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Christine McLean, Linda Black, & Frederick Ezekiel, University of Toronto

Published online: March 3, 2016

Edition period: Volume 2, 2015

To cite this article: McLean, C., Black, L., & Ezekiel, F. (2015). Supporting language during sensitive periods of development. *The International Journal of Holistic Early Learning and Development*, 2, 77-90.

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Supporting Language During Sensitive Periods of Development

Christine McLean
University of Toronto

Linda Black
University of Toronto

Frederick Ezekiel
University of Toronto

Abstract

This paper provides an overview of literature specific to factors affecting language development during the early years of human development. The influences of attachment, parenting, and home environment are discussed, along with the research pertaining to genetics, the environment, and critical and sensitive periods specific to early language development. Prevention and early intervention models are then described, culminating in recommendations on how to directly and indirectly support language development during the first five years of life.

We know that during infancy and early childhood, emerging communication skills and learning capacity develop at an extremely rapid rate. Communication, particularly language, plays a major role in children’s learning. Language is a mechanism for thinking. Language allows children to imagine, create new ideas and share ideas with others. It provides a remarkable lens into their thinking and understanding. Relationships are enriched when adults take time to listen and converse with children. (Science of Early Childhood Development, 2015, para. 1)

This paper presents an overview of the complex research surrounding language development and the possibility that there are sensitive periods of language development. With this possibility in mind, recommendations have been drawn from existing policy documents and frameworks that are intended to focus scarce governmental resources in places that will make the most difference for children in need of language intervention. This article begins with a literature review examining language development with a focus on the role of attachment, parenting, and home environment on language development as well as critical and sensitive periods and genetic and environmental influences on language development. The article also provides information on effective prevention and early intervention models that support healthy language development for all children. The second half of the paper provides recommendations on how to best support children’s language development during the sensitive periods of development, recognizing the importance of investing in the early years for all citizens.

Literature Review

Language Development

“Language is at the heart of all learning” (Penn, 2014, p. 67).

Language acquisition is closely linked to a child’s academic success and later life outcomes. The rate of language acquisition and proficiency varies widely in childhood. The child’s family is the first and most critical socializing agent and determinant of a child’s early language. According to Hart and Risley (1995):

So much is happening to children during their first three years at home, at a time when they are especially malleable and uniquely dependent on the family for virtually all of their experience, that by age 3, an intervention must address not just lack of knowledge or skill, but an entire general approach to experience. (p. 11)

The key predictive factor that affects differences in early language growth is the differential exposure to language. Parents who talk directly to their children, along with using more gestures and richer vocabulary, raise children who have greater vocabularies and language processing skills (Weisleder & Fernald, 2013). Quantity and quality of language inputs in the early years are related to lexical and grammatical development in children. Further, correlations have been identified between quality and quantity of language inputs from parents and socioeconomic status (SES). By this standard, it appears that a greater number of children from low SES homes are at risk for developing a language deficit, as they may not experience the same quantity and quality of language inputs (Rowe, 2012). Research suggests that children who experience more

child-directed speech at 19 months have larger vocabularies at 24 months (Hoff, 2004; Weisleder & Fernald, 2013). Interestingly, according to Weisleder and Fernald (2013), simply overhearing language directed towards other children or adults does not result in increased vocabulary. Rather, it appears that language experiences immediately linked to a child's ongoing actions, experience and interactions are what is most beneficial to the child's language development. Additionally, speech infants hear before one year of age influences their speech perception abilities (Cristia, Seidl, Junge, Soderstrom, & Hagoort, 2014). Infants exposed to direct, richer language input are more efficient at language processing (Hurtado, Marchman, & Fernald, 2008). Similarly, a study by Hart and Risley (1995) showed that the measures of accomplishments at age 3 predicted measures of language skill at age 9-10. The vocabulary used at age 3 was also predictive of measures of language skill at age 9-10. Gaps in language outcomes between children in poverty and children who live in affluence point to consistent correlations between SES and language development outcomes. As indicated by research identified above, this could be due to a variety of factors influencing both children and parents across SES, including: parental educational achievement; number of hours worked by parents; financial stress; parent mental health and wellbeing; pressures experienced by single parents; parent-child attachment; and quality of the home learning environment.

