

# Jump-Starting Early Childhood Education at Home: Early Learning, Parent Motivation, and Public Policy

Perspectives on Psychological Science  
2015, Vol. 10(6) 727–732  
© The Author(s) 2015  
Reprints and permissions:  
sagepub.com/journalsPermissions.nav  
DOI: 10.1177/1745691615607064  
pps.sagepub.com



Erin A. Maloney<sup>1</sup>, Benjamin A. Converse<sup>2,3</sup>, Chloe R. Gibbs<sup>2,4</sup>,  
Susan C. Levine<sup>1</sup>, and Sian L. Beilock<sup>1</sup>

<sup>1</sup>University of Chicago, Department of Psychology; <sup>2</sup>University of Virginia, Frank Batten School of Leadership and Public Policy; <sup>3</sup>University of Virginia, Department of Psychology; and <sup>4</sup>University of Virginia, Curry School of Education

## Abstract

By the time children begin formal schooling, their experiences at home have already contributed to large variations in their math and language development, and once school begins, academic achievement continues to depend strongly on influences outside of school. It is thus essential that educational reform strategies involve primary caregivers. Specifically, programs and policies should promote and support aspects of caregiver–child interaction that have been empirically demonstrated to boost early learning and should seek to impede “motivational sinkholes” that threaten to undermine caregivers’ desires to engage their children effectively. This article draws on cognitive and behavioral science to detail simple, low-cost, and effective tools caregivers can employ to prepare their children for educational success and then describes conditions that can protect and facilitate caregivers’ motivation to use those tools. Policy recommendations throughout focus on using existing infrastructure to more deeply engage caregivers in effective early childhood education at home.

## Keywords

education, Head Start, motivation, parenting, self-regulation

In comparison with their more advantaged peers, children who are born into lower socioeconomic status (SES) families are falling behind in math and language development before they enter formal schooling (Duncan & Magnuson, 2013; Waldfogel & Washbrook, 2011). Primary and secondary education play an important role in mitigating these gaps, but opportunities for school-based intervention are constrained. Achievement gaps grow for 5–6 years before schools are involved, and children spend only about 6.5 hours per day for about half the year in school (U.S. Department of Education, 2008). Indeed, all school-level factors—teacher, classroom, and school attributes—account for only about 20% of student achievement, whereas individual demographics and family background account for approximately 60% of the variation (Goldhaber, 2002). As their children’s first and arguably most important teachers in the hours outside of school, parents or other adult caregivers must be part of any successful reform strategy. However, there is growing evidence that lower SES families face different challenges in engaging their children effectively in the home. Many caregivers may not

be doing everything they can—or even everything they would like—to optimize interactions with their children.

From prenatal support through the start of formal schooling, the federal government makes a substantial investment in early childhood education.<sup>1</sup> Many of these efforts already support families in effective ways, but there is substantial variance across programs in the amount and quality of caregiver engagement. By explicating the general behavioral principles that underlie children’s early learning and their caregivers’ motivation, findings from psychological science can guide policymakers in attempts to get the most out of existing early-childhood policy infrastructure. Drawing from

## Corresponding Authors:

Benjamin A. Converse, Frank Batten School of Leadership and Public Policy, University of Virginia, 235 McCormick Road, PO Box, 400893, Charlottesville, VA 22904  
E-mail: converse@virginia.edu

Erin A. Maloney, Department of Psychology, University of Chicago, 5848 S. University Avenue, Chicago, IL 60637  
E-mail: erinmaloney@uchicago.edu; maloney.erin@gmail.com

basic and field-intervention research, we offer policy recommendations that focus on (a) raising awareness at the program level about the many channels through which caregivers can effectively support child learning at home and (b) structuring environments that help caregivers follow through on their intentions to support their children's early math and language learning. Importantly, fitting these principles to the communities they serve can mitigate concerns about government overreach into an area as personal and culturally variable as parenting. Our sample policy implications (summarized in Table 1) focus on Head Start, the federal preschool program for disadvantaged children, because of the pronounced federal role in establishing performance standards and providing funding directly to Head Start programs,<sup>2</sup> but the policy implications could be tailored to other federal efforts as well.

