The Power of Language Nutrition for Children's Brain Development, Health, and Future Academic Achievement CE

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ABSTRACT

Language Nutrition, a term created to describe language exposure that is rich in quality and quantity and delivered in the context of social interactions, is crucial for a child's development and is strongly associated with his/her future literacy, academic achievement, and health. However, significant differences in children's early language environments contribute to disparities in their educational and health trajectories. Interventions, including book distribution programs, coaching parents to enrich their child's language environment, and public awareness campaigns, have all been shown to positively influence a child's access to language-rich interactions. Incorporating Language Nutrition coaching and literacy promotion into pediatrics is a promising platform for building the capacity of parents to provide language exposure to their children. By teaching parents both how and why to treat their child as a conversational partner and by modeling such interactions, pediatric health care providers can help parents set their children on a pathway toward literacy, educational success, and health. J Pediatr Health Care. (2017) *31*, 493-503.

KEY WORDS

Child development, Language Nutrition, language-rich interactions, literacy promotion

OBJECTIVES

1. Describe the role of pediatric providers in literacy and promotion of Language Nutrition.
2. Understand the influence of Language Nutrition on a childs future education and health outcomes.
3. Develop skills to teach parents why and how to engage in language-rich interactions and to provide Language Nutrition to their children.

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Early childhood is a critical period for developing language skills, including learning to understand and speak language (Shonkoff & Phillips, 2000). Language enables a child to communicate and interact with others, which encourages both social and cognitive development and is a prerequisite of school readiness and literacy (Dickinson & Porche, 2011; Forget-Dubois et al., 2009; Hart & Risley, 1995; Rowe, Raudenbush, & Goldin-Meadow, 2012; Weisleder & Fernald, 2013). Neural networks for language acquisition are fully formed before birth; babies are able to perceive and react to sound as early as at 24 weeks gestation and begin to learn language in utero by 35 weeks gestation, suggesting that newborn infants' brains are primed to learn language (Kisilevsky et al., 2009; Perani et al., 2011). In fact, growth in synapses responsible for language learning peaks at 6 months of age (Shonkoff & Phillips, 2000). This synaptic growth is influenced by auditory stimuli in the child's early language environment (Hoff & Naigles, 2002; Shonkoff & Phillips, 2000). Given this robust neuroplasticity, early childhood is a time of both significant vulnerability and immense opportunity for establishing the foundational neural circuitry necessary for higher learning (Shonkoff & Phillips, 2000).

LANGUAGE NUTRITION

Early exposure to language-rich interactions between adults and children forms the basis of Language Nutrition, a term created to describe the use of language sufficiently rich in engagement, quality, quantity, and context that it nourishes the child neurologically, socially, and linguistically (Head Zauche, Thul, Darcy Mahoney, & Stapel-Wax, 2016; Weldon, 2014). Just as a child needs an adequate amount of nutritious food for physical growth, so too does a child need language for his or her brain development (Weldon, 2014). Evidence indicates that both the quantity and quality of words spoken to a child in the first 3 years of life predict a child's language and emerging literacy skills more strongly than socioeconomic status, parent level of education, and race/ethnicity (Dickinson & Porche, 2011; Hart & Risley, 1995; Hoff, 2003, 2013; Hurtado, Marchman, & Fernald, 2008; Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010; Rowe, 2012; Weisleder & Fernald, 2013). A higher number of words spoken to a child contributes to increased vocabulary development, enhanced language and speech processing, and improved literacy outcomes (Hoff & Naigles, 2002; Hurtado et al., 2008; Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991; Weisleder & Fernald, 2013; Zimmerman et al., 2009). Remarkably, the quantity of words spoken to a child has been shown to mediate the relationship between social risk factors, such as low socioeconomic status and low levels of parent education, and language outcomes (Burchinal, Vernon-Feagans, & Cox, 2008).

