

Child Development in Low- and Middle-Income Countries

Marc H. Bornstein^a, PhD, W. Andrew Rothenberg^b, PhD, Jennifer E. Lansford^b, PhD,
Robert H. Bradley^c, PhD, Kirby Deater-Deckard^d, PhD, Andrea Bizzego^e, PhD, and
Gianluca Esposito^{e,f}, PhD

Affiliations: ^a*Eunice Kennedy Shriver* National Institute of Child Health and Human Development, USA; UNICEF, USA; and Institute for Fiscal Studies, UK. 8404 Irvington Avenue, Bethesda MD 20817-3535, USA; ^bCenter for Child and Family Policy, Duke University, Box 90545, Durham, NC 27708, USA; ^cDepartment of Psychology, Arizona State University, 951 S. Cady Mall, Tempe, AZ 85287, USA; ^dPsychological and Brain Sciences, University of Massachusetts Amherst, 10 S. Sycamore Knolls, South Hadley, MA 01075, USA; ^eDepartment of Psychology and Cognitive Science, University of Trento, Corso Bettini, 31 - 38068 Rovereto, Italy; and ^fDepartment of Psychology, Nanyang Technological University, Singapore

Address correspondence to: Marc H. Bornstein, *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, 8404 Irvington Avenue, Bethesda MD 20817-3535, USA. [marc.h.bornstein@gmail.com] 1-301-656-1642 or 1-240-480-0586

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Abbreviations: ECDI: Early Child Development Index; HDI: Human Development Index; LMICs: low- and middle-income countries

Table of Contents Summary: Nationally representative data from 159,959 children in 51 low- and middle-income countries document the role of national-level indicators in individual children's mental and socioemotional development.

What's Known on This Subject:

Family sociodemographic variables are thought to predict child development, but less is understood about how indicators of national development affect child development in low- and middle-income countries. Such knowledge holds clinical and policy applications for United Nations' Sustainable Development Goals.

What This Study Adds:

National development indicators (health, education, income) relate linearly to children's literacy-numeracy, socioemotional development, and approaches to learning in nationally representative samples in 159,959 children from 51 low- and middle-income countries, even controlling for numerous sociodemographic and demographic confounders.

49 **Contributors' Statement:**

50 *Drs Marc H. Bornstein and W. Andrew Rothenberg conceptualized and designed the study, carried out*
51 *the data analyses, drafted the initial manuscript, and reviewed and revised the manuscript.*

52 *Drs Jennifer E. Lansford, Robert M. Bradley, Kirby Deater-Deckard, Gianluca Esposito, and Andrea*
53 *Bizzego reviewed and revised the manuscript and critically reviewed the manuscript for important*
54 *intellectual content.*

55 *All authors approved the final manuscript as submitted and agree to be accountable for all aspects of*
56 *the work.*

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Abstract

Background: The United Nations created the Multiple Indicator Cluster Survey (MICS) to monitor progress toward achieving goals of the World Declaration on the Survival, Protection, and Development of Children and its Plan of Action. The MICS is nationally representative and internationally comparable.

Methods: This study uses MICS data from 51 low- and middle-income countries (LMICs) on 159,959 children between 36 and 59 months of age. To index national development, the 2013 UN Human Development Index (HDI) provides data on country-level life expectancy, education, and income. To index child development, the Early Child Development Index (ECDI) assesses literacy and numeracy, socioemotional development, physical health, and approaches to learning.

Results: Children's literacy-numeracy, socioemotional development, and approaches to learning all increase linearly as national development on the HDI (especially education) increases.

Overall, the HDI showed a positive association ($r = .40$) with the ECDI: The HDI explained 16% of variance in children's ECDI scores and was the most influential predictor of ECDI scores examined. HDI-ECDI relations are robust even controlling for multiple demographic aspects of children (age, gender), mothers (age, education), and households (size variables) as covariates. No family demographic variable was a stronger predictor of child development than national development.

Conclusions: To promote child development, LMICs need to develop and implement policies that ensure national health and wealth but particularly the educational achievements of children's caregivers. These findings are faithful to the World Summit for Children and inform the United Nations' Sustainable Development Goals that drive international development agenda through 2030.

Introduction

The United Nations created the Multiple Indicator Cluster Survey (MICS) in 1990 at the World Summit for Children to monitor the progress of nations toward achieving goals of the World Declaration on the Survival, Protection, and Development of Children and its Plan of Action. The MICS is a nationally representative and internationally comparable household survey. Rounds 4 and 5 of the MICS, carried out between 2009 and 2017, included 10 questions that construct an Early Child Development Index (ECDI). The ECDI asks about four domains of child development: literacy and numeracy, socioemotional development, physical health, and approaches to learning. The Human Development Index (HDI) is a composite indicator of a country's status based on national indicators of health (captured as life expectancy), education

(captured as literacy rate), and income (captured as gross domestic product). Thirty years on, the present study addresses how country-level indicators of human development (HDI) relate to child development (ECDI) in 159,959 children between 36 and 59 months of age from 51 low- and middle-income countries (LMICs).

Higher socioeconomic status is related to better child adjustment.^{1,2} For example, higher parental education,³ greater income,⁴ and even subjective factors such as perceptions of relative socioeconomic standing⁵ all are related to children's academic achievement and behavioral adjustment. Socioeconomic factors related to children's adjustment within a given country can also be conceptualized in an international comparative framework. For example, a national-level construct that parallels parental education might be societal literacy rate or rate of school enrollment at different ages. Likewise, gross domestic product might be a national-level construct parallel to household income. Countries differ widely in these national-level indicators.

To date, socioeconomic factors in an international framework have been considered in relation to children's adjustment primarily in terms of child survival and physical health. For example, rates of infant and child morbidity and mortality are dramatically higher in poorer than in richer nations.⁶ A high level item of the international agenda with respect to child rights involves eradicating poverty. The top goal in both the Millennium Development Goals and the Sustainable Development Goals set forth by the United Nations is "Eradicating poverty in all its forms."⁷ The major aim of the present study is to understand how country-level indicators of human development, captured as life expectancy, education, and income, are related to children's development extending beyond survival and physical health to literacy-numeracy, socioemotional development, and approaches to learning.

