Encouraging early childhood stimulation from parents and caregivers to improve child development

Last updated: April 2020

Evidence from 11 low- and middle-income countries shows that encouraging caregivers to play and interact with children aged 0–3 in a stimulating way improves children's cognitive development. These programs can increase the time and resources parents invest in their children's development. However, open questions remain on how to effectively deliver these programs at scale.



Trained home visitor reads with mother and children in Colombia

Photo: Marta Rubio-Codina

Summary

Available estimates suggest that 43 percent of children under 5 in low- and middle-income countries are at risk of not reaching their developmental potential [1], . Due to high levels of brain plasticity and neurogenesis, early childhood, from 0–5 years of age, is an extremely important period for long-term cognitive and psychosocial development [1], [2], [3].

Simple activities such as playing, reading, and singing with children are core components of early childhood stimulation (ECS). ECS can improve young children's ability to think, communicate, and connect with others [1], [4], . However, many children are not getting enough stimulation during this critical time [1]. Some of the most common ECS programs focus on encouraging caregivers to play with children: volunteers or community health workers visit caregivers at their homes or deliver group sessions in health clinics, homes, or other community spaces.

A review of 17 randomized evaluations from 11 low- and middle-income countries [1], finds that programs that teach and encourage caregivers to implement ECS with children aged 0–3 can improve the quality and quantity of play in children's home environments and can improve children's cognitive development. Whether the effects persist beyond the intervention period varies, however. In Jamaica, a small-scale study was able to follow participants for 20 years: it found that increased stimulation at home during early years led to long-term gains in cognition, academic achievement, employment, mental health, and adult earnings [5], [6], . In Colombia, impacts of a large-scale program on child development faded two years after the program ended [7]. ECS programs may have the greatest impacts for the most disadvantaged children, such as those who are stunted or underweight or have lower cognitive outcomes before an intervention. While results to date are overall promising, there are many open questions on how to deliver these programs at scale to sustain cognitive development, including how to best incentivize program facilitators and monitor programs to maintain quality implementation.

Supporting evidence

Programs promoting psychosocial stimulation between caregivers and children, delivered by trained individuals in one-on-one or group settings, improved developmental outcomes for children. In each program, staff encouraged mothers to play and interact with their children in ways that stimulate cognitive development and often promoted responsive parenting, using various implementation models (see Table 1,). All of the 16 studies that measured developmental outcomes found that these programs significantly improved child development in the short-term [8], [9], [10], [11], [12], [13], [14], [15], [16], [17], [18], [19], [20], [21], [22], [23], [24], . In one Jamaica study, stunted children who received the 24-month program had large improvements in cognitive, language, and motor development, including a 0.88 standard deviation increase in cognitive development [8], . In Bangladesh, child cognition improved by 1.3 standard deviations, in addition to large gains in language and motor skills [9], . Additional programs, including those in Antigua [13], , Bangladesh [14], [15], [16], [17], [18], , Colombia [11], [19] , China [10], , Ethiopia [20], , India [21], , Jamaica [13], [22], [23], , Mexico [12], , St. Lucia [13], , and Uganda [24], , had smaller impacts on developmental outcomes (0.15–0.55 standard deviations). The smaller impacts seen in most studies may have been due to implementation challenges [7], , focusing on a less disadvantaged population pre-intervention in terms of nutritional status or poverty level [7], [11], or less specific information in group meetings with children of broader age ranges [12], among others.

Programs to promote ECS can have the largest gains for children who are most disadvantaged. Children with malnutrition and/or low socioeconomic status at the start of an intervention may benefit most from increased stimulation at home. In Jamaica and Bangladesh, where short-term improvements in development were largest, programs were in low-income, disadvantaged neighborhoods and focused on stunted and underweight children, respectively [8], [9], . In the group model in Colombia, children's cognitive development in the poorest half of households increased by 0.22 standard deviations, while children in households with above average wealth in the study area saw no significant improvement [11], . In both China and Mexico, short-term impacts were greatest for children who had lower development at the start of the intervention [10], [11], . Results in Mexico were also driven by improvements in indigenous communities, where attendance at formal or informal preschools was lower at follow-up, and thus children were less likely to be receiving cognitive stimulation outside the home [12]. These results suggest that programs to encourage ECS at home may have larger impacts in contexts where children may already have developmental disadvantages.