Greater reciprocity in speech, or conversational turns, also promotes language outcomes and may even be more influential than the quantity of words (Ambrose, VanDam, & Moeller, 2014; Kuhl, 2007; Zimmerman et al., 2009). A *conversational turn* is defined as back-and-forth communication, or adult speech followed by a child's vocalization within 5 seconds or vice versa. Conversational turns invite children into the conversation regardless of whether they are able to communicate verbally or through nonverbal signals and provide children with the opportunity to build their communication skills in the context of an engaged social relationship (Kuhl, 2007; Zimmerman et al., 2009). The importance of social engagement through conversational turns is highlighted by studies showing that media exposure and overheard speech not directed toward the child offer no support for a child's early lexical development (Ambrose et al., 2014; Christakis et al., 2009; Mendelsohn et al., 2010; Weisleder & Fernald, 2013). This research suggests that the words a child hears need to be directed at the child for them to have developmental benefits. As a result, language-rich interactions with an engaged caregiver provide children with an environment that is conducive to language learning.

There are a number of programs across the United States that have begun to incorporate Language Nutrition as a concept into pediatric health care. Language Nutrition coaching can be executed in different programs, by different pediatric providers, and in a variety of settings with the same goal of improving rich parent/adult–child interaction.

THIRTY MILLION–WORD GAP

Variations in the language environments of young children have been well documented (Greenwood, Thiemann-Bourque, Walker, Buzhardt, & Gilkerson, 2011; Hart & Risley, 1995; Hoff, 2003). Socioeconomic status has been shown to be a key determinant of the language input parents provide for their children (Hart & Risley, 1995; Hoff, 2003, 2013; Rowe, 2008). Although all families communicate with their children, children who live in low-income families generally are more likely to hear shorter sentences and phrases and are less likely to hear words of encouragement and prompts that encourage the child's participation in the conversation (Fernald, Marchman, & Weisleder, 2013; Hart & Risley, 1995; Hoff, 2003). In addition to the quality of the language input, the quantity of words spoken to a child has substantial differences across socioeconomic groups (Fernald et al., 2013; Hart & Risley, 1995; Hoff, 2003). In a renowned study by Hart and Risley, children growing up in low-income families were found to hear 600 words per hour, whereas children growing up in middle- to high-income families heard 2,000 words per hour (Hart & Risley, 1995). Over the course of the first 3 years of life, this accumulates into a thirty million–word gap

between children of low socioeconomic status and those of higher socioeconomic status (Hart & Risley, 1995). Inequalities in language and cognitive development by socioeconomic status are present as early as 9 months old, and gaps in vocabulary skills rapidly widen throughout early childhood (Fernald et al., 2013; Halle et al., 2009). As a result, low-income children arrive in kindergarten with exposure to only about one third of the words heard by their more affluent peers. This disparity in language exposure contributes to gaps in vocabulary, school readiness, and long-term academic achievement. It is important to note, however, that socioeconomic status does not by itself create these disparities, but rather differences in average language exposure between socioeconomic groups.

THIRD GRADE LITERACY

The word gap and disparities in early vocabulary have significant implications for a child's future literacy and educational trajectory. A child's vocabulary at the age of 3 years has been found to be the single strongest predictor of a child's ability to read proficiently by third grade (Dickinson & Porche, 2011; Hart & Risley, 1995; The Campaign for Grade Level Reading, 2014). Third grade marks a time when children are expected to shift from "learning to read" to "reading to learn" (Fiester & Smith, 2010; The Campaign for Grade Level Reading, 2014). Eighty-five percent or more of the fourth grade curriculum in the United States is delivered through textbooks, smart boards, computers, and worksheets (Fielding, Kerr, & Rossier, 2007). As concepts in all subject areas start to increase in complexity, their verbal descriptions become more complex and are not comprehensible to children who are not able to read proficiently (Fielding et al., 2007; Fiester & Smith, 2010). As a result, children who are not able to read on grade level by the end of third grade fall further behind in school (U.S. Department of Education, 1999; Fiester & Smith, 2010; The Campaign for Grade Level Reading, 2014). In 2015, 64% of fourth graders in the United States did not meet the standards for proficient grade-level reading (National Center for Education Statistics, 2015). This low literacy rate has enormous educational, health, and economic implications, not only for the individual children but also for the nation (Fiester & Smith, 2010; National Center for Health Statistics, 2012; Robert Wood Johnson Foundation, 2009; Sum, Khatiwada, McLaughlin, & Palma, 2009).