Method

116 **Participants**

117 The data reported here come from the UNICEF Multiple Indicator Cluster Survey (MICS),
 118 rounds 4 (MICS4) and 5 (MICS5), carried out between 2009 and 2017. Participant selection and
 119 data collection were conducted via standardized procedures established by UNICEF, codified in
 120 MICS manuals,^{8,9} and conveyed to enumerators in each nation during regional workshops. Each
 121 country selected a nationally representative probability sample by dividing itself into
 122 proportionately-populated regions and randomly selecting participants within each region as
 123 detailed in MICS manuals.^{8,9} In each nation, pairs of UNICEF-trained fieldworkers interviewed
 124 household members at their homes using standardized MICS4 and MICS5 questionnaires and
 125 recording answers on portable computer devices. Data were then double entered, with built-in
 126 internal consistency checks to ensure accuracy, and subsequently archived centrally. A UNICEF
 127 MICS team oversaw data collection and aggregation and was available to consult with national
 128 governments at any time. Global MICS4 and MICS5 evaluations confirmed the entire MICS
 129 procedure was of high quality and captured accurate data.^{8,9}

130 Data were collected in 51 low- and middle-income countries (LMICs) on 159,959 children
 131 between 36 and 59 months of age ($M = 47.3$ months, $SD = 6.9$). Table 1 names the countries and
 132 gives their sample sizes and locations. The total sample was evenly divided with 50.7% of
 133 children boys and 49.3% girls. Respondents to the MICS4 and MICS5 identified the person who
 134 served in the role of the child's primary caregiver, called here "mother." Mothers were almost
 135 always the child's biological mother but might include some adoptive mothers, stepmothers,
 136 aunts, grandmothers, and foster mothers. Mothers averaged 32.0 years old ($SD = 8.9$). Mothers'
 137 educational achievements varied: 27.9% reported receiving no formal education, 28.4% reported
 138 receiving primary education, 32.4% reported receiving secondary education, and 11.2% reported
 139 receiving higher education.

LMICs¹⁰ were defined with reference to the World Bank¹¹ system of classification of economies based on gross national incomes per capita, quality of life (life expectancy, literacy rates), and economic diversification (labor force, consumption). Although 70 LMICs conducted the MICS4 and MICS5, data from 51 LMICs were used here. Nineteen countries were excluded because they did not include questions that contained data pertinent to these analyses. HDI scores for excluded countries did not significantly differ from the 51 included countries. The 51 LMICs represent 17 countries from Africa, 12 countries from Asia, 9 countries from North America, 8 countries from Europe, and 5 countries from South America.

Human Development Index

The 51 LMICs represent a range of human development conditions, as measured by the United Nations' Human Development Index (HDI¹²), a 0 (low) to 1 (high) composite indicator of a country's status on three dimensions. The composite includes indicators of health (captured by the Life Expectancy subindex; LEI), education (captured by the Education subindex; EDI), and income (captured by the Income subindex, INI). Table 1 gives each country's HDI. HDI Scores $\leq$.550 indicate low human development, .550-.699 indicates medium human development, .700-.799 indicates high human development, and $\geq$.800 indicates very high human development. Of the 51 LMICs, 14 fell in the low, 14 in the medium, 20 in the high, and 3 in the very high category on the 2013 Human Development Index.¹²

Childhood Development Index

Both MICS4 and 5 contained several different questionnaires.^{8,9} The Questionnaire for Children under Five is composed of sets of standardized questions about all children under 5 years of age in a household.¹³ Ten questions asked if target milestones of child development have been observed. These 10 questions, collectively called the Early Childhood Development Index

(ECDI¹⁴), were developed by UNICEF specifically to assess development in children ages 36 to 59 months in four domains plus a total score.¹⁴ The four domains of child development include literacy-numeracy development (to identify, know, and use numbers, letters, and words), socioemotional development (to recognize and appropriately express thoughts and feelings and interact well with others), physical health development (physically grow, avoid rampant sickness or disease, and develop gross and fine motor abilities), and approaches to learning (to follow directions to achieve goals and complete tasks independently). The overall child development score is the combination of child literacy-numeracy, socioemotional, physical health, and approaches to learning.¹⁴ These five measures of child development have been identified as critical to evaluating child health and well-being and ensuring that the world achieves the United Nations' Millennium Development Goals, World Fit for Children Declaration and Plan of Action goals, and Sustainable Development Goals.^{9,10,14} Furthermore, UNICEF also designates a child as being "on-track" when the child passes 2 of 3 items in literacy and numeracy development and in socioemotional development and 1 of 2 items in physical health development and in approaches to learning; children are "on track" in their overall development if they are on-track in at least 3 of the 4 developmental domains (for details see the SI).

Analytic Plan

Three analyses are reported below. First, correlations of the HDI and subindices with ECDI scores and subindices are examined. Second, partial correlations that capture the unique association between an HDI subindex and child development scores controlling for the effects of other HDI subindices are examined. Third, regression models of the HDI score as a predictor of ECDI scores after controlling for numerous child, mother, household, and country demographic covariates are examined.

186 Results

187 The Human Development Index (HDI) and its constituent indices were strongly and positively
 188 associated with the Early Child Development Index (ECDI) and its constituent indices (Table 2).
 189 All associations exceed a statistical cut-off indicating effects of practicable significance ($r = .10$),
 190 and many associations fall in the medium effect-size ($r = .30$) range.¹⁵ Notably, overall HDI
 191 showed a strong positive association ($r = .40$) with the ECDI: The HDI explained 16% of
 192 variance in children's ECDI scores and was the most influential predictor of ECDI scores
 193 examined. In other words, countries that create more optimal conditions for human development
 194 in terms of increasing life expectancy, access to education, and income have children who are
 195 more optimally developed in terms of their literacy and numeracy, socioemotional development,
 196 physical health, and approaches to learning. The linear association between HDI and ECDI is
 197 graphed in Figure 1: Countries with higher HDI have children who score higher on the ECDI.
 198 Figure 1 also shows that this trend holds in the different UN-designated groupings of countries on
 199 the HDI. Countries that the UN categorizes in the "low human development" group are clustered
 200 in the lower left of the graph (as circles), where both human development scores and child
 201 development scores are low. Countries categorized by the UN as being in the "high human
 202 development group" are in the upper right of the graph (as squares), where both human
 203 development scores and child development scores are high. Furthermore, only approximately 5 in
 204 10 (54.6%) children in countries from the "low human development" group met UN criteria for
 205 being on-track in their development,¹⁴ whereas 7 in 10 (73.0%) children in countries with
 206 "medium human development" did, more than 8 in 10 (84.5%) children in countries with "high
 207 human development" did, and nearly 9 in 10 (89.8%) children in countries with "very high
 208 human development" did.

209 Higher human development scores are related to higher child development scores. Moreover,

210 each component of the HDI supports child development beyond what other HDI components
 211 afford. Table 2 shows associations between the LEI (HDI Life Expectancy Index), EDI (HDI
 212 Education Index), and INI (HDI Income Index) and child development indices after controlling
 213 for associations between the other two HDI subindices and child development. So, for instance,
 214 the partial correlation in the upper left ($r_{\text{partial}} = .11$) indicates the unique correlation between the
 215 Life Expectancy Index and the Early Child Development Index after taking into account the
 216 correlations between the EDI and INI with the ECDI. As can be seen, all three indices are
 217 significantly and uniquely associated with both overall child development and the four subindices
 218 of child development. Nations creating better conditions for their populations' longer life
 219 expectancy, more education, and more wealth are each uniquely associated with overall child
 220 development in the population as well as the nation's children's development of literacy-
 221 numeracy, socioemotional health, physical health, and approaches to learning.