Only one study to date has studied long-term impacts. It found that impacts persist into adulthood, leading to improved outcomes in school, employment, and earnings. In Jamaica, children in the small-scale ECS program continued to outperform children from the comparison group on IQ tests at 7, 11, 17, and 22 years of age [5], [6], [25], [26], [27], . In the most recent

follow-up at age 22, the average IQ was 0.6 standard deviations higher than the comparison group and individuals had attained, on average, 0.6 more years of schooling [5], [6], . Not only did children stay in school longer, but they also performed better: young adults who received ECS scored 25 and 27 percent higher than the non-stimulated group on standardized math and reading tests, respectively [5], . As they entered into full-time jobs, they earned 25 percent more than those in the comparison group [6], . ECS had positive socio-emotional impacts as well: adults who received the ECS program reported less depression and social inhibition and engaged in less violent behavior, but reported similar anxiety levels as those in the comparison group [5].

One large-scale study in Colombia has looked at the medium run [7]. Initial impacts on child development at the end of the program were smaller than in Jamaica, and two years after the program ended, impacts on child development had faded. Faded impacts may have been due to implementation difficulties, focusing on a less disadvantaged population, shorter program duration relative to the Jamaica study, or subsequent school engagement.

Pathways to Impact

Programs promoting ECS changed the way parents interacted with their young children at home and improved children's home environments. Eight studies found that parents who received these programs invested more time and resources in stimulating play activities for their children [6], [9], [10], [11], [21], [22], [24], [28], . In Jamaica, home visits led to a 16 percent higher score on a "home inventory index" than the comparison group, based on observations of parents' interactions with their children and specific aspects of the home environment [6], . Home visits in Colombia led families to invest in 21 percent more play materials, such as toys and books, relative to the comparison group [28], . Caregivers additionally spent 32 percent more time on educational activities with children and engaged in a greater diversity of activities such as telling stories, going for a walk, and spending time naming things. Additional programs in Bangladesh [9], , China [10], , Colombia [11], , India [21], , Jamaica [22], , and Uganda [24], also improved child stimulation at home. One study in South Africa found that mothers interacted with their children in a more sensitive and responsive way [29], . One study in Antigua, Jamaica, and St. Lucia found no impact on parental behavior [13]. However, this program showed short videos in health clinic waiting rooms and had shorter discussion, modeling, and practice of stimulating play.

Together, this evidence suggests that changes in children's home environments contributed to improved developmental outcomes, rather than having developmental improvements driven simply by direct stimulation from practice play sessions with parents led by program facilitators.

ECS programs can increase parental knowledge and understanding of child development. In seven studies from Antigua [13], , Bangladesh [9], [14], [16], , China [10], , Jamaica [13], [22], , St. Lucia [13], , and Uganda [24], , programs significantly increased parental knowledge of child development. For example, parenting programs increased parents' knowledge of child rearing and the importance of play by 0.4 standard deviations in three Caribbean countries [13], and 1.7 standard deviations in Bangladesh [9], . Two studies in Colombia and India found that the parenting intervention had no impact on maternal knowledge [11], [21], . Eight studies either did not measure or report impacts on parent knowledge [8], [12], [15], [17], [18], [19], [20], [29]. This evidence suggests that in most cases programs provided new information rather than solely reminding parents of the importance of ECS. These programs also emphasized practicing play activities to support the application of new knowledge.

There is limited evidence that ECS programs with caregivers impact maternal depression. Maternal depression has been associated with poor child development outcomes in several contexts and may impact child development through less sensitive or stimulating parenting practices [30], . On the one hand, some researchers and policymakers have posited that ECS programs may reduce maternal depression through empowering caregivers, changing perceived support, and increasing rewarding

interactions with children [14], [24]. On the other hand, without a specific focus on depression, ECS programs may not be enough to significantly improve maternal mental health.

Four of the eight studies measuring maternal mental health found that ECS programs did not impact maternal depression [9], [13], [14], [19], [21], [24], [29], [31], . Three studies in Bangladesh [9], , Colombia [19], , and Antigua, St. Lucia, and Jamaica [13], had no impact on maternal depression and still improved child development outcomes despite having substantial rates of maternal depression. For example, 37 percent of mothers were depressed at the start of the program in Colombia [28], . One study in South Africa with no impact on maternal depression did not measure child development outcomes but still saw improvements in mother-child interactions [29]. This evidence suggests that interactions with program facilitators focused on stimulating play with children may not be enough to consistently affect depression. Additionally, while maternal depression could impact other aspects of child health and is an important aspect of maternal health, it may not prevent improving ECS at home.