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This progressing gap in academic achievement between children who can read and children who cannot read at grade level by the end of third grade is highlighted through a disparity in educational attainment for these children. Children who meet the standards for third grade literacy are 4 times more likely to reach high school graduation than those who are not as literate (Fernandez, 2012; Fiester & Smith, 2010; The Campaign for Grade Level Reading, 2014).

RELATIONSHIP BETWEEN EDUCATION AND HEALTH

Better education leads to healthier lives. Research points to significant associations between educational attainment and individual health outcomes (Fiester & Smith, 2010; National Center for Health Statistics, 2012). High school graduates have a higher life expectancy and are less likely to engage in risky behaviors, have a chronic disease, receive welfare assistance, or be unemployed, victims of violence, perpetrators of crimes, or incarcerated (Fiester & Smith, 2010; Robert Wood Johnson Foundation, 2009; National Center for Health Statistics, 2012; Sum et al., 2009). They also are more likely to engage in health-promoting activities such as exercise, follow screening guidelines, and be compliant with medication use (Fiester & Smith, 2010; Robert Wood Johnson Foundation, 2009; National Center for Health Statistics, 2012; Sum et al., 2009). Promoting literacy has been identified not only as an education priority but also a public health imperative by government and public health officials at both the national and state levels (Johnson & Shelton, 2014; Kanne, 2014; Office of the Governor, 2015; U.S. Department of Education, 1999).

PURPOSE

The importance of talking to babies, reading to young children, and using everyday words as opportunities to enhance early language learning has been gaining national prominence. Although all families communicate and interact with their babies, there is substantial variation in children's early language environments. Parent knowledge of child development and the importance of language exposure greatly affects the quality of a child's language environment and opportunities for learning (Rowe, 2008). Parents of infants and young children are uniquely poised

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to be their child's first and best teachers given the time they spend with their child and the influence of parenting on a child's health and development. Therefore, parents are key targets for education and skill building around language.

The purpose of this article is to review key components of language-rich interactions and examine existing or previously developed interventions that focus on improving the language and literacy skills of 0- to 3-year-old children. This two-fold purpose will lead to a discussion of how pediatric health care providers can integrate Language Nutrition coaching into their daily practice to help support families in optimizing their child's future health and educational trajectory.

REVIEW OF THE LITERATURE

PubMed and Web of Science were searched for peer-reviewed studies published between 1990 and 2015 in the English language using the key terms *parent or caregiver, infant or child, intervention, talk or read,* and *language or literacy*. Studies were selected if they discussed or evaluated parent-based interventions for improving the language or literacy of 0- to 3-year-children. A total of 57 articles met search criteria.

THE BASIS OF LANGUAGE NUTRITION

Quantity of Words

Many studies have documented the effects of the quantity of child-directed speech on a child's cognitive, language, and academic outcomes (Head Zauche et al., 2016; Hurtado, Marchman, & Fernald, 2008; Rowe, 2008, 2012; Weisleder & Fernald, 2013; Zimmerman et al., 2009). Research has shown that the quantity of speech directed at children even as young as 32 weeks' corrected gestational age has resulted in neurocognitive benefits (Caskey, Stephens, Tucker, & Vohr, 2014). Greater quantity of speech directed at a young child may result in improved language and academic outcomes by providing children with more opportunities to interpret language and be exposed to a greater variety of grammatical combinations and diversity of words and may help children develop skills necessary to learn language, such as word segmentation and language processing.

Words can be delivered in a variety of different ways in multiple different contexts. Parents and caregivers can narrate their daily activities, point out various objects in their environment, ask their baby questions about how he/she is feeling, and share books, nursery rhymes, and songs. All of these activities are ways in which parents or caregivers increase the quantity of words in their child's early language environment and thus enrich their learning potential (Glascoe & Leew, 2010; Rodriguez et al., 2009; Topping, Dekhinet, & Zeedyk, 2013).