222 Each component of the HDI uniquely supports children's development, but a country's
 223 educational index score matters the most for overall child development, literacy and numeracy
 224 development, and physical health development. The unique EDI associations with these three
 225 child development scales are highest: Higher scores on the education index are associated with
 226 greater overall child development, literacy and numeracy development, and physical health
 227 development. For socioemotional development and approaches to learning, a nation's life
 228 expectancy index matters the most: Countries that create conditions for long life have children
 229 with greater socioemotional development and who develop better approaches to learning.

230 These analyses focused on associations between country-level indices, *viz.* the HDI and its
 231 constituents and the ECDI and its constituents. Additional analyses show that child and mother
 232 sociodemographic, and household and country demographic, characteristics also correlate with
 233 child development indices. Table SI 1 gives results where all sociodemographic and demographic

characteristics are simultaneously used in regression models to predict child development scores. Even after accounting for these several covariates, the HDI still emerges as the most powerful predictor of the ECDI. These results are described in greater detail in the Supplemental Information subsection titled Simultaneous Associations between All Demographic Characteristics and Early Child Development Indices in a Linear Regression Framework. In summary, the higher the national status of a country on the HDI (and especially the Education Index) the greater are children's literacy-numeracy development, socioemotional development, physical health, and approaches to learning development. These relations were strong and linear and held even taking into consideration multiple aspects of children, mothers, and households as covariates. No family demographic variable was a stronger predictor of child development than national human development index scores.

Discussion

This investigation examined human development at the county level and child development scores in almost 160,000 families in 51 low- and middle-income countries (LMICs). We found that country Human Development Index (HDI) scores are strongly and consistently associated with many Early Child Development Indexes (ECDI). In both the correlation analyses and the regression analyses (in the SI), HDI scores were the strongest and most robust predictors of overall ECDI scores. Nations with higher human development scores had higher levels of child development (Figure 1). All three subindices that compose a country's HDI score (life expectancy, education, and wealth) uniquely contributed to all four domains of early child development; however, of the three subindices of the HDI, education emerged as the strongest unique predictor of overall early child development scores, child literacy and numeracy scores,

and child physical health scores. Additionally, life expectancy was the strongest predictor of child socioemotional development and approaches to learning scores.

Similar analyses using MICS4 data from 97,731 children from 35 LMICs found that mean child development scale scores were higher in high-HDI countries compared to low-HDI countries.¹⁶ The present analyses examine almost 160,000 children from 51 LMICs with MICS4 and MICS5 data and so replicate and build on findings from prior research by demonstrating that HDI scores uniquely predict child development and do so even after controlling for numerous other child and mother sociodemographic and household demographic covariates (see the SI). Previous work¹⁶ investigated associations between overall HDI score and overall child development. The present analyses extend that work by reporting associations of specific HDI indices (i.e., life expectancy, education, and income) with specific categories of ECDI (i.e., literacy and numeracy, socioemotional development, physical health, and approaches to learning).

Countries with higher HDI scores tend to invest more in sanitation, welfare, housing, educational, and nutritional systems that promote healthy child development. Such nations are also likely to have more highly developed policy infrastructures that promote sensitive caregiving through parent access to educational materials, greater dissemination of parent knowledge about adaptive parenting practices, and promotion of parent time and effort investment in their children.

Subsequent work can further explore how high HDI scores may manifest their effects in child development through parent caregiving. For now, these findings indicate that no demographic variable appears to be a better or stronger predictor of early child development than national development index scores.

As powerful as HDI scores (and child and maternal factors; see the SI) are in predicting child development scores, heterogeneity within countries and factors not captured with precision by the

HDI may also play roles in child development. In essence, important factors that promote child development worldwide remain unstudied. Specifically, the factors identified in Table S1 account for an impressive, nearly large effect size but still explain only one-quarter of the variance in child development scores. Over three-quarters of the variance in overall child development scores was not explained. It is likely that direct proximal caregiving explains more variance in child development scores across the majority world.¹⁶⁻¹⁹

Strengths and Limitations

The MICS provides the fields of parenting and developmental science as well as policy and intervention with unique and bountiful data. However, its limitations need to be acknowledged vis-à-vis its strengths. A distinct advantage of MICS data is that an impressive number of inhabitants in a substantial number of under-researched LMICs are represented. Therefore, MICS data shine much-needed light on early child development in areas of the world underrepresented in current theory, research, and policy.^{13, 20, 21} Yet, MICS sample sizes vary considerably across countries, not all countries provide all data (even with 51 LMICs represented the data set falls far short of worldwide representation), and comparable data from high-income countries are missing. Due to the large sample size, appropriately conservative effect size approaches were adopted here to interpret the statistical results. An additional strength of the MICS is its nationally representative sampling and data collection by well-trained national civil workers, demographers, and enumerators.^{8,21} The unit of analysis used across MICS surveys is country,^{8,9} and the sheer number of countries in this rich data set precludes reference to individual national and cultural literatures. For this reason, we appealed to the HDI as a cross-national organizing and comparative construct. Consequently, these analyses focus on between-, not within-, country patterns, which of course can be expected to vary considerably both within and across samples.^{22,23}

Mothers reported on MICS measures used in these analyses, so perspectives from other family members, including fathers are not included. Given that mothers, fathers, and other caregivers as well as children each may have different perspectives on child development that likely generates disparate reports on children,²⁴⁻³⁰ mono-reporter bias is a limitation of the current approach and analyses. MICS indicators are also cross-sectional (precluding causal interpretations) and subject to historical time as well as seasonality effects. These limitations on MICS data moderate their explanatory potential.¹³

Conclusions

Despite these limitations, MICS data provide an unprecedented opportunity to examine how the development of a country in terms of health, education, and wealth shapes multiple different aspects of child development on a global scale. Following UNICEF's aspirations, policy makers may use MICS data to create a better world for children by reducing vulnerabilities and building on strengths in national income, life expectancy, and especially education.^{12, 21}