Barriers to Impact

Though ECS parenting programs hold tremendous potential, motivating consistent program delivery has proven challenging at scale. Three large-scale studies highlight that achieving and sustaining impact at scale requires persistent caregiver engagement as well as strong monitoring systems [7], [11], [12], . In two group session models in Mexico and Colombia, researchers believed program attendance was a key factor influencing impacts of the ECS programs [7], [12]. Understanding the motivations and barriers for participation is thus an important consideration for the potential success of a program at scale.

In a home-visiting program in Colombia where impacts faded two years after the intervention ended, staff turnover and reduced support for program staff[2], highlighted challenges of implementation at scale [7], . It is also possible only large impacts are sustained post-intervention or that effects could potentially become apparent later on, as the benefits may accrue over time [7]. Continuing to follow children involved in ECS programs is an important area of future research.

There are many open questions on how to best design interventions for cost-effective, sustainable shifts in parenting behavior and impact at scale. Leveraging existing government program infrastructure may be needed to scale up ECS programs, as was done in Antigua [13], , Bangladesh [9], , China [10], , Colombia [11], [19], , Jamaica [13], , Mexico [12], , and St. Lucia [13], . The results so far also highlight important tradeoffs across delivery models. Home-based delivery could be more accessible than group meetings, which are often delivered in a community center or health clinic [9], [11], . However, home-based delivery is also expensive and could be more difficult to scale [19], [23], . Group models could make mothers feel more comfortable or build more social support but should also consider how to motivate reliable attendance from participants [9], [11] , [14]. Given tradeoffs in accessibility, group delivery may be best suited for contexts in which attendance at health centers is already high.

More cost data is also vital to inform scaling decisions. In the programs reviewed here, cost information is available from five programs in Colombia [11], [19], , Jamaica [23], , and India [21] with different implementation models and costs ranging between US$134.40–$500 per child per year. Open questions remain on program duration/intensity, group versus individual meetings, the role of technology, at what age the intervention should begin, and how to incentivize and maintain high-quality implementation at a large scale.

Policymakers interested in improving early childhood development should consider programs that support parents and caregivers to invest more in stimulating play. These programs may be best targeted in areas where children are most disadvantaged, such as locations where there is a lack of other early childhood programs or where there are high rates of stunting or malnutrition. There may also be scope to incorporate these programs into existing social program infrastructure to potentially make implementation more feasible. Given the many questions on maintaining program quality at scale and

improving cost efficiency, more research is needed on how to best structure these programs to achieve long-term improvements in cognitive skills.

Sector chair(s) or Academic lead(s)

Joseph Doyle Pascaline Dupas Karen Macours

Insight author(s)

Caroline Tangoren

Abdul Latif Jameel Poverty Action Lab (J-PAL). 2020. "Encouraging early childhood stimulation from parents and caregivers to improve child development." J-PAL Policy Insights. Last modified April 2020. https://doi.org/10.31485/pi.2269.2020

---

1. Antigua and Barbuda, Bangladesh (6), China, Colombia (2), Ethiopia, India, Jamaica (3), Mexico, South Africa, St. Lucia, Uganda. See Table 1 for more details.
2. Face-to-face meetings every nine weeks were less frequent than other studies; see Table 1.

---

1. Black, Maureen M, Susan P Walker, Lia C. H. Fernald, Christopher T. Andersen, Ann M DiGirolamo & Sally Grantham-McGregor. 2016. “Early childhood development coming of age: science through the life course.” The Lancet, 389(10064), 77-90. Research Paper

2. Grantham-McGregor, Sally, Yin Bun Cheung, Santiago Cueto, Paul Glewwe, , Linda Richter, Barbara Strupp, and International Child Development Steering Group. "Developmental potential in the first 5 years for children in developing countries." The lancet 369, no. 9555 (2007): 60-70. Research Paper

3. Shonkoff, Jack P., Deborah A. Phillips, and National Research Council. "Neighborhood and community." In From neurons to neighborhoods: The science of early childhood development. National Academies Press (US), 2000. Research Paper

4. Nores, Milagros, and W. Steven Barnett. "Benefits of early childhood interventions across the world: (Under) Investing in the very young." Economics of education review 29, no. 2 (2010): 271-282. Research Paper

5. Walker, Susan, Susan Chang, Marcos Vera-Hernández, and Sally Grantham-McGregor. 2011. "Early Childhood Stimulation Benefits Adult Competence and Reduces Violent Behavior." Pediatrics 127 (5): 849–857. Research Paper