### Caregivers Matter: The Evidence for Targeting “Parenting Behaviors”

A variety of at-home and in-lab studies of naturalistic caregiver-child interactions have identified specific qualities of interactions that promote later language and math thinking (see Table S1 in the Supplemental Material). These practices can be summarized by the idea of caregivers finding “TEACHing” channels, which include: Talk (quantity and content), Effort-based praise, Anxiety reduction strategies, and CHallenging play.

With respect to language skills, it is well established that children from higher SES families hear more words and more complex syntax than do their lower SES counterparts (Hart & Risley, 1995; Hoff, 2003; Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010; Walker, Greenwood, Hart, & Carta, 1994), and both experimental studies and interventions at home show that increasing children's exposure to language is effective at increasing children's vocabulary and language comprehension (see Mayer, Kalil, Gallegos, & Oreopoulos, 2015; Ramey & Ramey, 2004; Suskind et al., in press; York & Loeb, 2014). Similarly, for math skills, a variety of verbal and nonverbal aspects of caregiver-child interaction have been highlighted as predictors of children's developing numerical and spatial thinking. For instance, when controlling for overall parent language input, longitudinal associations have been identified between the number-talk that children hear at preschool-age and their understanding of cardinal number at kindergarten entry (Gunderson & Levine, 2011; Levine, Suriyakham, Rowe, Huttenlocher, & Gunderson, 2011) and between the spatial language children hear at preschool-age and their performance on nonverbal spatial tasks at 4.5 years old (Pruden, Levine, & Huttenlocher, 2011).

The informational content of those interactions is only part of the story. The way in which that information is communicated also matters. By first grade, children already report varying degrees of anxiety about math,

which is negatively related to their math achievement (Ramirez, Gunderson, Levine, & Beilock, 2013). Whereas math input from caregivers who are math-anxious can lead to low math achievement, increased math anxiety, and decreased persistence (Maloney, Ramirez, Gunderson, Levine, & Beilock, 2015), math input from caregivers who are not math-anxious can lead to high math achievement, decreased math anxiety, and increased persistence (Maloney & Beilock, 2012; Vukovic, Roberts, & Green Wright, 2013). Table S1 summarizes additional studies demonstrating the role of early caregiver input in children's cognitive development and academic attitudes.

Given the ample evidence for caregiver influence through a variety of channels, annual performance reporting requirements for Head Start should include documentation of the centers' impact on caregiver beliefs and practices. Distinct from measures of family volunteerism in Head Start centers, these measures should reflect centers' efforts to educate and support caregivers in executing a variety of specific TEACHing behaviors. Reporting requirements would focus programs on connecting with caregivers, raising the quality of such efforts, and would have the secondary benefit of facilitating further research in the area.

### Protecting Caregiver Motivation From Motivational Sinkholes

Programmatic efforts to increase caregiver awareness will only be useful if caregivers consistently carry out the relevant behaviors, but awareness of the problem and a general desire to fix it may not be sufficient (Sheeran, 2002). Environments that do not support three essential ingredients for long-term goal pursuit—self efficacy, planning, and feedback—can erode caregivers' motivation, causing “motivational sinkholes” to form beneath good intentions. If caregivers do not feel capable of improving their interactions, if they do not identify and plan for specific opportunities to execute supportive behaviors, and if they do not receive progress-clarifying feedback about their efforts, then they are unlikely to invest. Effective programming—supported by guidelines, resource allocation, and accountability at the policy level—can fill these sinkholes, ensuring that caregivers are operating in environments that optimally promote and sustain their motivation.

### *The efficacy sinkhole: Low efficacy limits goal setting*

People will not put forth effort unless their goals are accompanied by a sense of self-efficacy (Bandura, 1982; Locke & Latham, 1990). This is an important consideration for caregivers because “being a child's first teacher” might be intimidating, perhaps especially to those who may have had limited (or negative) experiences with formal schooling and