Power of Interactions

Social relationships drive the need for an understanding of language and is an essential component of language learning. Language is the basis by which individuals are able to communicate with others and thus, language learning does not occur passively. Extensive research has shown the profound influence of social engagement for an infant's language development, and theories of social learning have emphasized the importance of social interaction for language learning (Brofenbrenner, 2005; Kuhl, 2007; Tomasello, 2003; Vygotsky, 1978). Children who establish greater joint attention and follow the gaze of an adult develop a larger and more complex vocabulary in the first year of life than children who do not track eye movements (Brooks & Meltzoff, 2008). It is possible that contingent and reciprocal social behaviors, such as establishing joint attention, provides additional information to infants that help to scaffold their language development, including the provision of additional cues for communication intentions. Additionally, social interactions may help facilitate language learning through increased attention to the language being delivered; infant attention has been shown to be greater with a live person than a person via television or recordings (Kuhl, Tsao, & Liu, 2003).

There are no scientific data to suggest that television, educational videos, or music recordings have the same positive, measurable impact on early childhood brain development as language from an interaction between an adult and child (Weisleder & Fernald, 2013). Infants have been found to learn language from adults in the context of an engaged adult–child interaction but not when the same information was delivered via a television (Conboy, Brooks, Meltzoff, Kuhl, 2015). Although certain educational toys, recordings, and videos may provide learning enrichment for preschool-aged children, there are no data to support the claim that these educational materials have beneficial effects on infants and toddlers. In fact, evidence suggests the contrary, in that media may actually adversely affect the language development of infants and toddlers by limiting opportunities for parental language input and child speech (Christakis et al., 2009; Zimmerman et al., 2009). Thus, the back-and-forth communication exchanges between adult and baby is an essential component of language and brain development.

PARENTESE

Parentese, or infant-directed speech, is a style of communication that is used across various cultures and languages to talk with infants and young children (Grieser & Kuhl, 1988). It uses actual words and sentences as opposed to "baby talk," which simply mimics the sounds made by babies. It is characterized by varied intonation and prosody, elongated vowel and consonant sounds, repetition, and exaggerated gestures and facial expressions (Griser & Kuhl, 1988).

Research has shown that parentese helps facilitate language acquisition (Saint-Georges et al., 2013; Song, Demuth, & Morgan, 2010). Slow speech and vowel hyperarticulation may help a young child pick out words from sentences, and varying pitch at the ends of sentences may provide clues as to the boundaries of sentences and words (Saint-Georges et al., 2013; Song et al., 2010). Parentese may facilitate quicker word segmentation and thus contribute to faster speech processing (Saint-Georges et al., 2013). In addition, parentese is associated with positive affect, praise, playing, teaching, and comforting a child, and thus may influence language acquisition through a social mechanism (Saint-Georges et al., 2013).

Home Language

Home language refers to an individual's first language, or the language in which an individual is most fluent in. A growing number of children in the United States live in homes where a language other than English is spoken (National Center for Education Statistics, 2016). Language exposure is most beneficial in the language the parent or caregiver is most comfortable speaking. Speaking in a nonfluent language generally leads to simpler and grammatically incorrect phrases and thus, the amount of language the child hears is significantly reduced (Paradis, Genesee, & Crago, 2011). Learning one language well lays a foundation for learning another language (Espinosa, 2014). An extensive body of research has highlighted the many benefits of learning more than one language, including executive function and academic achievement, and no scientific evidence indicates that learning two languages significantly delays a child's acquisition of the second language (Bialystok, 2001; Espinosa, 2014; Head, Baralt, & Darcy Mahoney, 2015). By reinforcing the primacy of the home language, children will be exposed to more complex ideas, abstract thoughts, expanded vocabulary, which are all crucial for children to development important cognitive and language skills necessary for educational success (Paradis et al., 2011).