6. Gertler, Paul, James Heckman, Rodrigo Pinto, Arianna Zanolini, Christel Vermeerch, Susan Walker, Susan Chang-Lopez, and Sally Grantham-McGregor. 2014. "Labor Market Returns to an Early Childhood Stimulation Intervention in Jamaica." Science 344(6187): 998-1001. Research Paper, | J-PAL Evaluation Summary

7. Andrew, Alison, Orazio Attanasio, , Emla Fitzsimons, Sally Grantham-McGregor, and Costas Meghir, , and Marta Rubio-Codina. 2018. "Impacts 2 years after a Scalable Early Childhood Development Intervention to Increase Psychosocial Stimulation in the Home: A Follow-up of a Cluster Randomised Controlled Trial in Colombia.” PLOS Medicine, 15(4): e1002556. Research Paper, | J-PAL Evaluation Summary

8. Grantham-McGregor, Sally, Christine Powell, Susan Walker, and John Himes. 1991. "Nutritional Supplementation, Psychosocial Stimulation, and Mental Development of Stunted Children: The Jamaican Study." The Lancet 338 (8758): 1–5. Research Paper

9. Hamadani, Jena D., Syeda F Mehrin, Fahmida Tofail, Mohammad I Hasan, Syed N Huda, Helen Baker-Henningham, Deborah Ridout, & Sally Grantham-McGregor. 2019. “Integrating an early childhood development programme into Bangladeshi primary health-care services: an open-label, cluster-randomised controlled trial.” The Lancet Global Health, 7(3), e366-e375. Research Paper

10. Sylvia, Sean, Nele Warrinnier, Renfu Luo, Ai Yue, Orazio Attanasio, Alexis Medina, and Scott Rozelle. "From Quantity to Quality: Delivering a Home-based Parenting Intervention through China's Family Planning Cadres" Working Paper, November 2019.

11. Attansio, Orazio, , Helen Baker-Henningham, Raqel Bernal, Costas Meghir, , Diana Pineda, Marta Rubio-Codina."Early stimulation and nutrition: the impacts of a scalable intervention." NBER Working Paper, September 2018. Research Paper, | J-PAL Evaluation Summary

12. Fernald, L. C. H., Kagawa, R. M. C., Knauer, H. A., Schnaas, L., Guerra, A. G., & Neufeld, L. M. (2017). Promoting child development through group-based parent support within a cash transfer program: Experimental effects on children's outcomes. Developmental Psychology, 53(2), 222-236. Research Paper

13. Chang, Susan M., Sally M. Grantham-McGregor, Christine A. Powell, Marcos Vera-Hernández, Florencia Lopez-Boo, Helen Baker-Henningham, and Susan P. Walker. "Integrating a parenting intervention with routine primary health care: a cluster randomized trial." Pediatrics 136, no. 2 (2015): 272-280. Research Paper

14. Aboud, Frances E., Daisy R. Singla, Md Imam Nahil, Ivelina Borisova. 2013. "Effectiveness of a parenting program in Bangladesh to address early childhood health, growth and development" Social Science & Medicine, 97: 250-8. Research Paper

15. Aboud, Frances E., and Sadika Akhter. "A cluster-randomized evaluation of a responsive stimulation and feeding intervention in Bangladesh." Pediatrics 127, no. 5 (2011): e1191-e1197. Research Paper

16. Hamadani, Jena D. Syed N. Huda, Fahmida Khatun, Sally M. Grantham-McGregor. 2006. "Psychosocial stimulation improves the development of undernourished children in rural Bangladesh." Journal of Nutrition, 136(10): 2645-2652. Research Paper

17. Nahar, Baitun, M. I. Hossain, J. D. Hamadani, T. Ahmed, S. N. Huda, S. M. Grantham-McGregor, and L. A. Persson. "Effects of a community-based approach of food and psychosocial stimulation on growth and development of severely malnourished children in Bangladesh: a randomised trial." European Journal of Clinical Nutrition 66, no. 6 (2012): 701-709. Research Paper

18. Tofail, Fahmida, Jena D. Hamadani, Fardina Mehrin, Deborah A. Ridout, Syed N. Huda, and Sally M. Grantham-McGregor. "Psychosocial stimulation benefits development in nonanemic children but not in anemic, iron-deficient children." The Journal of nutrition 143, no. 6 (2013): 885-893. Research Paper

