

# Parent-Directed Approaches to Enrich the Early Language Environments of Children Living in Poverty

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## ABSTRACT

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Children's early language environments are critical for their cognitive development, school readiness, and ultimate educational attainment. Significant disparities exist in these environments, with profound and lasting impacts upon children's ultimate outcomes. Children from backgrounds of low socioeconomic status experience diminished language inputs and enter school at a disadvantage, with disparities persisting throughout their educational careers. Parents are positioned as powerful agents of change in their children's lives, however, and evidence indicates that parent-directed intervention is effective in improving child outcomes. This article explores the efficacy of parent-directed interventions and their potential applicability to the wider educational achievement gap seen in typically developing populations of low socioeconomic status and then describes efforts to develop such interventions with the Thirty Million Words Project and Project ASPIRE (Achieving Superior Parental Involvement for Rehabilitative Excellence) curricula.

**KEYWORDS:** Low socioeconomic status, disparities, early language, intervention, parent implemented

**Learning Outcomes:** As a result of this activity, the reader will be able to (1) enumerate advantages parents possess as implementers of intervention for young children, (2) discuss the importance of developing interventions specifically for populations of low socioeconomic status and nonmainstream populations.

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Early language environments are foundational for children's language and cognitive development, profoundly impacting school preparedness and ultimate outcomes. Significant disparities exist in children's early language environments, both in the quantity and quality of language they hear from their parents.<sup>1</sup> Though disparities are noted elsewhere, perhaps the most profound fall along socioeconomic lines, serving as a precursor to the staggering achievement gap seen throughout the academic careers of children from low socioeconomic status (SES). Parent-directed intervention can be useful in enhancing the early language environments of young children, particularly those from backgrounds of low SES. This article will discuss the strengths of parent-directed interventions for enhancing children's early language environments and the importance of interventions specifically for families from backgrounds of low SES and other nonmainstream backgrounds. We will then explore our efforts for developing such interventions with the Thirty Million Words Program and Project ASPIRE (Achieving Superior Parental Involvement for Rehabilitative Excellence).

### IMPORTANCE OF EARLY LANGUAGE ENVIRONMENTS

Children's early language environments profoundly impact their ultimate life-course trajectories, affecting not only their linguistic development but also their educational attainment and cognitive outcomes.<sup>1-7</sup> Hart and Risley's foundational study demonstrated a significant correlation between the number of words a child hears and his or her IQ and later educational attainment.<sup>1</sup> Yet it is not merely the quantity of words that matters: a substantial body of research indicates that the qualitative aspects of parent language also significantly affect child development and outcomes, including complexity of speech, responsive caregiving, and adult-child interaction.<sup>8-14</sup> This research clearly shows that a qualitatively and quantitatively rich early language environment is critical for a child to reach not only his or her linguistic potential but ultimate life-course potential as well.

### DISPARITIES IN EARLY LANGUAGE ENVIRONMENTS

Significant disparities exist in children's early language environments, with equally significant lifelong consequences. An early language environment lacking rich and abundant language input, lexical complexity, joint attention, and reciprocity contributes to diminished child language outcomes, which includes smaller vocabularies and weaker narrative and preliteracy skills.<sup>1,9,15-17</sup> This disparity in language input occurs in children with speech and language delay, children with intellectual or developmental disabilities such as autism spectrum disorder, children with hearing loss, and, most robustly, children born into poverty.<sup>9,17-23</sup>

In their landmark work, Hart and Risley<sup>1</sup> demonstrated a significant inequity in parent language input: by age 3, children from families of low SES heard over 30 million fewer words than children from families who were of high SES. And the difference was not purely quantitative: the children from families of low SES heard fewer unique words and more prohibitions than the children from homes of high SES. As a result, significant vocabulary disparities emerged between the children from homes of low and high SES by 16 months of age. These disparities widened substantially until at preschool entry the children of low SES from language-deprived homes presented with half the vocabularies of their peers of high SES.<sup>1</sup> The inequities noted persisted, with the children from austere early language environments having smaller vocabularies and weaker reading skills in the third grade.<sup>1</sup> Huttenlocher et al described a parallel SES gap in the diversity of words spoken and syntactical structures produced by parents and their children, with reduced lexical diversity among parents of low SES and corresponding reduced vocabularies in their children.<sup>15</sup>