INTERVENTIONS

Efforts to promote early language exposure and improve children's language development have focused on training parents to read, talk, and interact more frequently with their child in a way that maximizes the developmental benefits of these shared experiences. Previously developed or existing interventions generally fell into at least one of five categories: (a) a book distribution program with anticipatory guidance for shared-book reading, (b) teaching dialogic reading techniques, (c) coaching parents to talk more with their child, (d) training parents to be responsive to their child's focus of attention and communication initiations, or (e) public awareness campaigns. Such programs are appropriate for enhancing literacy and language development, because evidence suggests that aspects of parent–child interactions associated with a child's language development include (a) amount of parent-child interaction, (b) amount and quality of linguistic input, (c) responsiveness of child's communication, and (d) the use of language-learning support strategies, such as book-reading (Hart & Risley, 1995; Roberts & Kaiser, 2011; Rowe, 2012; Weisleder & Fernald, 2013; Zimmerman et al., 2009). Most articles reported positive changes in parental behaviors, including frequency of shared book-reading and parent–child interactions, greater attention to child's communication, and encouragement of the child's participation in conversations and book reading (Glanemann, Reichmuth, Matulat, & Zehnhoff-Dinnesen, 2013; Girolametto et al., 1994; Knoche, Sheridan, Edwards, & Osborn, 2010; Landry, Smith, Swank, & Guttentag, 2008; Roberts & Kaiser, 2012). These changes were accompanied by improvements in children's receptive or expressive language skills (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Landry et al., 2012; Mendelsohn et al., 2005; Sheridan, Knoche, Kupzyk, Edwards, & Marvin, 2011; Tannock, Girolametto, & Siegel, 1992; Whaley, Jiang, Gomez, & Jenks, 2011). Furthermore, knowledge about child development increased as a result of these interventions (Suskind et al., 2015). A few interventions that have a strong evidence base or are implemented through pediatric providers are highlighted in this article as exemplars. A more complete list and description of these interventions can be found in the Table.

Factors that have contributed to the successful implementation and dissemination of interventions include the simplicity of the messaging; well-defined and straightforward mission and tasks; the support of the intervention within the pediatric profession; communicating about the intervention though published articles, media, continuing education courses; and the generation of data showing its effectiveness.

All of the interventions discussed here use the concept of Language Nutrition. The goal for all of the programs is to enrich the language interactions that young children have with their caregivers. All of the programs reach their goals through Language Nutrition in various settings and with different pediatric providers and educators reaching the families. Although there are multiple ways in which parent-based interventions can be designed and delivered to parents, incorporating literacy and language promotion into pediatric primary health care represents a promising platform for the delivery of parent-based interventions for young children.

Pequeños y Valiosos (Young and Valuable)

Pequeños y Valiosos is a national public action campaign that aims to help optimize learning in everyday moments for Hispanic children under the

TABLE. Intervention descriptions

Intervention	Description
Dialogic Reading	Trains parents to use interactive reading techniques during book reading that follow the child's interest and invites the child to participate in story-telling by • establishing joint attention (following child's lead) • facilitating conversational turns • using strategies to expand child's vocabulary
Enhanced Milieu Teaching	Facilitates children's language use in everyday contexts by following a teach–model–coach review approach consisting of 28 1-hour sessions with the parent and child.
Getting Ready	Early childhood professionals in the Head Start program promote parent–child interaction and language-developing behavior during home visits by • educating parents about childhood development • recognizing parental strengths, modeling behaviors to parents, and providing feedback
Muenster Parent Program	Delivers information to parents through lectures, video demonstration, and feedback from trainers during six group sessions and two individual sessions, which build skills to • follow the attentional focus of the child • facilitate teaching of words through reacting to child's communication • enhance parental responsiveness to vocal and nonvocal communication from the child
Pequeños y Valiosos	National public action campaign targeted for the Hispanic population that encourages talking, reading, and singing to young children through radio and network programming and social media http://www.univisioncontigo.com/en/education/early-childhood/
Play and Learning Strategy	Over a series of 10 visits, using video demonstrations and by videotaping the mother interacting with her child and providing feedback, mothers are coached to • increase responsive parenting behaviors • establish joint attention with the child • provide rich language input and opportunities for scaffolding language https://www.childrenslearninginstitute.org/programs/play-and-learning-strategies-pals/
Providence Talks	Initiative in Providence, RI that involves having families with children younger than 2 years conduct home recordings using LENA technology and receive coaching and feedback on collected data biweekly by a home visitor. www.providencetalks.org
Reach Out and Read	Incorporates literacy promotion into pediatric primary care well checks for children 6 through 60 months old by • providing anticipatory guidance about shared reading • distributing books www.reachoutandread.org
Talk With Me Baby	Statewide initiative in Georgia to integrate coaching about language-rich interactions as a core competency of nurses and WIC nutritionists www.talkwithmebaby.org
Thirty Million Words Initiative	Delivers eight educational computer-based modules through 1-hour home visits with a trained coach, strengthening the ability of parent language to build a child's brain and narrow the achievement gap. Parent–child interactions are recorded during home visits for feedback purposes. Additionally, LENA technology is used by the coach to provide feedback, allowing parents to set goals and recognize progress. www.thirtymillionwords.org
Too Small to Fail: Talking is Teaching	Public awareness campaign that • delivers tips and videos to parents about building their child's vocabulary through text messages on an app called ''Text4baby'' • delivers messages regarding language primacy through partnerships with Sesame Street and Scholastic http://talkingisteaching.org/
Video Interaction Project	Incorporates one-on-one sessions with a child development specialist into low-income pediatric primary care visits for children 2 weeks through 36 months in which • parents are videotaped interacting with their child for 30 to 45 minutes • specialist reviews videotape with parents and provides feedback and strategies for enhancing interactions www.videointeractionproject.org