316 References

- 317 1. Piotrowska PJ, Stride CB, Croft SE, Rowe R. Socioeconomic status and antisocial behavior
318 among children and adolescents: A systematic review and meta-analysis. *Clin Psychol Rev.*
319 2015;35:47-55. doi: 10.1016/j.cpr.2014.11.003.
- 320 2. Wachs TD, Cueto S, Yao H. More than poverty: Pathways from economic inequality to
321 reduced developmental potential. *Int J Behav Dev.* 2016;40:536-543. doi:
322 10.1177/0165025416648231.
- 323 3. Davis-Kean PE, Tang S, Waters NE. Parent education attainment and parenting. In: Bornstein
324 MH, ed. *Handbook of Parenting*. Vol 2. 3rd ed. Biology and Ecology of Parenting.
325 Routledge/Taylor & Francis Group; 2019:400-420. doi: 10.4324/9780429401459-12
- 326 4. Yeung WJ, Linver MR, Brooks-Gunn J. How money matters for young children's
327 development: Parental investment and family processes. *Child Dev.* 2002;73:1861-1879. doi:
328 10.1111/1467-8624.t01-1-00511
- 329 5. Goodman E, Maxwell S, Malspeis S, Adler N. Developmental trajectories of subjective social
330 status. *Pediatrics.* 2015;136:633-640. doi: 10.1542/peds.2015-1300
- 331 6. UNICEF. State of the World's Children UNICEF.
332 <https://www.unicef.org/media/89221/file/SOWC%202014.pdf>. Accessed June 28, 2021.
- 333 7. United Nations Development Program. The SDGs in Action. [http://www.undp.org/sustainable-](http://www.undp.org/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=Cj0KCQjw5uWGBhCTARIsAL70sLLSeE-loQ7HJDWR_sAqffneYjwBBKMYX9DSfDacY_5a5glBiv4CR2EaAr5SEALw_wcB-no-poverty)
334 [development-goals?](http://www.undp.org/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=Cj0KCQjw5uWGBhCTARIsAL70sLLSeE-loQ7HJDWR_sAqffneYjwBBKMYX9DSfDacY_5a5glBiv4CR2EaAr5SEALw_wcB-no-poverty)
335 [utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English](http://www.undp.org/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=Cj0KCQjw5uWGBhCTARIsAL70sLLSeE-loQ7HJDWR_sAqffneYjwBBKMYX9DSfDacY_5a5glBiv4CR2EaAr5SEALw_wcB-no-poverty)
336 [&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=Cj0KCQjw5uWGBh](http://www.undp.org/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=Cj0KCQjw5uWGBhCTARIsAL70sLLSeE-loQ7HJDWR_sAqffneYjwBBKMYX9DSfDacY_5a5glBiv4CR2EaAr5SEALw_wcB-no-poverty)
337 [CTARIsAL70sLLSeE-](http://www.undp.org/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=Cj0KCQjw5uWGBhCTARIsAL70sLLSeE-loQ7HJDWR_sAqffneYjwBBKMYX9DSfDacY_5a5glBiv4CR2EaAr5SEALw_wcB-no-poverty)
338 [loQ7HJDWR_sAqffneYjwBBKMYX9DSfDacY_5a5glBiv4CR2EaAr5SEALw_wcB - no-](http://www.undp.org/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=Cj0KCQjw5uWGBhCTARIsAL70sLLSeE-loQ7HJDWR_sAqffneYjwBBKMYX9DSfDacY_5a5glBiv4CR2EaAr5SEALw_wcB-no-poverty)
339 [poverty](http://www.undp.org/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=Cj0KCQjw5uWGBhCTARIsAL70sLLSeE-loQ7HJDWR_sAqffneYjwBBKMYX9DSfDacY_5a5glBiv4CR2EaAr5SEALw_wcB-no-poverty). Accessed June 28, 2021.
- 340 8. UNICEF. Multiple Indicator Cluster Survey 4 Manual. [http://mics.unicef.org/tools?](http://mics.unicef.org/tools?round=mics4)
341 [round=mics4](http://mics.unicef.org/tools?round=mics4). Accessed June 28, 2021.
- 342 9. UNICEF. Multiple Indicator Cluster Survey 5 Manual. [http://mics.unicef.org/tools?](http://mics.unicef.org/tools?round=mics5)
343 [round=mics5](http://mics.unicef.org/tools?round=mics5). Accessed June 28, 2021.
- 344 10. UNICEF. Progress for Children: A World Fit for Children Statistical Review.
345 <http://reliefweb.int/report/world/progress-children-world-fit-children-statistical-review>.
346 Accessed June 28, 2021.
- 347 11. World Bank. How Does the World Bank Classify Countries?
348 [http://datahelpdesk.worldbank.org/knowledgebase/articles/378834-how-does-the-world-bank-](http://datahelpdesk.worldbank.org/knowledgebase/articles/378834-how-does-the-world-bank-classify-countries)
349 [classify-countries](http://datahelpdesk.worldbank.org/knowledgebase/articles/378834-how-does-the-world-bank-classify-countries). Accessed June 28, 2021.
- 350 12. United Nations Development Program. Human Development Report 2014: Sustaining Human
351 Progress: Reducing Vulnerabilities and Building Resilience.
352 <http://hdr.undp.org/sites/default/files/hdr14-report-en-1.pdf>. Accessed June 28, 2021.
- 353 13. Bornstein MH. Child development in developing countries: Introduction and methods. *Child*
354 *Dev.* 2012;83:16-31. doi: <https://doi.org/10.1111/j.1467-8624.2011.01671.x>
- 355 14. UNICEF. Development of the Early Childhood Development Index in MICS Surveys.
356 [http://mics.unicef.org/files?](http://mics.unicef.org/files?job=W1siZiIsIjIwMTcvMDkvMTUvMjEvMTUvNDMvMzc4L01JQ1NfTWV0aG9kb2xvZ2ljYWxfUGFwZXJfNi5wZGYiXV0&sha=85c096f0b2c5b0c8)
357 [job=W1siZiIsIjIwMTcvMDkvMTUvMjEvMTUvNDMvMzc4L01JQ1NfTWV0aG9kb2xvZ2](http://mics.unicef.org/files?job=W1siZiIsIjIwMTcvMDkvMTUvMjEvMTUvNDMvMzc4L01JQ1NfTWV0aG9kb2xvZ2ljYWxfUGFwZXJfNi5wZGYiXV0&sha=85c096f0b2c5b0c8)
358 [ljYWxfUGFwZXJfNi5wZGYiXV0&sha=85c096f0b2c5b0c8](http://mics.unicef.org/files?job=W1siZiIsIjIwMTcvMDkvMTUvMjEvMTUvNDMvMzc4L01JQ1NfTWV0aG9kb2xvZ2ljYWxfUGFwZXJfNi5wZGYiXV0&sha=85c096f0b2c5b0c8). Accessed June 28, 2021.
- 359 15. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Lawrence Erlbaum
360 Associates Inc; 1988.

