40 (0.08)*	0.27 (0.10)*	0.20 (0.09) [†]	0.19 (0.18)
No schooling (reference group)				
Mothers with 1–5 y of schooling	-0.03 (0.06)	0.21 (0.21)	0.16 (0.10)	
Mothers with 6 y of schooling	0.17 (0.13)	0.19 (0.18)	0.19 (0.11) [‡]	
Mothers with 7–9 y of schooling	0.09 (0.06)	0.16 (0.19)	0.34 (0.11)*	
Mothers with >9 y of schooling	0.18 (0.08) [†]	0.27 (0.19)	0.38 (0.10)*	
Mother has some schooling				0.14 (0.07) [†]
Family Care Index	0.12 (0.02)*	0.29 (0.04)*	0.09 (0.01)*	0.14 (0.03)*
Observations	2,641	1,614	2,766	1,078
R ²	0.228	0.275	0.247	0.260
F test: Wealth indicators [§]	<0.001	0.006	0.22	0.08
F test: Education indicators [¶]	0.06	0.44	<0.001	—
Total wealth effect	0.51 (0.08)*	0.33 (0.10)*	0.25 (0.09)*	0.30 (0.18)
Indirect wealth effect as a percent of total effect**	21.6%	18.2%	20.0%	36.7%
Total education effect ^{††}	0.26 (0.08)*	0.34 (0.19) [‡]	0.49 (0.10)*	0.16 (0.07) [†]
Indirect education effect as a percent of total effect ^{**}	30.8%	20.6%	22.4%	12.5%

Robust SEs clustered at the village in parentheses. All specifications contain children's age in months indicators and village indicators and control for child's sex, mother's age, whether the mother is married, and household size. Sample consists of all children with nonmissing EASQ and LAZ.

* $P < 0.01$.

[†] $P < 0.05$.

[‡] $P < 0.10$.

[§]Gives the P value on a test of joint significance of the wealth categories.

[¶]Gives the P value on a test of joint significance of the education categories.

^{||}Total wealth effect comes from a regression model similar to the one reported in the table but without the Family Care Index. Wealth effect refers to the comparison in EASQ z scores of families in the fifth wealth quintile with families in the first quintile.

**Indirect wealth effect is the change in the wealth effect after adding the Family Care Index.

^{††}Total education effect comes from a regression model similar to the one reported in this table but without the Family Care Index. Education effect refers to the comparison in EASQ z scores of children with mothers with more than 9 y of schooling with children with mothers with no schooling. The exception is Senegal, where the education effect compares mothers with some schooling with mothers with no schooling.

^{**}Indirect education effect is the change in the education effect after adding the Family Care Index.

Table S5. Mediation analysis: length-for-age (LAZ) score

	(1) India	(2) Indonesia	(3) Peru	(4) Senegal
First wealth quintile (reference group)				
Second wealth quintile	0.06 (0.06)	0.20 (0.08)*	0.02 (0.08)	0.06 (0.12)
Third wealth quintile	0.29 (0.07) [†]	0.31 (0.09) [†]	0.09 (0.07)	−0.03 (0.13)
Fourth wealth quintile	0.26 (0.08) [†]	0.34 (0.09) [†]	0.13 (0.08)	−0.08 (0.16)
Fifth wealth quintile	0.45 (0.08) [†]	0.28 (0.10) [†]	0.21 (0.09)*	0.24 (0.18)
No schooling (reference group)				
Mothers with 1–5 y of schooling	0.00 (0.06)	0.18 (0.22)	0.20 (0.10)*	
Mothers with 6 y of schooling	0.22 (0.13) [‡]	0.20 (0.19)	0.23 (0.11)*	
Mothers with 7–9 y of schooling	0.11 (0.06) [‡]	0.20 (0.20)	0.39 (0.11) [†]	
Mothers with >9 y of schooling	0.23 (0.08) [†]	0.31 (0.20)	0.43 (0.10) [†]	
Mother has some schooling				0.15 (0.07)*
LAZ score	0.08 (0.01) [†]	0.14 (0.02) [†]	0.11 (0.02) [†]	0.11 (0.03) [†]
Observations	2,641	1,614	2,766	1,078
R ²	0.215	0.268	0.241	0.243
F test: Wealth indicators [§]	<0.001	0.004	0.11	0.09
F test: Education indicators [¶]	0.03	0.32	<0.001	—
Total wealth effect	0.51 (0.08) [†]	0.33 (0.10) [†]	0.25 (0.09) [†]	0.30 (0.18)
Indirect wealth effect as a percent of total effect**	11.8%	15.2%	16.0%	20.0%
Total education effect ^{††}	0.26 (0.08) [†]	0.34 (0.19) [‡]	0.49 (0.10) [†]	0.16 (0.07)*
Indirect education effect as a percent of total effect ^{**}	11.5%	8.8%	12.2%	6.3%

Robust SEs clustered at the village in parentheses. All specifications contain children's age in months indicators and village indicators and control for child's sex, mother's age, whether a mother is married, and household size. Sample consists of all children with nonmissing EASQ and LAZ.

* $P < 0.05$.

[†] $P < 0.01$.

[‡] $P < 0.10$.

[§]Gives the P value on a test of joint significance of the wealth categories.

[¶]Gives the P value on a test of joint significance of the education categories.

^{||}Total wealth effect comes from a regression model similar to the one reported in the table but without the LAZ. Wealth effect refers to the comparison in EASQ z scores of families in the fifth wealth quintile with families in the first quintile.

**Indirect wealth effect is the change in the wealth effect after adding the LAZ.

^{††}Total education effect comes from a regression model similar to the one reported in the table but without LAZ. Education effect refers to the comparison in EASQ z scores of children with mothers with more than 9 y of schooling with children with mothers with no schooling. The exception is Senegal, where the education effect compares mothers with some schooling with mothers with no schooling.

^{**}Indirect education effect is the change in the education effect after adding LAZ.