Note. *LENA, Language Environmental Analysis; WIC, Women, Infants, and Children.*

age of 5 years by targeting parents/caregivers and broader Hispanic community (Univision Communications, 2016). Through a partnership with Univision, the leading media company serving the Hispanic population, and Too Small to Fail, a public awareness and action initiative of the Clinton Foundation that mobilizes communities to improve the health and well-being of young children, Pequeños y Valiosos delivers

information to the Hispanic population across Univision platforms, radio and network programming, social media, and local community outreach to encourage talking, reading, and singing to children (Univision Communications, 2016).

Reach Out and Read

Reach Out and Read is a program that was started in 1989 to address low literacy skills by incorporating literacy promotion in pediatric primary care well-child visits for children 6 through 60 months old (Needlman, Fried, Morley, Taylor, & Zuckerman, 1991). Reach Out and Read includes the following three components, which are each aimed at supporting and encouraging shared reading between parents and young children: pediatric health care providers (a) provide anticipatory guidance to parents about shared reading and (b) distribute a culturally and developmentally appropriate book to the child at each well-child visit; (c) volunteers in waiting rooms of primary care clinics model reading with children and/or books are available for children to read in the waiting rooms (Needlman et al., 1991; Zuckerman & Khandekar, 2010).

Reach Out and Read has developed into a nationwide early literacy intervention. With endorsements by the American Academy of Pediatrics, Reach Out and Read has been adopted by over 5,000 hospitals and health clinics throughout the United States, reaching 32% of children below the poverty level, and has been adapted in over a dozen countries (Zuckerman & Khandekar, 2010). The success of this intervention is rooted in its simplicity and in support and dissemination at a grass-roots level through physician champions (Zuckerman, 2009).

Increased frequency of shared reading and improvements in child language development have been documented by studies evaluating Reach Out and Read (Needlman, Toker, Dryer, Klass, & Mendelsohn, 2005; Zuckerman & Khandekar, 2010). The anticipatory guidance component of Reach and Read was associated with the greatest increase in shared reading, which highlights the importance and influence of the education provided by health care providers on parental behavior concerning literacy-promoting activities (Sharif, Rieber, & Ozuah, 2002).

Several other book distribution programs modeled on Reach Out and Read have been developed and successfully implemented in health care settings, such as the neonatal intensive care unit; at discharge from the well-baby nursery; and in the Women, Infants, and Children clinics (Lariviere & Rennick, 2011; Moore & Wade, 2003; Veldhuijzen van Zanten, Coates, Hervas-Malo, & McGrath, 2012; Whaley et al., 2011).