16. Tran TD, Luchters S, Fisher J. Early childhood development: Impact of national human development, family poverty, parenting practices and access to early childhood education. *Child Care Health Dev.* 2017;43:415-426. doi: 10.1111/cch.12395
17. Bornstein MH, ed. *Handbook of Parenting*. 3rd ed. Routledge; 2019.
18. Rothenberg WA, Lansford JE, Bornstein MH, et al. Effects of parent warmth and behavioral control on adolescent externalizing and internalizing trajectories across cultures. *J Res Adolesc.* 2020;30:835-855. doi: 10.1111/jora.12566
19. Walker SP, Wachs TD, Gardner JM, et al. Child development: Risk factors for adverse outcomes in developing countries. *Lancet.* 2007;369:145-157. doi: 10.1016/S0140-6736(07)60076-2
20. Tomlinson M, Bornstein MH, Marlow M, Swartz L. Imbalances in the knowledge about infant mental health in rich and poor countries: Too little progress in bridging the gap. *Infant Ment Health J.* 2014;35:624-629. doi: 10.1002/imhj.21462
21. UNICEF. Monitoring the Situation of Children and Women for 20 Years: The Multiple Indicator Cluster Survey (MICS) 1995-2015. <http://54.92.12.252/files?job=W1siZiIsIjIwMTUvMDkvMTQvMTcvNTUvMzcvNTI2LzIwMTUwOTEyX01JQ1MyMF9XRUIucGRmIlld&sha=da0e0b8ac785c628>. Accessed June 28, 2021.
22. Deater-Deckard K. Within- and between-person and group variance in behavior and beliefs in cross-cultural longitudinal data. *J Adolesc.* 2018;62:207-217. doi: 10.1016/j.adolescence.2017.06.002
23. Lansford JE, Rothenberg WA, Bornstein MH, eds. *Parenting across Cultures across Development: Parenting from Childhood to Adolescence in Nine Countries*. Routledge; 2021.
24. Achenbach TM, Rescorla LA. Developmental issues in assessment, taxonomy, and diagnosis of psychopathology: Life span and multicultural perspectives. In: Cicchetti D, ed. *Developmental Psychopathology: Theory and Method*. Vol 1. 3rd ed. Wiley; 2016:46-93.
25. Ghriwati NA, Winter MA, Greenlee JL, Thompson EL. Discrepancies between parent and self-reports of adolescent psychosocial symptoms: Associations with family conflict and asthma outcomes. *J Fam Psychol.* 2018;32:992-997. doi: 10.1037/fam0000459
26. Reyes ADL. The validity of the multi-informant approach to assessing child and adolescent mental health. *Psychol Bull.* 2015;141:858-900. doi: 10.1037/a0038498
27. Reyes ADL, Henry DB, Tolan PH, Wakschlag LS. Linking informant discrepancies to observed variations in young children's disruptive behavior. *J Abnorm Child Psychol.* 2009;37:637-652. doi: 10.1007/s10802-009-9307-3
28. Jager J, Bornstein MH, Putnick DL, Hendricks C. Family members' unique perspectives of the family: Examining their scope, size, and relations to individual adjustment. *J Fam Psychol.* 2012;26:400-410. doi: 10.1037/a0028330
29. Jager J, Yuen CX, Bornstein MH, Putnick DL, Hendricks C. The relations of family members' unique and shared perspectives of family dysfunction to dyad adjustment. *J Fam Psychol.* 2014;28:407-414. doi: 10.1037/a0036809
30. Makol BA, Reyes ADL, Ostrander R, Reynolds EK. Parent-youth divergence (and convergence) in reports of youth internalizing problems in psychiatric inpatient care. *J Abnorm Child Psychol.* 2019;47:1677-1689. doi: 10.1007/s10802-019-00540-7

403 Table 1 Low- and middle income countries with number of children/households (N),
 404 geographical location (Continent), and 2013 Human Development Index (HDI 2013).

Country	N	Continent	HDI 2013
Algeria	5531	Africa	0.745
Argentina	3047	South America	0.820
Bangladesh	8767	Asia	0.575
Barbados	192	North America	0.796
Belarus	1406	Europe	0.804
Belize	783	North America	0.705
Bhutan	2403	Asia	0.589
Bosnia and Herzegovina	1026	Europe	0.747
Cameroon	2776	Africa	0.535
Central African Republic	3705	Africa	0.344
Chad	7011	Africa	0.397
Democratic Republic of Congo	4021	Africa	0.426
Costa Rica	912	North America	0.776
Cuba	2230	North America	0.765
Dominican Republic	7703	North America	0.713
El Salvador	2964	North America	0.671
Ghana	3024	Africa	0.577
Guinea Bissau	2919	Africa	0.440
Guyana	1309	South America	0.645
Iraq	13960	Asia	0.666
Jamaica	659	North America	0.726
Kazakhstan	4200	Asia	0.788
Kosovo	660	Europe	0.786
Kyrgyzstan	1778	Asia	0.658
Laos	4472	Asia	0.579
North Macedonia	553	Europe	0.743
Malawi	7664	Africa	0.461
Mali	6433	Africa	0.408
Mauritania	3690	Africa	0.508
Mexico	3340	North America	0.756
Moldova	720	Europe	0.693
Mongolia	3672	Asia	0.729
Montenegro	639	Europe	0.803
Nepal	2241	Asia	0.554
Nigeria	10151	Africa	0.519

Paraguay	1821	South America	0.695
St. Lucia	119	North America	0.733
Sao Tome and Principe	833	Africa	0.560
Serbia	2578	Europe	0.771
Sierra Leone	3599	Africa	0.419
State of Palestine	3217	Asia	0.679
Suriname	1271	South America	0.715
Swaziland	2129	Africa	0.572
Thailand	4214	Asia	0.728
Togo	1799	Africa	0.472
Tunisia	1163	Africa	0.723
Turkmenistan	1492	Asia	0.692
Ukraine	1897	Europe	0.745
Uruguay	747	South America	0.797
Vietnam	2628	Asia	0.675
Zimbabwe	3891	Africa	0.516

405 *Note.* HDI 2013 values are based on the 2013 HDI values downloaded from this United Nations
 406 Development Programme Website: [http://hdr.undp.org/en/content/latest-human-development-](http://hdr.undp.org/en/content/latest-human-development-index-ranking)
 407 [index-ranking](http://hdr.undp.org/en/content/latest-human-development-index-ranking) in November, 2018. Reported HDI values change slightly over time as the UN
 408 adjusts the HDI formula and revises old figures. In consequence, HDI 2013 values in Table 1
 409 may differ slightly from those reported in the original report of HDI 2013 values (¹⁰).