This gap in linguistic input mirrors an academic achievement gap that is evident the first day of school and persists throughout the educational careers of children from low and into adulthood.<sup>4</sup> Fewer than half of children of low SES in the United States enter kindergarten at grade level, compared with 75% of children from homes of middle and high SES.<sup>24</sup> The deficit does not improve with

time: at least 79% of black and Latino public school students, who are disproportionately impoverished, perform below grade level in math and reading in 4th, 8th, and 12th grades, compared with 60% of public school students overall.<sup>25</sup> High school and college graduation rates for black and Latino students remain substantially lower than those of their white peers, with profound potential economic ramifications for individuals with diminished educational attainment.<sup>25</sup>

### PARENT-DIRECTED PROGRAMS

Parent linguistic input lies at the heart of the problem; yet it also lies at the heart of the answer. Studies have demonstrated that the relationship between parent SES and child-directed speech is mediated by maternal knowledge of child development;<sup>21</sup> therefore it stands to reason that addressing parent knowledge through intervention can impact parent language input and potentially impact children's school preparedness and eventual school outcomes. Given the critical effect parents have on children's early language environments, parents are well poised as the prime agents of delivering language support and enhancement.<sup>26</sup> Much can be gleaned from the traditional parent-directed interventional approaches used in speech and language therapy. Parents have frequent and extensive contact with their children; can implement therapies more often, for longer periods of time, and in the natural home setting; and are motivated to help their children. These traits, often coveted in a clinical therapy setting, benefit a parent-directed, home therapy approach to intervention and remove the challenges of generalization of skills from clinical to home environment settings.<sup>26</sup> It is for this reason that parent-directed approaches are at the core of many interventions for speech and language delays and for the federal early intervention program for young children with disabilities.<sup>27</sup>

There is a robust literature documenting the positive effects of parent interventions for children with speech and language delays,<sup>23,28-32</sup> which gives promise and insight for improving the language environment of typically developing children in households of

low SES. In a meta-analysis of 18 studies of parent-implemented language interventions, Roberts and Kaiser found parent-implemented language interventions to have positive, significant effects on children's expressive and receptive vocabulary and language skills, rate of communication, and expressive morphosyntax.<sup>23</sup> Though intervention approaches and populations assessed varied, Roberts and Kaiser found parents to successfully implement language interventions with their children with relatively modest training, positively affecting children's language outcomes.<sup>23</sup> Most intervention approaches assessed by Roberts and Kaiser focused on broad social communication, striving to address the type and amount of parent input by incorporating linguistic strategies for integration in daily routines. Parents receiving intervention were found to be more responsive and to use more language models, both of which are positive parent-child interaction styles facilitative for child language development.<sup>23</sup>

Perhaps the most well-known parent-directed intervention for children with language delays/disorders is the Hanen Centre's *It Takes Two to Talk*. The *It Takes Two to Talk* intervention is administered through trained speech-language pathologists to parents so that skills learned by parents can be implemented with children in the natural home environment.<sup>33</sup> The naturalistic intervention approach emphasizes joint attention, conversational turn elicitation and facilitation, modeling, and expansion as critical skills to incorporate in daily behaviors.<sup>33</sup> Assessments have found the intervention to increase maternal responsiveness, decrease maternal directiveness, increase children's turn-taking ability, and make maternal-child interactions longer, more balanced, and more frequent.<sup>33,34</sup> Maternal gains maintained over a 4-month postintervention follow-up in one assessment.<sup>34</sup>

Though the interventions mentioned above were developed for children with diagnosed speech and language delays, their broader applicability to addressing the educational achievement gap must be considered. With so much of the educational attainment disparity stemming from early language environments, the basic tenants of language input and interactional enhancement found in early

interventions stand to offer great benefit to typically developing children as well.