Talk With Me Baby

Talk With Me Baby (TWMB) is a statewide initiative in Georgia to dramatically transform the understanding, will, and skill of all parents and caregivers to become conversational partners with their babies and children (Talk With Me Baby, 2015). This cross-sector coalition is integrating coaching about language-rich interactions as a core competency of two key large-scale workforces of trusted professionals that already serve most parents and babies—nurses and Women, Infants, and Children clinic nutritionists, who see 99% and 50% of all new and expectant parents in Georgia, respectively. TWMB has created a continuing education program to teach nurses how to coach parents on the provision of language-rich interactions and to encourage nurses to model language-rich interactions in their own interactions with infants and children (Talk With Me Baby, 2015). TWMB has also developed resources for parents to use to encourage conversations with their young child, including a smartphone app called "Let's Talk!" and videos showing how parents can incorporate talking and interacting with their baby into their daily life. TWMB has partnered with Scholastic to produce books for children that emphasize the importance of language-rich interactions for a young child's literacy and language development. Currently, evaluation studies are being conducted to evaluate the efficacy of this initiative in both outpatient and inpatient settings.

Thirty Million Words Initiative

The Thirty Million Words (TMW) Initiative is a program designed to strengthen the ability of parent language to build a child's brain and narrow the achievement gap. This initiative is delivered at the individual, community, and population level through individual coaching, social media, and a public awareness campaign in Chicago, Illinois.

The TMW project involves eight educational, computer-based modules delivered by a trained coach for 1 hour at weekly home visits (Suskind et al., 2016). These educational modules emphasize using language-enhancing strategies with daily activities and everyday contexts and provide information about child language development (Suskind et al., 2016). A simple message, called the "3 T's", is emphasized to parents: "talk more, tune in, and take turns" (Suskind et al., 2016). At the home visit, videos of the parent interacting with the child are recorded to enable the coach to review the interaction with and provide feedback to the parent (Suskind et al., 2016). In addition, the coach uses Language Environmental Analysis digital language processors, which act as "word pedometers," in which the number of words, conversational turns, and child vocalizations in a child's language environment are recorded (Gilkerson & Richards, 2009). Parents receive feedback about each of the recordings by looking at reports generated by Language Environmental Analysis, which offers a mechanism for parents to set goals and recognize their progress and instills a

sense of competency in facilitating their child's development (Suskind et al., 2016).

A randomized controlled trial of TMW showed that parental knowledge about language learning and predictors of school success dramatically improved after the intervention and was sustained 4 months after the study (Suskind et al., 2016). The intervention also resulted in an increase in adult word count, conversational turns, and child vocalizations (Suskind et al., 2016).

IMPLICATIONS FOR PRACTICE

The American Academy of Pediatrics issued its first policy statement addressing early child literacy in 2014, which established early literacy promotion, beginning in infancy, as an essential component of pediatric practice (High & Klass, 2014). This policy recommends that pediatric health providers receive training about literacy promotion and that they provide anticipatory guidance about early literacy promotion and how parents can provide opportunities for their child to learn (High & Klass, 2014).

The workforce of pediatric nurses and nurse practitioners is well positioned to build the capacity of parents to interact with their infants and young children in a way that promotes language learning, given many scheduled touchpoints: the frequency and near universality of these visits allow for an intervention, or educational and health messages, to be delivered and reinforced on a regular basis by capitalizing on an already existing infrastructure. Pediatric nurses and providers are uniquely qualified to deliver messages regarding the importance of shared book reading, talking with a child, and engaging social parent–child interactions given that part of pediatric well-child visits includes assessment of developmental milestones, as well as parent education and anticipatory guidance on health and development.

> Pediatric health care providers can incorporate language promotion practices into everyday tasks in early childhood checkups, sick visits, or hospital stays.

Pediatric health care providers can incorporate language promotion practices into everyday tasks in early childhood checkups, sick visits, or hospital stays. Coaching should include both the "why" and the "how" to engage in language-rich interactions and the demonstration of such an interaction. Strategies such as motivational interviewing and the teach-back method can help providers assess parents' understanding and will to engage in language-rich interactions with their child.

Teaching "Why"

As part of anticipatory guidance at well-child visits, pediatric health care providers discuss development and developmental expectations and assess whether the young child is meeting their developmental milestones. The American Academy of Pediatrics recommends that providers ask about shared book reading and television exposure, which could be a way to lead into discussing Language Nutrition (Hagan, Shaw, & Duncan, 2008).

As mentioned, all parents and caregivers interact and communicate with their infant or young child, but disparities exist in the amount and quality of these interactions. Merely asking parents or caregivers whether they read or talk with their baby and saying that it is important that they do so will not convey the importance of Language Nutrition for their baby's future health and academic success. Research has shown that when parents understand the implications of their actions and understand child development, their behavior changes (Suskind et al., 2016). Examples of messages to tell parents "why" can be found in Box 1.