Table 2 Zero-Order and Partial Correlations Between the Human Development Index and its Constituents and the Early Child Development Index and its Constituents

	ECDI	ECDI-LN	ECDI-SE	ECDI-PH	ECDI-AL
HDI	.40	.24	.18	.23	.33
LEI	.37/.11	.21/.03	.17/.06	.20/.02	.33/.14
EDI	.39/.15	.23/.09	.16/.05	.24/.13	.31/.09
INI	.33/.05	.21/.05	.14/.02	.18/.02	.26/.02

Note. All correlations significant at $p < .01$. HDI = Human Development Index, LEI = Life Expectancy Index, EDI = Education Index, INI = Income Index. ECDI = Early Child Development Index, ECDI-LN = Early Child Development Index-Literacy and Numeracy, ECDI-SE = Early Child Development Index-Socioemotional, ECDI-PH = Early Child Development Index-Physical Health, ECDI-AL = Early Child Development Index-Approaches to Learning. Zero-order correlations to the left of the slash line; partial correlations to the right of the slash line. Partial correlations between LEI, EDI, and INI and ECDI-LN, ECDI-SE, ECDI-PH, and ECDI-AL control for associations of the other two indices. (*Mplus* was used to compute zero-order correlations, and SAS was used to compute partial correlations.)

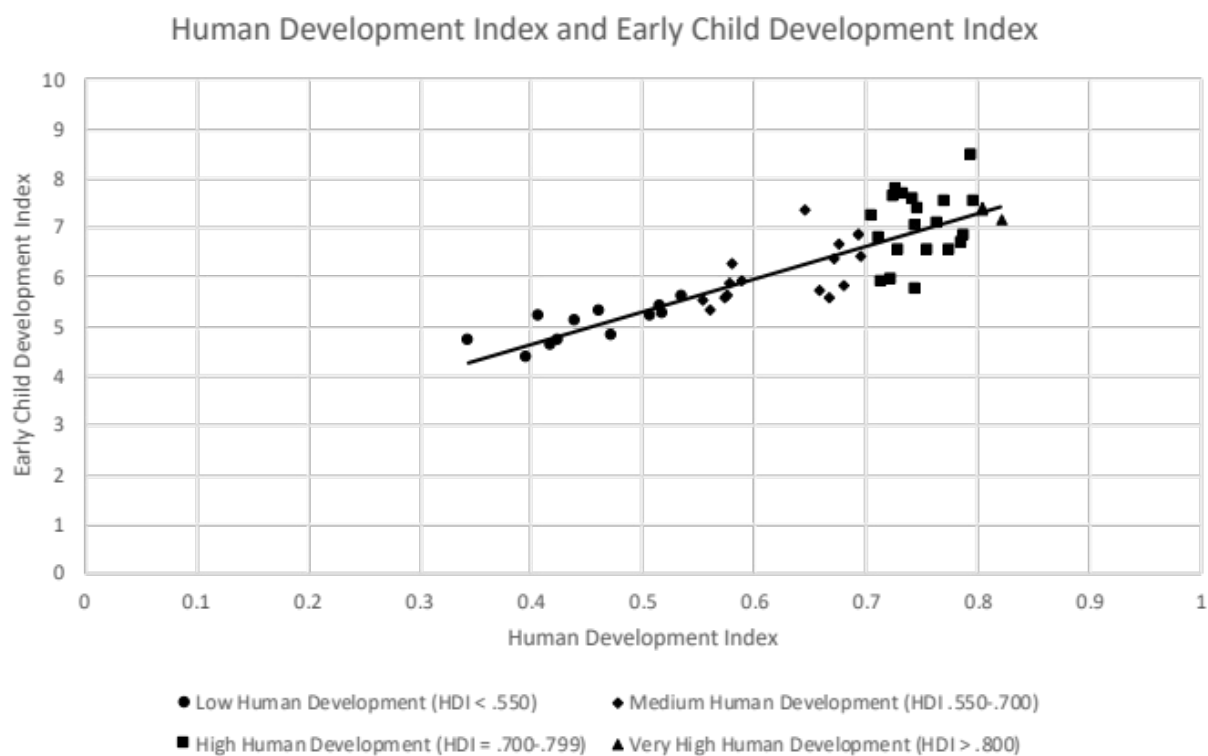


Figure 1 Linear Association between Human Development Index and Child Development Index Scores

Supplementary Information

ECDI “On-Track”

Ten questions in the MICS 4 and MICS 5 Questionnaire for Children under Five ask if target milestones of child development have been observed. These 10 questions, collectively called the Early Childhood Development Index (ECDI), were developed by UNICEF specifically to assess development in children ages 36 to 59 months in four developmental domains, including literacy-numeracy, socioemotional development, physical health, and approaches to learning. Based on the 10 questions, UNICEF ECDI scoring guidelines were developed and on that basis the Early Child Development Index-Literacy and Numeracy (ECDI-LN; 3 items), Early Child Development Index-Socioemotional Health (ECDI-SE; 3 items), Early Child Development Index-Physical Health (ECDI-PH; 2 items), and Early Child Development Index-Approaches to Learning (ECDI-AL; 2 items) subindices were calculated. Furthermore, according to UN criteria, children on track in their literacy and numeracy development must demonstrate at least 2 of the 3 behaviors; children “on track” in their socioemotional development must demonstrate at least 2 of the 3 behaviors; children “on track” in their physical health development must demonstrate at least 1 of the 2 behaviors; children “on track” in their approaches to learning development must demonstrate at least 1 of the 2 behaviors; and children “on track” in their overall development must demonstrate “on-track” development in at least three of the four ECDI-LN, ECDI-SE, ECDI-PH, and ECDI-AL developmental domains.

Simultaneous Associations between All Demographic Characteristics and Early Child Development Indices in a Linear Regression Framework

Child and mother sociodemographic and household and country demographic characteristics correlate with child development indices. Table SI 1 shows regression models where all sociodemographic and demographic characteristics are simultaneously used to predict child development scores. The total variance explained (R^2) in ECDI scores was calculated by the combination of all sociodemographic and demographic characteristics and is reported in the top row of Table SI 1. So, for instance, the model that used all demographic characteristics to predict total ECDI scores predicted 23.7% of the variance in ECDI scores. The change in R^2 (ΔR^2) in each model when a specific predictor was excluded was also calculated. So, for instance, the left-hand corner of Table SI 1 shows that, by removing the Human Development Index from the model predicting overall Early Child Development Index scores, the model explains 4.9% less variance in ECDI scores. Therefore, HDI scores uniquely explain 4.9% of variance in ECDI scores, even after controlling for the effects of all other sociodemographic and demographic variables. The ΔR^2 s do not completely add up to the total R^2 reported in the top row because the predictors are correlated with one another (e.g., number of people in household is correlated with number of children in household, and both are correlated with child development indices). The ΔR^2 controls for such correlations, and therefore all ΔR^2 s, when added, can differ from the total R^2 . Results for each early child development index are described below.

Taken together, sociodemographic and demographic characteristics predicted 23.7% of the

variance in overall Early Child Development Index scores. This amount of variance explained by sociodemographic and demographic characteristics alone falls between medium ($R^2 = .13$) and large ($R^2 = .26$) effect size.¹ Only three demographic predictors exceed the $R^2 = .02$ threshold that indicates even a small effect on Early Child Development Index scores. These three predictors are: the Human Development Index ($\Delta R^2 = .05$), mother education ($\Delta R^2 = .03$), and child age ($\Delta R^2 = .03$). Specifically, countries with higher HDI scores, mothers with higher levels of education, and older children had higher Early Child Development Index scores, even after controlling for all other demographic variables.