### **IMPORTANCE OF DEVELOPING INTERVENTIONS FOR POPULATIONS OF LOW SES AND NONMAINSTREAM POPULATIONS**

The strength of the Hanen Centre's intervention and the evidence in Roberts and Kaiser's analysis lend strong support to parent-implemented interventions as successful tools not only in improving outcomes for children with speech and language delays, but also potentially to improve school readiness in typically developing children. However, a significant limitation that cannot be overlooked is that the majority of parent-directed interventions tend to attract and be implemented with predominantly middle SES parents,<sup>26</sup> thus greatly limiting generalizability of the results of its assessments to populations of low SES and diverse populations. Little research exists on the applicability of Hanen's *It Takes Two to Talk* to culturally diverse demographics despite its wide use with Euro-American populations.<sup>35</sup> This lack of evidence for intervention generalizability with populations of low SES and culturally diverse populations is rather common: only two of the 18 studies assessed by Roberts and Kaiser included participants of lower SES in study samples.<sup>23</sup> This limited sampling leaves it unclear whether the success seen with parent-implemented interventions would be more widely applicable to families of other social and cultural contexts, particularly families of lower SES and from diverse cultural backgrounds.<sup>23</sup>

The critical importance of developing and assessing interventions for these underserved families of low SES cannot be overstated. Low SES and its incumbent elements of low education, income, and less prestigious occupational status often intersect with social factors such as segregation, weaker school systems, and less safe and underresourced neighborhoods, with less access to quality health and educational services.<sup>36,37</sup> Thus it is not surprising that children of low SES are at greater risk for speech and language delays and diminished school readiness, performance, and ultimate

outcomes.<sup>37,38</sup> A lack of interventions specifically developed for and tailored to the needs of populations of low SES and typically under-resourced populations only further compounds the challenges already faced by children growing up in poverty.

Inroads have been made to include under-represented populations in parent-directed interventions. Recognizing the lack of research regarding culturally sensitive intervention development, Kummerer implemented Hanen's Spanish-translated *You Make the Difference* curriculum (*Usted Hace la Diferencia*) with 14 Mexican American immigrant families and assessed parents' perceptions of communication delays and usefulness of the intervention.<sup>35,39</sup> During intervention, Kummerer noted participants responding positively to modeling of facilitative language behaviors and adopting novel linguistic strategies, as well as self-reporting favorable impressions of the Hanen curriculum.<sup>35</sup> Given the profound challenges that populations of low SES and underrepresented populations face and the significant impact of culture, language, and linguistic differences upon intervention uptake and acceptability, it is important that interventions both be developed specifically for underserved populations and be assessed with scientific rigor.

### **THE THIRTY MILLION WORDS PROJECT AND PROJECT ASPIRE**

Building on the existing clinical and research literature, we have developed two novel parent-focused programs for children of low SES: Project ASPIRE ([project-aspire.org](http://project-aspire.org)) and the Thirty Million Words Project ([tmw.org](http://tmw.org)) at the University of Chicago. Both programs strive to enrich the early home language environments of children in families of low SES. Project ASPIRE and the Thirty Million Words Project are parent-directed, home-based interventions delivered by trained coaches. Although both curricula have been developed for families of low SES, Project ASPIRE is a listening and spoken language curriculum for children with hearing loss, whereas Thirty Million Words has been developed to improve school readiness in typically developing children.

The guiding philosophy of both programs is that parents are the key agents of change in their children's lives. As such, the curricula have been developed to support parents' learning styles, literacy and education levels, and daily routines, with high value placed on cultural competency. One potential limitation of parent-implemented intervention noted by Tannock and Girolametto is that the methodology assumes at least one parent has ample time to administer therapy activities with the child, which may be prohibitive to single-parent households, large families, or families of low SES, which are more likely to have other strains on parent time and availability.<sup>26</sup> To avoid limited uptake of therapeutic or beneficial activities, great emphasis is placed on matching language-enhancing strategies with daily routine activities so as to encourage generalization and adoption of positive linguistic practices.