Attachment: Effects on language development. Language development is highly associated with maternal sensitivity, responsiveness and attachment. "Maternal sensitivity and responsiveness are not only important factors relating to early language development; they are also important aspects of attachment. The more sensitive and responsive a mother is, the better the quality of attachment between mother and infant" (Day, 2007, p. 144). Early intervention programs specific to language development are most effective when implemented early and in the home environment. Interventions focused on enhancing attachment security in children may be able to better target families with children who are at risk for both attachment problems and language delays (Day, 2007).

Several factors can negatively influence attachment and language development during the early years, including: parenting styles; child variables such as low birth weight, developmental delays, and genetic predispositions; and socio-demographic factors such as chronic unemployment and low education levels associated with poverty (Day, 2007; Pungello, Iruka, Dotterer, Mills-Koonce, & Reznick, 2009). One of the most commonly identified factors associated with children at risk for language delays and poor academic achievement is low SES. According to Collins and Dennis (2009):

Although myriad risk factors for reading difficulties exist...poverty and underdeveloped oral language skills can each be problematic to children's success in reading...when combined, these factors are especially deleterious to literacy achievement. Together, these factors appear central to both early and persistent deficits in literacy achievement, and to the achievement gap that is of great concern to policymakers, educators, and researchers. (p. 246)

Parenting and the home learning environment: Effects on language development.

Higher home learning environment [scores were] associated with increased co-operation/conformity, peer sociability and confidence, lower anti-social and worried/upset behavior and cognitive development scores. The effect on cognitive development was particularly pronounced. After age, it was the variable with the strongest effect on cognitive development. Its effect was stronger than both social class and parental education, which have often been found to be amongst the strongest predictors of children's cognitive development in previous studies. The importance of the home learning environment indicates that what parents do is more important than who parents are. (Melhuish, Sylva, Sammons, Siraj-Blatchford, & Taggart, 2001, p. ii)

Parents are commonly acknowledged as children's first language teachers. In a meta-analysis of parent-implemented language interventions, Roberts and Kaiser (2011) concluded that parents play a critical role in their children's language development and that teaching parents to support language development is an essential component of any effective early language intervention. This is especially true for families living in stressful environments. According to Arruabarrena and de Paúl (2012), research evidence supports the need for implementing early intervention programs for children and families who are at risk of experiencing toxic stress and these programs should begin as early as possible so that more costly and less effective remediation programs can be avoided. In the comprehensive, longitudinal Effective Provision of Pre-School Education (EPPE) Project undertaken in the U.K., one of the major findings was that "for all children, the quality of the home learning environment is more important for intellectual and social development than parental occupation, education or income" (Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2004, p. 1). A subsequent analysis of interviews from a sample of parents involved in the study showed that the quality of the home learning environment was the most significant factor in predicting children's learning outcomes when other background factors were taken into account (Siraj-Blatchford, 2010).

There are a number of activities undertaken by parents in the home that have a positive effect on children's language development (Sylva et al., 2004). These include reading with the child, teaching songs and nursery rhymes, painting and drawing, playing with letters and numbers, visiting the library, taking children on visits, and creating regular opportunities for them to play with their friends at home. In their study focusing on the effectiveness of parent-implemented language interventions, Roberts and Kaiser (2011) found that interventions should focus on socially communicative interactions between parents and children. These interventions should be taught and modeled at home through everyday ordinary routines. According to Roberts and Kaiser (2011), these training sessions need to occur about once per week in order to have an impact on child language outcomes. Understanding how to best support early language development through policies and programs and refining target time periods for intervention require an understanding of critical and sensitive periods for language learning. We will explore these sensitive periods in the next section of this paper.