Sociodemographic and demographic characteristics predicted 15.5% of the variance in overall child literacy and numeracy development index scores (ECDI-LN), which is a medium effect. Only two sociodemographic predictors exceed the $R^2 = .02$ threshold that indicates even a small effect on early child development index scores. These two predictors are child age ($\Delta R^2 = .04$) and mother education ($\Delta R^2 = .04$). Specifically, older children and countries with mothers with higher levels of education had higher overall child literacy and numeracy development scores, even after controlling for demographic variables.

Sociodemographic and demographic characteristics predicted only 4.0% of the variance in overall child socioemotional development index scores (ECDI-SE), which is considered a small effect.¹ No demographic predictors exceeded the $R^2 = .02$ threshold for even a small effect (the HDI index came the closest at $\Delta R^2 = .02$).

Sociodemographic and demographic characteristics predicted 6.6% of the variance in overall child physical health development index scores (ECDI-PH), which is considered a small effect.¹ The Human Development Index score ($\Delta R^2 = .02$) is the one demographic predictor to exceed the $R^2 = .02$ threshold for a small effect. In nations where Human Development Index scores are higher, child physical health development scores are also higher.

Sociodemographic and demographic characteristics predicted 12.6% of the variance in child approaches to learning index scores (ECDI-AL), which falls between the small ($R^2 = .02$) and medium ($R^2 = .13$) effect size categories.¹ The Human Development Index score ($\Delta R^2 = .05$) is once again the sole predictor to exceed the $R^2 = .02$ threshold. Higher Human Development Index scores predict higher child approaches to learning development scores.

Child and Mother Sociodemographic and Household Demographic Associations with Child Development

In addition to country (HDI) demographic predictors of child development, the predictive power of two child (gender and age) and two mother (age and education) sociodemographic and four household (number of people in the household, number of children under age 18 in the household, number of children under age 5 in the household, and household crowding) demographic predictors were examined. With respect to child predictors, child age was the stronger and more robust predictor of child development. Of course, this association is perhaps an intuitive finding: As children grow older, they more readily identify letters and numbers and generally display more sophisticated levels of socioemotional, physical, and cognitive/learning development.² Nevertheless, the result is useful and supports the validity of MICS data to

document that child aging, even in so short a time period as 2 years, conveys clear developmental power across a variety of heretofore understudied LMICs (low- and middle-income countries). In contrast to the robust effects of child age, associations of child gender with child development were weak and negligible. In the 51 LMICs examined here, child development in girls and boys in this age range does not differ much. These results replicate the general pattern of “gender similarities” findings from more than 45 meta-analyses that have repeatedly demonstrated that effects of gender on most child developmental domains, including literacy-numeracy, socioemotional, physical development, and approaches to learning, are very small.³ These results also replicate and comport with those reported for child development and parental caregiving and discipline in 41 LMICs based on MICS3 data.⁴ However, these results expand on past largely high-income country (HICs) sample findings and past MICS child development and parenting findings by demonstrating that boys and girls appear to differ very little on more contemporaneous child development scores in LMICs as well.

With respect to mother sociodemographic characteristics, mother age was only weakly associated with child development scores. This finding is somewhat surprising given that numerous meta-analyses, systematic reviews, and nationally representative studies in HIC demonstrate that, generally, mothers who delay birth in those nations have children who demonstrate greater cognitive, socioemotional, and physical development and fewer school or behavioral problems.⁵⁻⁸ At least two explanations might elucidate the relatively small role that maternal age plays in child development in the current sample. First, and perhaps counter to expectations, mothers in this sample are not particularly young. The average mother age was 32 years, and only 7.7% of the sample had their children at age 18 or younger, when children suffer the greatest maladaptive developmental effects from early pregnancy and poorer parenting.⁹ The later childbearing age in our sample reflects global trends; teenage birth rates have fallen in virtually every world region since 2000-2005 and are especially pronounced in LMICs.⁹ This decline in teenage birth rates may itself reflect increases in global education, sex education, and widespread availability of affordable birth control. A second possible explanation for weak mother age effects may relate to the second parenting demographic characteristic measured here: maternal education. Specifically, data from HIC indicate that “...the primary pathway by which delaying first births benefits children is by enabling mothers to complete more years of schooling.”^{8(p 2229)} In other words, it may be that in HIC older mothers accrue more years of education, which leads to better child developmental outcomes. However, in the LMICs examined here, older mothers have not accrued the higher levels of education needed to promote child development, perhaps because educational opportunities are rarer to achieve. In the current sample, 56.3% of mothers reported either no formal education or only primary education. Therefore, in this sample mother education, as opposed to mother age, may be especially important in child development because it is not a given that older maternal age leads to higher levels of education. Indeed, mother education is a powerful and robust correlate of child development in this sample of more than 150,000 households in 51 LMICs. This finding aligns with systematic reviews from HIC that identify parent socioeconomic status, often most parsimoniously indexed by parent education,¹⁰ as one of the most powerful predictors of physical, cognitive, and socioemotional development in children.¹¹⁻¹⁴ Parents with higher levels of education are more likely to identify and have the means to utilize the nutritional, healthcare, housing, and cognitively stimulating resources necessary to promote child development.^{12,15} Parents with higher levels of education are also more likely to learn about effective, sensitive caregiving techniques and discipline behaviors that promote healthy child development.^{12,16,17} In sum, greater maternal education appears to be a

547 powerful tool for promoting multiple domains of child development, perhaps especially in
548 LMICs where such educational opportunities are more limited.

549 The four household demographic covariates (number of people in the household, number of
550 children under age 18 in the household, number of children under age 5 in the household, and
551 household crowding) had varying associations with child development. At the zero-order
552 correlational level, all four household variables had small negative correlations with most
553 measures of child development. Taken together, those findings indicate that households with
554 more people of all ages in them and less space have children with lower developmental scores.
555 However, the regression analyses revealed that none of these household characteristics predicts
556 more than .03% of variance in child development scores after other demographic covariates are
557 controlled.