These interventions are delivered through one-on-one home visits, utilizing computer-based, standardized modules that synthesize cross disciplinary research and best practices from the language and child development, health promotion, behavioral intervention research, and social marketing fields.<sup>40-42</sup> Behavior change techniques are embedded throughout the modules, which incorporate video modeling, constructive goal setting, and a novel technique we call "quantitative linguistic feedback" into each session to reinforce parent efforts and progress. Importantly, the Project ASPIRE and Thirty Million Words curricula do not promote changing cultural practices or idiomatic speech; rather, the curricula encourage practices that are scientifically demonstrated to positively impact development and school readiness in all children (e.g., responsive parenting, conversational turns, decontextualized language). Through knowledge, skill building, and supportive behavior change techniques, the curricula support parents' growing sense of agency in fostering their children's development, through the lens of their own linguistic style and unique parent-child relationship.

Sustained parental behavior change is at the heart of positively impacted child outcomes. To this end, behavioral interventions must incorporate evidence-based behavior

change theories.<sup>43,44</sup> Three behavior change theories form the bedrock of the Thirty Million Words and Project ASPIRE curricula: the Health Belief Model,<sup>45</sup> Bandura's social cognitive theory,<sup>46</sup> and the Theory of Planned Behavior.<sup>47</sup> Incorporated throughout the programs' curricula are opportunities for parents to set, monitor, and respond to goals (Theory of Planned Behavior<sup>47</sup>) and to engage external prompts for behavior change (Health Belief Model<sup>45</sup>). Guided by these theories, the Thirty Million Words and Project ASPIRE interventional approach rests on three main philosophies: (1) increasing parent knowledge of child language development and the impact of parent linguistic input upon such development is critical to parent behavior change; (2) fostering parents' belief that children's language and cognitive development are malleable and impacted by parent input promotes parents' agency in facilitating their child's development; (3) providing objective, frequent feedback on parents' linguistic input can motivate and reinforce behavior change.

### **Knowledge of Child Language Development**

Studies indicate that the relation between parent use of child-directed speech and parent SES are mediated by knowledge of child development.<sup>21</sup> Thus we hypothesized that increasing parent knowledge of child development through intervention could positively impact parent linguistic input, and that demonstrating to parents how their language input affects their child's cognitive, behavioral, and educational outcomes would be essential in impacting parent behavior.<sup>44,48</sup> Woven throughout the Thirty Million Words and Project ASPIRE curricula are discussions of early child brain development ("Just by talking, you build and strengthen connections in your child's brain.") and the impacts of environment and parent language input upon development, school readiness, and school outcomes ("Just by talking, you get your child ready for school and help him reach his full potential."), along with strategies for supporting and facilitating this development.

### **Belief in the Malleability of Intelligence**

Increasing knowledge of child development and building skills to support that development are important for improving child language environments, yet are insufficient if parents do not believe that their child's intelligence and cognition are malleable and able to be enhanced through input.<sup>18,49,50</sup> Dweck finds that individuals tend toward one of two opposing theories of intelligence: an "entity" theory, that intelligence is an inherited, fixed, and unchangeable trait, or an "incremental" theory, that intelligence is malleable and therefore can be increased with effort.<sup>51</sup> The importance of promoting incremental theories of intelligence is twofold: believing that intelligence and cognitive traits are malleable is an essential precursor to actions that promote such traits, and promotion of incremental theories in children have been demonstrated to lead to positive educational outcomes. Gunderson et al have demonstrated that parent praise of children's efforts rather than fixed traits at age 1 to 3 years predicts a malleable theory of intelligence at age 7 to 8 years, including a greater preference for challenging tasks and attributing success and failure to effort rather than inborn traits.<sup>52</sup> Interventions promoting incremental theories of intelligence have demonstrated increased motivation, resilience, and academic achievement in middle school and college students.<sup>18,49,50,53</sup> To this end, we promote incremental theories of intelligence by teaching parents that "your talk is what grows your baby's brain" and "children aren't born smart; they're made smart," to help parents develop a sense of agency as the key in their children's development and ultimate outcomes.