Critical and Sensitive Periods Defined

Critical periods were originally conceptualized by Konrad Lorenz as short, sharply defined developmental periods where specific learning and exposure were essential to achieve

developmental outcomes (Thomas & Johnson, 2008). It was thought that if said learning and exposure were absent, negative long-term effects on development of certain functions would be irreversible (Thomas & Johnson, 2008). Ongoing research has indicated that while learning within a critical period plays an important role, residual plasticity exists outside of critical periods and a variety of factors can influence the termination of critical periods. Understanding that critical periods are often not as sharply defined as originally thought, many researchers now refer to these important periods of development as sensitive periods (Thomas & Johnson, 2008; Uylings, 2006; White, Hutka, Williams, & Moreno, 2013). The term “sensitive periods” will be used for the remainder of this paper.

Sensitive periods occur in the refinement of a variety of sensory, perceptual, and cognitive domains. The duration of these sensitive periods is linked to ongoing development of functional networks in the brain through processes of neural migration, proliferation, and dendritic expansion, followed by myelination and synaptic pruning (Hensch, 2005; Huttenlocher, 2002; Thomas & Johnson, 2008; Uylings, 2006; White et al., 2013). In other words, physiological processes support the specialization and organization of neurons into functional brain networks that subserve specific functions such as language comprehension. Processes underlying development of functional brain networks rely on interactions between maturational and physiological processes and exposure to relevant stimuli or experiences, such as language inputs from caregivers (Hensch, 2005; Huttenlocher, 2002; Thomas & Johnson, 2008; Uylings, 2006; White et al., 2013).

While specific regions of the brain develop at different rates, the formation of new synapses between neurons accelerates at 26 weeks of gestation with continued growth through the first 2 years of life (Fair et al., 2007; Hensch, 2005; Kelly et al., 2005; Ruben, 1997; Uylings, 2006). Synaptic numbers typically peak between two to four years of life; at this point, short-range connections in the brain begin to decrease while long-range connections strengthen through processes of synaptic pruning and axonal myelination (Huttenlocher, 2002; Uylings, 2006). Sensitive periods often occur during the window between the peak of synaptic density and the time when synaptic numbers and organization of long-range connections begin to reach a more stable, mature profile (Uylings, 2006). This shift from widespread synaptic connectivity to more refined and organized long-range connectivity profiles corresponds with a shift from broad to narrow tuning of neural responses to various stimuli through sensitive periods (White et al., 2013). Plasticity appears to reduce in low-level sensory systems before it does in higher-level cognitive systems, corresponding to the relatively protracted development of associational areas of the neocortex relative to primary sensory cortices. As a result, sensitive periods for the development of functions such as language, which relies on the auditory system, occur earlier in development compared to cognitive functions such as attention and behavioral inhibition (Huttenlocher, 2002; Thomas & Johnson, 2008).

Sensitive Periods for Language Development

Multiple sensitive periods exist within each sensory modality (Huttenlocher, 2002; Ruben, 1997; Uylings, 2006; White et al., 2013). The development of specific aspects of language is related to environmental exposure during sensitive periods, and first relies on auditory reception (Ruben, 1997). Auditory reception involves both detection and identification of sounds: the ability to experience auditory stimuli, and subsequently differentiate specific sounds from one another (Ruben, 1997). A fetus at 26 weeks of gestation can detect sounds, and newborns demonstrate the ability to identify and discriminate specific sounds through demonstrated preferences for

their mother's voice (Ruben, 1997). Through exposure to language, infants' ability to detect and identify language sounds becomes refined primarily in the first 2 years of life (Ruben, 1997; White et al., 2013).

Sensitive periods have been identified for three specific attributes of language: phonology, syntax, and semantics. Phonology is defined as the basic structure of auditory stimuli – in other words, the physical characteristics of sounds that make up a language (Ruben, 1997). Each language is characterized by specific phonetic attributes or sounds that make up the repertoire of words within the language. Through sensitive periods of phonological development, fetuses and infants develop auditory tuning specific to phonemes that are present in the native language (L1) they have been exposed to. While infants at birth show some preference for the native language of their parents, they are still able to discriminate phonemes from a variety of languages up until 6-8 months of age. By 10-12 months of age, phonetic discrimination becomes specific to L1; this indicates that L1 exposure leads to narrow tuning of auditory cortex to respond selectively to the phonetic characteristics of the native language. This narrowing of response profiles promotes efficient processing of stimuli prevalent in the infant's native language, while also limiting detection and discrimination of phonemes specific to other languages, demonstrating early limitations on capacities to learn a second language (L2). Overall, the sensitive period for phonetic development appears to take place from 5 months of fetal development to 12 months of infancy, making language exposure important during these very early months (Ruben, 1997). Early language exposure and phonetic development support language outcomes throughout early childhood and adolescence; children with early language exposure in the first year of life have better outcomes with regard to development of semantic and syntactic components of language later in life (Ruben, 1997).