**Table 1.** Summary of Policy Challenges and Proposed “TEACH” Policy Responses in Head Start

| Problem                                                                                                                                                                                                   | Suggested response                                                                                                                                                                                                                    | Sample policy manifestation<br>(in Head Start context)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Scientific knowledge in action: The evidence base on effectiveness of specific interventions is still emerging.                                                                                        | Encourage existing programmatic efforts to focus explicitly on parents' opportunities to be “TEACHERs” (offering their children Talk and interaction, Effort-based praise, Anxiety-free learning interactions, and CHallenging play). | Annual performance reporting requirements should include documentation of impact on parenting beliefs, practices, and behaviors. Distinct from measures of caregiver volunteerism in Head Start centers, these measures should reflect centers' efforts to educate and support parents in executing TEACHing behaviors.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 2. Parent awareness: Parent–child interactions are critical in the early childhood years, but parents may not be aware of the many simple opportunities they have for educational interaction.            | Expose parents to best practices in parent-child interactions, emphasizing identifiable role-models.                                                                                                                                  | (a) Use waitlists in the many oversubscribed Head Start centers, as well as the Early Head Start pipeline, to reach more families with information about the wide variety of simple TEACHing behaviors.<br>(b) To expand reach beyond Head Start, support expanded efforts to deliver information through medical and other public support programs with which caregivers already interact.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 3. Motivational sinkholes: Parents want to do what is best for their children, but follow-through can be undermined by a lack of self-efficacy, failure to make specific plans, or insufficient feedback. | Support parents in developing their own simple, actionable, goal-directed steps toward effective interaction. Aim for regular implementation and habit formation.                                                                     | (a) Build efforts to model healthy, effective, culturally appropriate child–caregiver interactions into Head Start programs by facilitating caregiver observation of “model” lessons in the classroom. Remotely, short videos can allow observation of one's child interacting with teachers or showcase caregivers' peers interacting effectively with their own children.<br>(b) Supplement Head Start programming with text messaging-based curricula that provide caregivers with specific, tailored questions, strategies, and tips to increase and improve their interactions, specifically around math and literacy skill development. Emphasize communications that prompt caregivers to respond with, or at least record, specific plans and goals.<br>(c) Provide language pedometers, with accompanying dashboard technology, or app-based technology on smartphones or tablets to the most at-risk families in Head Start programs. Technology should monitor progress and facilitate feedback and conversation with center staff about progress in attaining caregivers' goals for interaction with their children. |

who have many competing demands—the circumstances that the most at-risk caregivers are facing. Given that many TEACHing channels involve simple behaviors, self-efficacy could be substantially boosted merely by spreading

accurate information about the many easy things caregivers can do. If caregivers falsely assume, for example, that “quality math input” implies advanced lessons or sophisticated toys, they may feel discouraged; but if they see that

behaviors as simple as counting everyday objects or playing with blocks can help advance their children's math skills (Levine, Ratliff, Cannon, & Huttenlocher, 2012), they should feel motivated to act on their intentions.

**Programming and policy implications.** Programs like Head Start can boost caregivers' self-efficacy for teaching by modeling effective interactions. When possible, this modeling should showcase caregivers' peers. Centers could host observation sessions, and short videos could be circulated to caregivers who cannot attend. To increase awareness and efficacy beyond the population of enrolled families, similar information could be circulated to waitlisted families at oversubscribed centers; to prospective enrollees who are in the Early Head Start pipeline; and through medical and other public support programs with which parents already interact, such as pediatrician visits covered by Medicaid or the Children's Health Insurance Program (see High et al., 2014, for the American Academy of Pediatrics' literacy-focused recommendations). Head Start can also act as a hub for collecting and sharing objective data about what caregivers are already doing (and could be doing) in different circumstances, thus bolstering the ability of other programs to support caregivers in setting challenging but reachable goals.

### ***The planning sinkhole: Missed opportunities for interaction***

General motivation should be scaffolded with specific plans, providing caregivers with a clear sense of how and when to work with their children. Plans that give caregivers ideas for educational opportunities and that follow an "if-then" structure will be most effective, reducing missed opportunities and potentially, over time, leading to habit formation (Gollwitzer & Oettingen, 2011; Wood & Neal, 2007; see also Rothman et al., 2015, this issue). The most effective programs will be those that go beyond the valuable first step of giving parents ideas for educational opportunities (e.g., "Try counting with your child!") to the more valuable second step of working with them to formulate specific structured plans tailored to their own opportunities and routines (e.g., "If we are having Cheerios for breakfast, then we will count the first 10!").

**Programming and policy implications.** Initiatives that afford extensive contact with caregivers, such as home visitation, can provide focused coaching on translating general desires into well-structured plans. For outreach in which personal contact is more limited, other communications can facilitate this kind of planning. For instance, when pediatricians or community centers distribute books, they could attach a form directly to the book that encourages writing down a specific reading plan. Given the increasing

availability of smartphones (even among low income families; Smith, 2015), text messages are an increasingly popular channel for distributing information and encouragement to parents (e.g., York & Loeb, 2014) and could enable two-way interaction. For instance, when parents receive tips about an activity that they would like to try, they could be encouraged to reply to that text message with a specific action plan that fits the activity into their schedule, which should strengthen their commitment to the plan (Cialdini & Trost, 1998). Pending cost-benefit analyses, text-message outreach might even be a more effective method of outreach than home visitation for serving certain populations.