### **Frequent Feedback on Performance**

With qualitative and quantitative enhancements of parent linguistic input as the primary target of the Thirty Million Words and Project ASPIRE interventions, frequent and objective feedback on parent behavior is critical. Adult behavior change is complex, and the behavior change literature emphasizes the importance of theoretically based, well-defined strategies for effective intervention.<sup>42,54-56</sup> The interventions have adapted two strategies from the research

literature to promote and sustain parent behavior change: video modeling and quantitative linguistic feedback.<sup>57,58</sup>

### **Video Modeling**

Building upon the well-established behavior change strategy of video modeling that involves videotaping a parent practicing a new behavior and reviewing the video with an interventionist to gain further insight,<sup>14,58</sup> the Thirty Million Words and Project ASPIRE curricula view video modeling as an essential technique for skill building and enhancing mindfulness in parents. Each session, the parent and coach videotape themselves performing language-enhancing strategies with the child and then review the video together to discuss successes and challenges in adopting the given strategy. Parents and coaches discuss the video modeling collaboratively, highlighting "high talk" times and strategizing ways to enhance parent-child interaction at other times. Coaches are trained to provide feedback to parents through the lens of teaching tools embedded throughout the curricula by identifying positive parent behaviors and connecting them to child outcomes ("I can see you tuning in to what your child is paying attention to; that means all your words are building his brain."), to provide objective and constructive, rather than evaluative, feedback.

### **Quantitative Linguistic Feedback**


As a means to make concrete the rather nebulous concept of increasing one's own talk, the Thirty Million Words and Project ASPIRE curricula incorporate regular quantitative linguistic feedback. Through the use of the Language ENvironment Analysis (LENA) technology that works as a "linguistic pedometer," coaches provide parents with weekly quantitative linguistic feedback, which allows parents to see what their children hear over the course of a day through graphical reports of parents' actual linguistic input and engagement with their children.<sup>59,60</sup> The LENA is a wearable digital recording device that records for 16 continuous hours, quantifying adult and child word counts, conversational turn counts, and

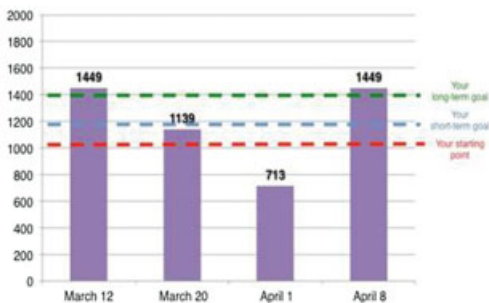
quality of audio environment, including television exposure,<sup>61</sup> and grants an unprecedented window into the home language environment. Parents receive printed graphs reporting their recording results (see Fig. 1), which serve as “biofeedback” to allow them to monitor progress and support behavior change, making concrete and quantifiable their efforts. Each session, coaches and parents review prior feedback reports and set goals for the next recording. This regular goal setting and feedback has been found to be effective in causing behavior change in adults and is a foundational strategy to the Thirty Million Words and Project ASPIRE curricula.<sup>49,50,57,62</sup>


The initial concept of quantitative linguistic feedback and the core concepts of the Project ASPIRE and Thirty Million Words curricula were assessed in small proof-of-concept feasibility studies that demonstrated significant increase in adult words spoken and conversational turns elicited during intervention, as measured by the LENA system.<sup>59,60</sup> Building upon this promising foundation, the Thirty Million Words and Project ASPIRE curricula were expanded and formatively tested in one-on-one cognitive interviews and group sessions to assess acceptability and feasibility among the target demographic before testing for efficacy on a broader scale. The Project ASPIRE curriculum is currently undergoing assessment in a quasi-experimental study with early intervention providers, whereas the full Thirty Million Words curriculum was tested in a randomized controlled trial on the south side of Chicago.