Teaching "How"

In addition to understanding the importance of Language Nutrition for a child's health and educational trajectory, families need to be equipped with tools to implement practices into their daily lives. A powerful way to teach "how" is through modeling Language Nutrition with infants and children. Greet the baby or young child when entering the room and narrate the examination to the child. Direct questions and comments

BOX 1. Teaching why

- You have the ability to be your baby's first and best teacher simply by talking and interacting with him or her.
- Talking with your baby builds your baby's brain.
- Even if your baby is not able to talk yet, your baby is actively learning the words you speak.
- Your baby is able to recognize your voice and is capable of learning language even before birth.
- It is easier for your baby to learn at an early age because the brain is growing more rapidly in the first 3 years of life than at any other time.
- The more words you speak to your baby, the more words he or she will know, which will help him or her do better in school.
- Doing better in school leads to better health, a higher chance of graduating from high school/college, and a lower chance of imprisonment.
- Talking with your baby is a great way to build an emotional bond.
- By talking with your baby, you are teaching your baby how to engage socially with other people.
- The single strongest action you can take to increase your child's educational opportunities is to talk with your baby.

to the infant—realizing that parents will supply the answers. Directing the conversation to the baby provides families with an example to follow and reinforces the importance of Language Nutrition.

Pediatric health care providers should tell families to make the baby their conversational partner as often as they can. As they go throughout their day, they can narrate what they are doing and point out objects in the environment as a way to introduce new words. Families should pay attention to the baby or young child's social and verbal communication, whether it be the child looking at something, pointing to something, babbling, or using actual words. Responding to the child's communication, even if it is nonverbal, and asking the child questions facilitates reciprocity and, thus, language learning in a social context. Reading children's story books and singing songs on a daily basis will help establish daily practices of literacy promotion. Additionally, families should be encouraged to speak using parentese and the home language. Messages to share with families about "how" can be found in Box 2.

Many of the established interventions highlighted in this article have Web sites that provide additional information and resources, including handouts, educational curricula, and early literacy milestone checklists and videos for health care providers and/or parents. Web sites of the interventions are listed in the Table.

BOX 2. Teaching how

- Talk with your baby every day and as much as you can.
- Narrate daily activities to your baby, such as changing diapers, feeding, or bathing. Describe to your baby what you are feeling and doing.
- Respond to your baby's lead. Tune in to what your baby looks at and the expressions and babbles your baby makes.
- Ask your baby questions and encourage your baby to answer with facial expressions, gestures, coos, babbles, and words. This back-and-forth communication helps them learn.
- Talk to your baby in a sing-song voice. This type of talking helps your baby learn words.
- Use actual words when you talk with your baby.
- Repeat words and phrases.
- Praise your child when he or she communicates.
- Talk with your baby in the language you are most comfortable using, because you will help your baby learn best by speaking in the language you know most.
- Use gestures to communicate with your baby.
- Introduce new vocabulary through singing, reading, and telling stories.
- Avoid use of TV or music recordings for language development. TV and recordings do not help babies learn new words.
- You do not need fancy toys, books, or to even know how to read to talk to your baby. You just need your words. Talk is cheap!
- Encourage others who spend time with your baby to talk with your baby.

CONCLUSION

The ability to provide Language Nutrition is crucial for shaping the social, learning, and health outcomes of young children (Head Zauche et al., 2016). All parents and caregivers are capable of being their baby's first and best teacher; all parents know how to talk and can talk, either verbally or through sign language. Toys and books are not necessary for a family to be successful in influencing their child's chances for academic success. Consistent with evidence, the single most important action a parent can take to positively influence their child's future health and educational trajectory is to talk with their children (Talk With Me Baby, 2015). By sharing these messages with families, pediatric health care providers can build the capacity of families to talk with their children in a way that promotes their linguistic, cognitive, and social development. Thus, pediatric providers have the potential to leverage dramatic results for children's academic and health outcomes and be partners in the efforts to close the nation's educational achievement gap.

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