### ***The feedback sinkhole: Lack of connection between efforts and outcomes***

Improving caregiver-child interaction is difficult because the link between today's behavior and next year's outcomes is not always clear, so slacking a little may not feel like a failure. Just as a single jelly donut will not ruin a balanced diet, swapping 15 minutes of puzzle play for 15 minutes of television will not, on its own, hold a child back. Because long-term outcomes are determined by the accumulation of isolated decisions and small steps, people may not recognize any given decision as consequential (Fishbach & Converse, 2011). The feedback sinkhole can be filled by giving parents well-structured, specific feedback that clarifies how well they are progressing toward the specific goals they set. Although it is impossible to show parents precisely how today's puzzle play will affect next year's test scores, it is feasible to demonstrate how today's puzzle play contributes to a weekly puzzle-time goal or how today's story time contributes to a monthly reading goal.

**Programming and policy implications.** The most precise progress monitoring can be accomplished (and the most comprehensive feedback provided) by distributing technology such as language pedometers (e.g., Suskind et al., 2015) or pre-loaded tablets (e.g., Berkowitz, Schaeffer, Beilock, & Levine, 2015; Mayer et al., 2015) that quantify language output or educational media usage. These tools are expensive, but they are arguably worthwhile for the most at-risk families and may eventually be more scalable as smartphone technology continues to improve. When such investments are infeasible or unnecessary, caregivers can still be coached—by Head Start center or other program staff—to keep track of their own progress the way one might count calories or log workouts. Notably, caregivers who are beginning a program will be most encouraged by feedback that emphasizes how much they have already accomplished, whereas caregivers whose commitment is more solid will be most encouraged by feedback that emphasizes where they

need to improve (Koo & Fishbach, 2008), and materials should be structured accordingly.

### ***Promise of the approach***

Three recent experimental interventions bundle the aforementioned motivational aspects wisely and provide support for the promise of targeted, efficient interventions. In one intervention with low-income caregivers, personalized coaching and technology-enabled monitoring improved the home language environment over a 6-week observation period (Suskind et al., 2015). Another intervention randomly assigned lower income families of preschoolers to participate in a year-long text messaging campaign and increased student literacy gains by .21 to .34 standard deviations (York & Loeb, 2014). The texts included facts to increase awareness; tips to increase efficacy through recommendations of specific, executable steps; and encouragement about the long-term growth promise of such activities. Finally, in an experiment with Head Start families in Chicago, a multipronged intervention using goal-setting, text-message reminders, and feedback successfully increased parent-child reading time (Mayer et al., 2015). Although these studies are preliminary, they point to the promise of intervening on caregivers' efficacy, planning, and access to feedback to promote both caregiver behaviors and children's achievement-related outcomes.

### **Conclusion: Efficient Delivery by Supplementing Existing Efforts**

Comprehensive interventions—which generally include extensive family outreach—can improve long-term outcomes for children born into lower SES families, but they are expensive and severely limited in how much of the population they can serve. The current recommendations do not involve new programs or infrastructure; they instead maximize the effectiveness of existing, large-scale policy efforts by increasing their focus on, and raising their standards of, caregiver support and outreach. Some programs do already incorporate elements of these recommendations, but the complementary focus on awareness, efficacy, planning, and feedback needs to be more widespread. Though rigorous field research assessing interventions on caregiver-child interaction is still in its infancy (see Kalil, 2014), many low-cost investments can be made now based on the findings of basic correlational and lab research, even as the more rigorous, randomized controlled trials research base continues to evolve. If implemented wisely, these efforts can simultaneously support the many families who face a variety of socioeconomic barriers and the development of further research efforts aimed at closing the achievement gap.

### **Acknowledgments**

E. A. Maloney and B. A. Converse contributed equally to this work. C. R. Gibbs is now at the Department of Economics, University of Notre Dame.