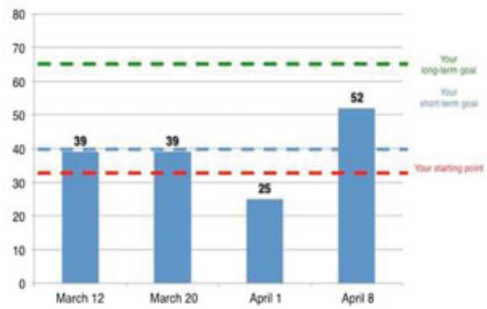
**Iterative Development of Thirty Million Words and Project ASPIRE**

The formation of truly evidence-based curricula requires systematic development and assess-

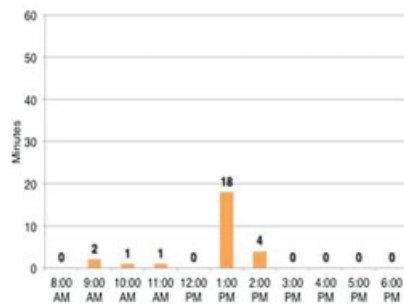
 **Average words per hour**



 **Average turns per hour**



 **TV and Media hour by hour**



**Figure 1** Quantitative linguistic feedback report example.

The results of the randomized controlled trial gave promising evidence of the efficacy of the Thirty Million Words intervention.<sup>63</sup> The Thirty Million Words intervention was found to significantly increase parent knowledge of child language development and, particularly, their own role in that development. We believe this increase in knowledge and understanding is integral to parents' behavior change and ultimate intervention success. Parent linguistic input and interaction was positively impacted, evidenced with increased adult word counts, conversational turn counts, and increased diversity of parent vocabulary, measured by word types. The most prominent change noted in parent behavior was the significant increase in conversational interaction with their children. We consider this to be a clear measure of language environment enhancement as it is indicative of actual parent-child interaction.

Notably, parent linguistic behaviors dropped after intervention, though still remaining above initial baseline levels. For true language environment enhancement, behavior change must be sustained beyond the intervention period; thus, supports must be put in place to help parents maintain gains made during intervention. To this end, the Thirty Million Words curriculum has been modified and expanded and postintervention booster sessions are being incorporated to provide continued support beyond the intensive intervention sessions. A longitudinal study to test the expanded Thirty Million Words curriculum is currently being planned to better understand intervention effects on both parent behavior and long-term child outcomes.

The Thirty Million Words and Project ASPIRE interventions have demonstrated promise in effecting behavior change through one-on-one transmission. But to have impact on a broader level, we must think at a population level. By using what these two successful projects have taught us about effectively changing language environments, we must work toward developing an economically feasible, successfully disseminated nation-level program. An important aspect of scaling and disseminating the broader messages of the curricula will be harnessing the power of social capital. Participants in both programs frequently reported sharing information and strategies from the

curricula with family, friends, and even strangers in the community. Fostering this desire to share and investigating ways to further harness parents' social capital and established social and relational networks has the potential to both magnify and support behavior change,<sup>64</sup> as well as more broadly disseminate the messaging.

## CONCLUSION

With 16 million children living at or below the federal poverty line in the United States and another 16 million living in relative poverty (CDF 2011<sup>25</sup>), the urgency to address the staggering achievement gap faced by children of low SES cannot be overstated. The contributing factors to this gap are multifactorial and complex; yet the influence of children's early language environments is profound and undeniable. Involvement of parents is critical in improving children's early language environments and ultimately addressing this gap so that all children may reach their full potentials. Both the Thirty Million Words Project and Project ASPIRE have demonstrated promise in effecting behavior change through one-on-one transmission. The curricula have shown that parents can become active participants in changing their children's language environments when they are given the proper tools, encouragement, and an understanding of their own importance in their children's development. However, to have impact on a broader level, we must develop and refine a scalable approach that may easily and economically be expanded to a population level so that all parents have the support to help their children reach their full potentials.

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