Syntax represents the complex set of grammatical rules and language structures that guide the organization of words in a language to form meaningful sentences and paragraphs. Language exposure in the first 4 years of life is important for the development of basic rules that inform syntax; early exposure equips children with basic skills they need to form more complex sentences and paragraphs as their language skills develop later in life (Ruben, 1997). Semantics refers to the meaning associated with specific words, and relies on mapping between specific sounds (words) and the constructs they represent (Ruben, 1997). Vocabulary development extends through adolescence and into young adulthood indicating extended plasticity in this system. Semantics is the component of language that has the least stable and sharp sensitive period, with plasticity extending well into the teenage years (16-18 years old) (Ruben, 1997). While phonology, syntax, and semantics represent three dimensions of language, their development through sensitive periods does not happen in isolation. Specifically, language exposure in utero during the last 4 months of gestation and during the first year of infancy appears critical for the development of language-specific phonological representations, which influence language outcomes across all three dimensions throughout development (Ruben, 1997). The development of language through each of the sensitive periods outlined above is influenced by a complex interplay between genetic and environmental factors.

Genetic and Environmental Influences on Sensitive Periods of Language Development

Developmental processes during sensitive periods and constraints on plasticity that influence the onset and termination of sensitive periods are related to a complex set of genetic and environmental influences (Thomas & Johnson, 2008; Uylings, 2006; White et al., 2013). While genetic influences set the maximum constraints of development, exposure to stimuli through The

environmental factors plays an important role in biological processes that influence plasticity of the developing brain. Specifically, the tuning of the connectivity profile of the brain is directly influenced by exposure to environmental stimuli. Processes of axonal myelination and synaptic pruning, which are related to sensitive periods, are guided by exposure to specific stimuli. Broad to narrow tuning of auditory discrimination allowing for language-specific phonetic processing is directly influenced by that narrowing of connectivity profiles in auditory tonotopic maps, forming stimulus categories that respond to specific phonemes (Thomas & Johnson, 2008; Uylings, 2006; White et al., 2013). Exposure to language, the most important environmental influence on development of language, forms a lasting imprint on the developing brain that influences language outcomes throughout development (Cristia et al., 2014; Ruben, 1997).

While processes that guide the initiation and termination of sensitive periods are not fully understood, they appear to be moderated by gene-environment interactions. Evidence has shown that infants born with blindness due to bilateral cataracts have an extended critical period for the development of visual processing once sight is restored (Thomas & Johnson, 2008). Possible gene-environment interactions influencing the termination of critical periods have been described through three separate theories; evidence exists supporting each of the following theories, indicating that a combination of these processes likely influences sensitive period termination (Huttenlocher, 2002; Thomas & Johnson, 2008).

1. Termination of plasticity due to maturation – biological plasticity is reduced as the functional connectivity profile of the brain matures into a more stable representation through synaptic pruning and myelination.
2. Self-termination of learning – the process of learning itself utilizes limited neural resources and forms stable neural representations; subsequent learning (i.e., learning a second language – L2) must compete for limited neural resources already occupied by pre-existing learning (L1).
3. Stabilization of constraints on plasticity – behavioral functions become more stable over development and reduce demands for plasticity in the brain. When demands are increased for the development of specific functions, accommodation can still occur later in life.