### **Declaration of Conflicting Interests**

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

### **Funding**

S. L. Beilock and S. C. Levine would like to acknowledge support from the U.S. Department of Education, IES Grant R305A110682 to Sian L. Beilock, and Susan C. Levine and the NSF Spatial Intelligence and Learning Center (SBE-0541957; SBE-1041707) to Susan C. Levine.

### **Supplemental Material**

Additional supporting information may be found at <http://pps.sagepub.com/content/by/supplemental-data>

### **Notes**

1. Though the federal role differs across these efforts, five major initiatives include Head Start; Early Head Start and the Early Head Start Child Care Partnerships; the Child Care and Development Fund; Preschool Development Grants; and the Maternal, Infant and Early Childhood Home Visiting program. Importantly, the governmental efforts occur alongside, and sometimes in conjunction with, specific interventions and programs such as Reach Out and Read, READY4K!, Thirty Million Words Initiative, and Vroom.
2. The Head Start program serves approximately 900,000 children with federal funding of over eight billion dollars annually (Gibbs, Ludwig, & Miller, 2013).

### **References**

- \*indicates a reference in Table S1 in the Supplemental Material
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, *37*, 122–147.
- Berkowitz, T., Schaeffer, M. W., Beilock, S. L., & Levine, S. C. (2015, March). *Bedtime learning together: Exploring the use of technology to support children's math learning and attitudes*. Poster presented at the biennial meeting of the Society for Research on Child Development in Philadelphia, PA.
- \*Cartmill, E. A., Armstrong, B. F., Gleitman, L. R., Goldin-Meadow, S., Medina, T. N., & Trueswell, J. C. (2013). Quality of early parent input predicts child vocabulary 3 years later. *Proceedings of the National Academy of Sciences, USA*, *110*, 11278–11283.
- Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity, and compliance. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4th ed., pp. 151–192). Boston, MA: McGraw-Hill.
- \*Demir, Ö. E., Rowe, M., Heller, G., Levine, S. C., & Goldin-Meadow, S. (2015). Vocabulary, syntax and narrative development in children with and without early unilateral brain