19. Attanasio, Orazio, , Camila Fernández, Emla Fitzsimons, Sally Grantham-McGregor, Costas Meghir, , and Marta Rubio-Codina. 2014. "Using the Infrastructure of a Conditional Cash Transfer Program to Deliver a Scalable Integrated Early Childhood Development Program in Colombia: Cluster Randomized Controlled Trial." BMJ 349:g5785. Research Paper, | J-PAL Evaluation Summary

20. Worku, Berhanu Nigussie, Teklu Gemechu Abessa, Mekitie Wondafrash, Johan Lemmens, Jan Valy, Liesbeth Bruckers, Patrick Kolsteren, and Marita Granitzer. "Effects of home-based play-assisted stimulation on developmental performances of children living in extreme poverty: a randomized single-blind controlled trial." BMC pediatrics 18, no. 1 (2018): 29. Research Paper

21. Andrew, Alison, Orazio Attanasio, , Britta Augsburg, Monimalika Day, Sally Grantham‐ McGregor, Costas Meghir, , Fardina Mehrin, Smriti Pahwa, and Marta Rubio‐ Codina. 2019. "Effects of a Scalable Home‐ Visiting Intervention on Child Development in Slums of Urban India: Evidence from a Randomised Controlled Trial." Journal of Child Psychology and Psychiatry. Research Paper, | J-PAL Evaluation Summary

22. Powell, Christine, Helen Baker-Henningham, Susan Walker, Jacqueline Gernay, and Sally Grantham-McGregor. "Feasibility of integrating early stimulation into primary care for undernourished Jamaican children: cluster randomised controlled trial." Bmj 329, no. 7457 (2004): 89. Research Paper

23. Walker, Susan P., Christine Powell, Susan M. Chang, Helen Baker-Henningham, Sally Grantham-McGregor, Marcos Vera-Hernandez, and Florencia López-Boo. Delivering parenting interventions through health services in the Caribbean: impact, acceptability and costs. No. IDB-WP-642. IDB Working Paper Series, 2015.

24. Singla, Daisy R., Elias Kumbakumba, and Frances E. Aboud. "Effects of a parenting intervention to address maternal psychological wellbeing and child development and growth in rural Uganda: a community-based, cluster-randomised trial." The Lancet Global Health 3, no. 8 (2015): e458-e469. Research Paper

25. Grantham-McGregor, Sally, Susan Walker, Susan Chang, and Christine Powell. 1997. "Effects of Early Childhood Supplementation With and Without Stimulation on Later Development in Stunted Jamaican Children." The American Journal of Clinical Nutrition 66 (2): 247–253. Research Paper

26. Walker, Susan, Sally Grantham-McGregor, Christine Powell, and Susan Chang. 2000. "Effects of Growth Restriction in Early Childhood on Growth, IQ, and Cognition at Age 11 to 12 Years and the Benefits of Nutritional Supplementation and Psychosocial Stimulation." The Journal of Pediatrics 137 (1): 36–41.

Research Paper

27. Walker, Susan, Susan Chang, Christine Powell, and Sally Grantham-McGregor. 2005. "Effects of Early Childhood Psychosocial Stimulation and Nutritional Supplementation on Cognition and Education in Growth-Stunted Jamaican Children: Prospective Cohort Study." The Lancet 366 (9499): 1804–1807. Research Paper

28. Attanasio, Orazio, , Sarah Cattan, Emla Fitzsimons, Costas Meghir, , Marta Rubio-Codina. 2020. "Estimating the Production Function for Human Capital: Results from a Randomized Control Trial in Colombia." American Economic Review 110(1): 48-85. Research Paper, | J-PAL Evaluation Summary

29. Cooper, Peter J., Mark Tomlinson, Leslie Swartz, Mireille Landman, Chris Molteno, Alan Stein, Klim McPherson, and Lynne Murray. "Improving quality of mother-infant relationship and infant attachment in socioeconomically deprived community in South Africa: randomised controlled trial." Bmj 338 (2009): b974. Research Paper

30. Walker, Susan P., Theodore D. Wachs, Sally Grantham-McGregor, Maureen M. Black, Charles A. Nelson, Sandra L. Huffman, Helen Baker-Henningham et al. "Inequality in early childhood: risk and protective factors for early child development." The lancet 378, no. 9799 (2011): 1325-1338. Research Paper

31. Baker-Henningham, Helen, Christine Powell, Susan Walker, and Sally Grantham-McGregor. "The effect of early stimulation on maternal depression: a cluster randomised controlled trial." Archives of disease in childhood 90, no. 12 (2005): 1230-1234. Research Paper