Prevention and Early Intervention

Defining vulnerability. More than 25% of Canadian children arrive at kindergarten having difficulty with basic language, self-help and self-regulatory skills (Kershaw, Warburton, Anderson, Hertzman, Irwin, & Forer, 2010). These children are considered vulnerable or “high-risk” in terms of later academic achievement (Pungello et al., 2009). Reducing vulnerability rates through family and educational supports and services aimed at both early intervention and prevention has immediate short term, medium term and long-term benefits for individuals, families and society (Bradley & Corwyn, 2002; Collins & Dennis, 2009; Kershaw, Anderson, Warburton, Hertzman, 2009; Kershaw et al., 2010; Roberts & Kaiser, 2011). Studies into adulthood indicate that educational success is followed by increased success in employment, social integration and sometimes reduced criminality. There is also an indication of improved outcomes for mothers. The improvements appear to occur for those problems that are endemic for a particular disadvantaged group (Melhuish, n.d.).

Effective prevention and early intervention models. According to Melhuish (n.d.), the most effective form of intervention currently researched appears to be a combination of both high quality childcare and associated home visits. Siraj-Blatchford (2010) emphasized that disadvantaged parents do not need to be persuaded to provide additional support for their children and, in fact, disadvantaged and minority ethnic families are more positively disposed towards involvement than their middle-class and professional peers. “The desire to become more involved has consistently been found to be stronger among disadvantaged groups, i.e. those in lower social grades, minority ethnic groups, respondents with a long-term illness or disability” (Siraj-Blatchford, 2010, p. 475). Siraj-Blatchford (2010) also found that families make the extra efforts required to develop a rich home learning environment when they believe their efforts will be rewarded. Parents’ efforts to interact with their child and provide needed supports during the early years help to decrease early social disadvantages due to poverty, language, or cultural barriers (Siraj-Blatchford, 2010).

When program-based interventions are provided, it is essential that the service providers are well-trained, skilled interventionists (Melhuish, 2011; Roberts & Kaiser, 2011). If the quality of care is low, children will show lower language development than if receiving high-quality childcare or no childcare whatsoever (Melhuish, 2011). Collins and Dennis (2009) found that small-group settings focusing on children’s oral language development allowed for: a narrowed focus on one particular subject; additional time and attention to the children’s individual questions, understandings or confusions; and opportunities to talk, respond to the teacher’s questions, and comment on pictures or objects – all of which created higher quality learning environments. As a result of these small-group experiences, children were more motivated to be curious about objects, events and concepts, they benefited from the scaffolding opportunities to talk with peers, they were provided with a model for discourse skills, and they were supported by peers’ prosocial behaviors.

Programs targeted at a particular demographic do not appear to be as effective as those that include a socially mixed group. In a literature review on the impact of early years provision on young children from disadvantaged backgrounds, Melhuish (n.d.) concluded, “with regard to provision for three years onwards, disadvantaged children benefit particularly from high quality preschool provision. Also, children benefit more in socially mixed groups rather than in homogeneously disadvantaged groups” (p. 4).

Childcare as a prevention and early intervention. The longitudinal EPPE study conducted in the U.K. indicated that children, especially from age 2 upwards, benefit from high quality childcare environments, and that these benefits are more pronounced in children from disadvantaged backgrounds. “The evidence on child care for the first three years for disadvantaged children indicates that high quality child care can produce benefits for cognitive, language and social development. Low quality child care produces either no benefit or negative effects” (Melhuish, 2011, p. 4). It appears that in addition to quality, quantity of time spent in an early learning setting is an important variable as well. Two significant EPPE findings were that preschool experience, compared to none, enhances all-around development in children, and duration of attendance (in months) is important. An earlier start is related to better intellectual development. However, fulltime attendance led to no better gains than did part-time attendance (Sylva et al., 2004).

Pascal’s (2009) report *With Our Best Future in Mind*, which provided a blueprint for early years education reform in the province of Ontario, Canada, stated, “Early childhood programs help to compensate...for difficult home and community environments, at the same time as they

support parents to work or upgrade their job skills, [and] are highly effective at reducing the rate and depth of family poverty” (p. 11). Lifting children and their families out of poverty supports language and cognitive development by reducing stress in the home environment and by providing socialization opportunities for parents (E. C. Melhuish, personal communication, March 19, 2015). Opportunities to socialize with other parents, either at work or as a result of involvement in early childhood programs, provide parents with the chance to learn from other parents through conversation and informal observation. Parents of young children, especially those living in poverty, can experience isolation and a lack of parenting role models. Attachment to the workforce and attachment to an early learning program can help to alleviate this isolation (E. C. Melhuish, personal communication, March 19, 2015).