- injury: Early parental talk about the there-and-then matters. *Developmental Psychology*, *51*, 161–175.
- Duncan, G. J., & Magnuson, K. (2013). Investing in preschool programs. *The Journal of Economic Perspectives*, *27*(2), 109–131.
- Fishbach, A., & Converse, B. A. (2011). Identifying and counteracting temptations. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications, 2nd edition* (pp. 244–262). New York, NY: Guilford.
- Gibbs, C., Ludwig, J., & Miller, D. L. (2013). Head Start origins and impacts. In M. J. Bailey & S. Danziger (Eds.), *Legacies of the war on poverty* (pp. 39–65). New York, NY: Russell Sage Foundation Press.
- Goldhaber, D. (2002). The mystery of good teaching. *Education Next*, *2*(1), 50–55.
- Gollwitzer, P. M., & Oettingen, G. (2011). Planning promotes goal striving. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications, 2nd edition* (pp. 162–185). New York, NY: Guilford.
- Gunderson, E. A., & Levine, S. C. (2011). Some types of parent number talk count more than others: Relation between parents' input and children's number knowledge. *Developmental Science*, *14*, 1021–1032.
- Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Paul H. Brookes.
- High, P. C., Klass, P., Donoghue, E., Glassy, D., DelConte, B., Earls, M., . . . Williams, P. G. (2014). Literacy promotion: An essential component of primary care pediatric practice. *Pediatrics*, *134*, 404–409.
- Hoff, E. (2003). The specificity of environmental influence: Socioeconomic status affects early vocabulary development via maternal speech. *Child Development*, *74*, 1368–1378.
- Huttenlocher, J., Waterfall, H., Vasilyeva, M., Vevea, J., & Hedges, L. V. (2010). Sources of variability in children's language growth. *Cognitive Psychology*, *61*, 343–365.
- Kalil, A. (2014). Promoting early childhood development, Proposal 2: Addressing the parenting divide to promote early childhood development for disadvantaged children. In M. S. Kearney & B. H. Harris (Eds.), *Policies to address poverty in America* (pp. 29–36). Washington, DC: The Hamilton Project, Brookings Institution.
- Koo, M., & Fishbach, A. (2008). Dynamics of self-regulation: How (un)accomplished goal actions affect motivation. *Journal of Personality and Social Psychology*, *94*, 183–195.
- Levine, S. C., Ratliff, K., Cannon, J., & Huttenlocher, J. (2012). Early puzzle play: A predictor of preschoolers' spatial transformation skill. *Developmental Psychology*, *48*, 530–542.
- Levine, S. C., Suriyakham, L., Rowe, M., Huttenlocher, J., & Gunderson, E. A. (2011). What counts in the development of children's number knowledge? *Developmental Psychology*, *46*, 1309–1313.
- Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting & task performance*. Upper Saddle River, NJ: Prentice-Hall.
- Maloney, E. A., & Beilock, S. L. (2012). Math anxiety: Who has it, why it develops, and how to guard against it. *Trends in Cognitive Sciences*, *16*, 404–406.
- Maloney, E. A., Ramirez, G., Gunderson, E. A., Levine, S. C., & Beilock, S. L. (2015). Intergenerational effects of parents' math anxiety on children's math achievement and anxiety. *Psychological Science*, *26*, 1480–1488. doi:10.1177/0956797615592630.
- Mayer, S. E., Kalil, A., Oreopoulos, P., & Gallegos, S. (2015). *Using behavioral insights to increase parental engagement: The parents and children together (PACT) intervention* (NBER Working Paper 21602). Cambridge, MA: National Bureau of Economic Research. Retrieved from <http://www.nber.org/papers/w21602>.
- \*Petersen, L., & Levine, S. C. (2015). *The role of spontaneous block play on children's math knowledge*. Philadelphia, PA: Society for Research on Child Development.
- Pruden, S. M., Levine, S. C., & Huttenlocher, J. (2011). Children's spatial thinking: Does talk about the spatial world matter? *Developmental Science*, *14*, 1417–1430.
- \*Ramani, G. B., Rowe, M. L., Eason, S. H., & Leech, K. A. (2015). Math talk during informal learning activities in Head Start families. *Cognitive Development*, *35*, 15–33.
- Ramey, C. T., & Ramey, S. L. (2004). Early learning and school readiness: Can early intervention make a difference? *Merrill-Palmer Quarterly*, *50*, 471–491.
- Ramirez, G., Gunderson, E. A., Levine, S. C., & Beilock, S. L. (2013). Math anxiety, working memory, and math achievement in early elementary school. *Journal of Cognition and Development*, *14*, 187–202.
- Rothman, A. J., Gollwitzer, P. M., Grant, A. M., Neal, D. T., Sheeran, P., & Wood, W. (2015). Hale and hearty policies: How psychological science can create and maintain healthy habits. *Perspectives on Psychological Science*, *10*, 701–705.
- Sheeran, P. (2002). Intention—Behavior relations: A conceptual and empirical review. *European Review of Social Psychology*, *12*, 1–36.
- Smith, A. (2015). *U.S. Smartphone use in 2015*. Pew Research Center. Retrieved from [http://www.pewinternet.org/files/2015/03/PI\\_Smartphones\\_0401151.pdf](http://www.pewinternet.org/files/2015/03/PI_Smartphones_0401151.pdf)
- Suskind, D. L., Leffel, K. R., Graf, E., Hernandez, M. W., Gunderson, E. A., Sapolich, S. G., . . . Levine, S. C. (2015). A parent-directed language intervention for children of low socioeconomic status: A randomized controlled pilot study. *Journal of Child Language*. Advance online publication. doi:10.1017/S0305000915000033.
- U.S. Department of Education. (2008). *Schools and staffing survey, "Public School Questionnaire 2007-08."* Washington, DC: National Center for Education Statistics.
- Vukovic, R. K., Roberts, S. O., & Green Wright, L. (2013). From parental involvement to children's mathematical performance: The role of mathematics anxiety. *Early Education and Development*, *24*, 446–467.
- Waldfoegel, J., & Washbrook, E. (2011). Early years policy. *Child Development Research*, *2011*, 1–12.
- Walker, D., Greenwood, C., Hart, B., & Carta, J. (1994). Prediction of school outcomes based on early language production and socioeconomic factors. *Child Development*, *65*, 606–621.
- Wood, W., & Neal, D. T. (2007). A new look at habits and the habit-goal interface. *Psychological Review*, *114*, 843–863.
- York, B. N., & Loeb, S. (2014). *One step at a time: The effects of an early literacy text messaging program for parents of preschoolers* (NBER Working Paper No. 20659). Cambridge, MA: National Bureau of Economic Research.