558

559 **Supplementary References**

- 560 1. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Lawrence Erlbaum
561 Associates Inc; 1988.
- 562 2. Steinberg L, Vandell D, Bornstein MH. *Development: Infancy through Adolescence*.
563 Wadsworth; 2011.
- 564 3. Hyde JS. The gender similarities hypothesis. *Am Psychol*. 2005;60:581–592. doi:
565 10.1037/0003-066x.60.6.581.
- 566 4. Bornstein MH, Putnick DL, Bradley RH, Deater-Deckard K, Lansford JE. Gender in low- and
567 middle-income countries: I Introduction. *Monogr Soc Res Child Dev*. 2016;81:7–23. doi:
568 10.1111/mono.12223.
- 569 5. Bornstein MH, Putnick DL. Chronological age, cognitions, and practices in European
570 American mothers: A multivariate study of parenting. *Dev Psychol*. 2007;43:850–864. doi:
571 10.1037/0012-1649.43.4.850.
- 572 6. Bornstein MH, Putnick DL. *The Architecture of the Child Mind: G, Fs, and Their Hierarchy*.
573 Routledge;2019. <https://doi.org/10.4324/9780429027307-6>
- 574 7. Bornstein MH, Putnick DL, Suwalsky JTD, Gini M. Maternal chronological age, prenatal and
575 perinatal history, social support, and parenting of infants. *Child Dev*. 2006;77:875–892. doi:
576 10.1111/j.1467-8624.2006.00908.x.
- 577 8. Duncan GJ, Lee KTH, Rosales-Rueda M, Kalil A. Maternal age and child development.
578 *Demography*. 2018;55:2229–2255. doi: 10.1007/s13524-018-0730-3.
- 579 9. UNICEF. Early childbearing: The highest rates of early childbearing are found in sub-Saharan
580 African countries. <https://data.unicef.org/topic/child-health/adolescent-health/>
- 581 10. Bornstein MH, Hahn C-S, Suwalsky JTD, Haynes OM. Socioeconomic status, parenting, and
582 child development: The Hollingshead Four-Factor Index of Social Status and the Socioeconomic
583 Index of Occupations. In: Bornstein MH, Bradley RH, eds. *Socioeconomic Status, Parenting,*
584 *and Child Development*. Erlbaum;2003:29-82. doi: 10.4324/9781410607027.
- 585 11. Bornstein MH, Bradley RH, eds. *Socioeconomic Status, Parenting, and Child Development*.
586 Erlbaum;2003. doi: 10.4324/9781410607027.
- 587 12. Bradley RH, Corwyn RF. Socioeconomic status and child development. *Annu Rev Psychol*.
588 2002;53:371–399. doi: <https://doi.org/10.1146/annurev.psych.53.100901.135233>.
- 589 13. Davis-Kean PE, Tang S, Waters NE. Parent education attainment and parenting. In: Bornstein
590 MH, ed. *Handbook of Parenting*. Vol 2. 3rd ed. Biology and Ecology of Parenting.
591 Routledge/Taylor & Francis Group; 2019:400-420. doi: 10.4324/9780429401459-12
- 592 14. Hoff E, Laursen B. Socioeconomic status and parenting. In: Bornstein MH, ed. *Handbook of*
593 *Parenting*. Vol 2. 3rd ed. Biology and Ecology of Parenting. Routledge/Taylor & Francis Group;
594 2019:421-447. doi: 10.4324/9780429401459-12
- 595 15. Bornstein MH, Putnick DL, Bradley RH, Lansford JE, Deater-Deckard K. Pathways among
596 caregiver education, household resources, and infant growth in 39 low- and middle-income
597 countries. *Infancy*. 2015;20:353–376. doi: 10.1111/inf.12086.

- 598 16. Bornstein MH, Cote LR, Haynes OM, Hahn C-S, Park Y. Parenting knowledge: Experiential
599 and sociodemographic factors in European American mothers of young children. *Dev Psychol.*
600 2010;46:1677–1693. doi: 10.1037/a0020677.
- 601 17. Bornstein MH, Yu J, Putnick DL. Mothers' parenting knowledge and its sources in five
602 societies: Specificity in and across Argentina, Belgium, Italy, South Korea, and the United
603 States. *Int J Behav Dev.* 2020;44:135–145. doi: 10.1177/0165025419861440.
- 604

605

606 [Table SI](#) 1 Multiple Linear Regression Analyses Comparing the Simultaneous Associations of Child and Mother Sociodemographic and Household
607 and Country Demographic Characteristics with Early Child Development Indices

	ECDI ($R^2 = .24$)			ECDI-LN ($R^2 = .16$)			ECDI-SE ($R^2 = .04$)			ECDI-PH ($R^2 = .07$)			ECDI-AL ($R^2 = .13$)		
	β (SE)	p	ΔR^2	β (SE)	p	ΔR^2	β (SE)	p	ΔR^2	β (SE)	p	ΔR^2	β (SE)	p	ΔR^2
HDI	.27 (.00)	<.01	.049	.08 (.00)	<.01	.005	.15 (.00)	<.01	.015	.18 (.00)	<.01	.023	.27 (.00)	<.01	.051
Child Gender (0 = Female, 1 = Male)	-.05 (.00)	<.01	.003	-.03 (.00)	<.01	.001	-.07 (.02)	<.01	.004	.00 (.00)	.51	.000	-.02 (.00)	<.01	.000
Child Age (Months)	.17 (.00)	<.01	.027	.21 (.00)	<.01	.042	.03 (.00)	<.01	.000	.03 (.00)	<.01	.001	.09 (.00)	<.01	.008
Mother Age (Years)	.03 (.00)	<.01	.001	.03 (.00)	<.01	.001	.02 (.00)	<.01	.000	.01 (.00)	.07	.001	.01 (.00)	<.01	.000
Mother Education (0-3 Range)	.22 (.00)	<.01	.031	.25 (.00)	<.01	.042	.04 (.00)	<.01	.001	.09 (.00)	<.01	.005	.10 (.03)	<.01	.006
Number of People in Household	.03 (.01)	<.01	.000	.06 (.01)	<.01	.001	-.01 (.01)	.10	.000	-.03 (.01)	<.01	.001	.03 (.01)	<.01	.000
Number of Children in Household < 18 Years Old	-.01 (.01)	.02	.000	-.06 (.01)	<.01	.001	.01 (.01)	.03	.000	.04 (.01)	<.01	.001	.01 (.01)	.16	.000
Number of Children in Household < 5 Years Old	-.05 (.00)	<.01	.002	-.04 (.00)	<.01	.001	-.02 (.00)	<.01	.000	.00 (.00)	.21	.000	-.04 (.01)	<.01	.001
Household Crowding (Number of People Per Bedroom)	-.05 (.00)	<.01	.003	-.03 (.00)	<.01	.001	-.03 (.00)	<.01	.000	-.05 (.00)	<.01	.003	-.03 (.00)	<.01	.001

608 *Note.* HDI = Human Development Index, ECDI = Early Child Development Index, ECDI-LN = Early Child Development Index-Literacy and
609 Numeracy, ECDI-SE = Early Child Development Index-Socioemotional, ECDI-PH = Early Child Development Index-Physical Health, ECDI-AL =
610 Early Child Development Index-Approaches to Learning. ΔR^2 = Percent of variance uniquely added to model by variable standardized parameter
611 estimates are reported here. Bold values significant at $p < .05$.