Proportionate Universality

Proportionate universality describes programs which are universally available but with a scale and intensity proportionate to the level of disadvantage (Marmot, 2006). Given that early intervention appears to be an effective support for early language development, especially for children who appear to be at high risk in terms of later academic achievement, the question arises as to whether these early intervention services should be targeted specifically to the high-risk population or be made universally available. According to researchers at the Human Early Learning Partnership (HELP) (2011), located at the University of British Columbia:

Targeting programs toward children who are most vulnerable has the potential to reach children in the greatest need. But targeting also has substantial challenges. First, targeted solutions can reach the most vulnerable children in low SES ranges in a more intensive way, and so possibly improve outcomes for these children. However, as the largest number of vulnerable children is in the middle class, the majority of vulnerable children are missed. Second, targeting programs in itself does not eliminate barriers to access – barriers such as the stigma associated with some programs continue to affect families. Targeting alone then, does not flatten the social gradient overall and improve child outcomes across the whole population. (p. 3)

According to Pascal (2009):

Canadian researchers have also demonstrated that while effective early learning programs are very crucial for some, they benefit all. Vulnerable children are not limited to low-income families since many ‘vulnerabilities’ are not income sensitive. Their analyses show that the majority of vulnerable children – more than 60 per cent – live in moderate, middle-class and affluent families. While poverty is associated with risks for young children, policies targeted solely to disadvantaged communities actually miss the majority of vulnerable children. A universal approach to program provision in which dedicated poverty reduction initiatives are embedded, has been found to magnify the social, economic and academic benefits. (p. 11)

Barriers to Access

Proportionate universality recognizes that barriers to service access are significant for families with young children. This impact is substantial for families who live in low-income neighborhoods, certain cultural and immigrant groups, rural and remote areas, and non-traditional family structures. According to HELP (2012), these barriers cannot be ignored as “...these groups tend to face more challenges and be less able to get the supports they need in a child’s early years” (p. 2). Barriers can be categorized as infrastructure barriers and barriers that are relational or value based. Examples of infrastructure barriers include: unavailability of programs, cost, transportation, time offered, language spoken, and fragmentation (e.g., offered for only a specific age range or population group); and lack of information about the service. Relational barriers can include: conflicting expectations; social distance (e.g., a non-inclusive, non-welcoming atmosphere); and parental consciousness (e.g., parental awareness of the importance of high quality experiences for their children during the early years) (HELP, 2012). Cultivating an awareness of these barriers can assist both policy makers and service providers in their efforts to make early intervention services more accessible to all, and especially to those who are particularly vulnerable.

Implications and Recommendations

The timing of early experiences can matter but, more often than not, the developing child remains vulnerable to risks and open to protective influences throughout the early years of life and into adulthood. (Penn, 2014, p. 41)

The recommendations presented below recognize the essential role of language exposure and environmental influences during the first three years of life for all children; they focus on equipping those who influence child development with the knowledge and skills they need to best support children’s language development through early sensitive periods.

1. Parenting support through a home visiting program – Support the development of home visiting programs where health visitors visit all families of newborn children at predetermined times. These health visitors would be trained nurses who visit every new parent at regular intervals and more frequently as needed. Home visitors would provide new parents with information about child development, including information on language development, and can provide additional support to those families and children who appear to be at risk for later delays or difficulties.
2. Extended parental leave – Borrowing from *15 by 15: A Comprehensive Policy Framework for Early Human Capital Investment in BC* (Kershaw et al., 2009), establish an 18-month parental leave program that is available to all parents of infants, regardless of their attachment to the labor market. This recommendation would allow all parents to be with their child during the early sensitive periods of language development. Guaranteed leave, paid at a rate higher than the current 55% of maximum Employment Insurance insurable earnings, would alleviate the stresses of time and money for young families which, in turn, reduces risk factors and vulnerability for infants at an important time in their development.
3. Universal screening – It is recommended that a consistent, system-wide early identification protocol be adopted coupled with accessible intervention resources. Early detection and intervention is best facilitated by early contact with support systems such as healthcare (public

health nurse visits, family physicians) and early learning (Oberklaid, Baird, Blair, Melhuish, & Hall, 2013; Pascal, 2009). It is recommended that further research be done examining the optimal age for screening.

4. Jurisdictional cross-ministerial task force committees – Establish cross-ministerial committees from ministries responsible for Health; Education; Children and Youth Services; and Training, Colleges and Universities tasked with the mandate of reviewing programs and services related to early language development and identifying potential barriers to access for families. These committees would be tasked to support operationalization of initiatives supporting early language development.
5. Develop core curricula to build literacy among key practitioners and the general public on the importance of early child development. This curriculum would include dedicated language and literacy content and target of curricular areas of
 - high school health and physical education curriculum,
 - medical school curriculum,
 - nursing curriculum,
 - teacher training curriculum at the Bachelor and Master levels, and
 - social work curriculum.
6. High quality early learning programs – Data gathered through a review of the research as well as through personal correspondence and interviews with renowned researchers, have indicated a clear finding that language development is supported when children are provided with the opportunity to participate in high quality early learning programs. It is recommended that jurisdictions develop universally available systems of quality and affordable, accessible early learning programs including part-time and full-time options for young children ages 0-8 and their families. Early learning programs should be a continuum of services provided by well-qualified ECE professionals and should be linked to the existing education infrastructure under the provincial/territorial ministries/departments of education.
7. Proportionate universality – It is recommended that early childhood programs and services to support children and families be provided to all families irrespective of their income level or circumstance. Disadvantaged families would be given more targeted support to achieve optimal developmental outcomes for children. Effective early learning programs benefit everyone.

Conclusion

Language is the first and most special example of learning, and the symbols and meanings language gives us enables us, with enormous flexibility, to develop, continue and accelerate these processes – the coding, refining, sifting, comparing, storing, recalling and excluding. With language, we can use and call upon a spectacular amount of information in the world. (Penn, 2014, p. 87)

The impact of a society's understanding of the importance of early language development is a gatekeeper to that society's ultimate achievement by its citizens. The State of the World's Children (UNICEF, 2001) states:

Before many adults even realize what is happening, the brain cells of a new infant proliferate, synapses crackle and the patterns of a lifetime are established...Choices made and actions taken on behalf of children during this critical period affect not only how a child develops but also how a country progresses. (p. 9)

The literature review and recommendations presented in this paper recognize the importance of investing in the early years of all citizens. An investment in early language development, which recognizes the vital role played by parents during the sensitive periods of a young child's life, would pay dividends to society through increased wellness and better developmental outcomes across generations.

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Christine McLean is the Program Manager for Early Childhood Education at the College of the North Atlantic in Newfoundland and Labrador. She has a Masters of Early Childhood Education from the University of Cincinnati and is currently enrolled in a Ph.D. program in Developmental Psychology and Education at the University of Toronto. Her research interests are related to the roles that children and adults play in the co-construction of pedagogical documentation in early learning settings.

Linda Black (M.Ed., OISE-University of Toronto) is a Ph.D. student in Developmental Psychology and Education at the University of Toronto. Linda teaches in the Childhood Studies Department at Keyano College in Fort McMurray, Alberta. Linda’s research interests include the role of attachment and self-regulation in children with autism in the early years.

Frederick Ezekiel holds a Masters of Science in Neuroscience from the University of Western Ontario and is currently enrolled in a Ph.D. program in Developmental Psychology and Education at the University of Toronto. His research focuses on impacts of early life experiences on stress reactivity and academic outcomes throughout development, and the interactive effects of genes, brain development, and environment on developmental outcomes (notably outcomes related to academic performance in postsecondary education). Frederick works in a professional capacity as the Director of Research, Innovation and Evaluation (Student Experience) at the University of Western Ontario, and in this capacity conducts research in a variety of areas related to postsecondary education, including student affairs, mental health, learning outcomes measurement, and skill/career development.