Early Brain Development

Parent Knowledge in Ontario, 2011

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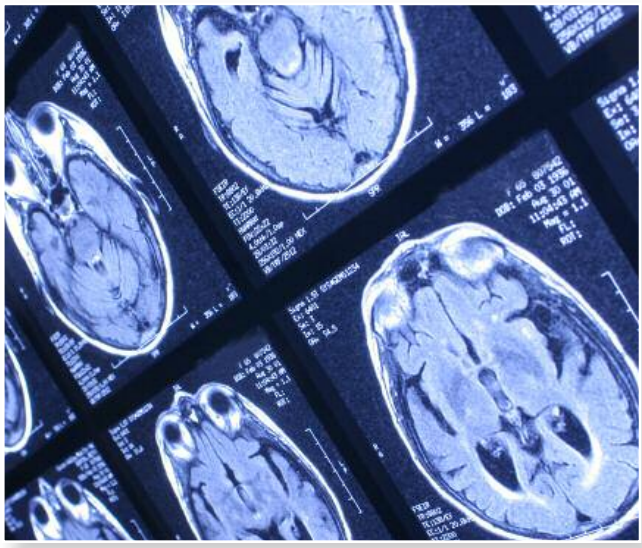
Table of Contents

SECTION 1 | Introduction

1.1 Purpose

This report describes data from the Best Start Resource Centre 2011 Ontario survey of parental knowledge about early brain development. The survey examined the attitudes and knowledge of parents of children aged 0-6 years, the information sources they relied on, and the information and resources they would find most useful related to early brain development. Survey results will help service providers think about populations of interest, key messages and effective strategies to promote early brain development. This report serves as a baseline for future surveys that examine Ontario trends in parental awareness and knowledge related to early brain development.

1.2 Early Brain Development



Over the past few decades, discoveries in the fields of neurobiology and genetics, alongside advances in the social sciences, have led to a much richer understanding of human brain development. From the moment of conception, a combination of genes and external factors (early experiences and environments) affects how genes are expressed, and how brain connections are built (National Scientific Council on the Developing Child, 2010b). While the brain remains capable of change throughout life, there is a critical period of time in early in life (National Scientific Council on the Developing Child, 2010b). This early sensitive period poses great opportunities and risks to the developing brain. Science has shown that the influence of these early experiences, positive and negative, affects the quality of the brain's connections, the very foundation for lifelong learning, behaviour and health (Council for Early Child Development, 2010; National Scientific Council on the Developing Child, 2010b).

A healthy pregnancy, caring, responsive relationships, and safe, supportive environments in the earliest years support optimal brain development (Jamieson, Bertrand, & Ibrahim, 2008). Extreme, chronic adversity, also referred to as toxic stress, can interrupt or weaken normal brain development, as well as the body's cardiovascular, immune and stress response systems, and metabolic regulatory controls, increasing the risk of lifelong physical and mental health problems (National Scientific Council on the Developing Child, 2010b).

Fortunately early identification and intervention can prevent or reverse the adverse consequences of toxic stress. Investments upfront, particularly for families and children at risk, are more effective and affordable than efforts to address resulting problems later in life (National Scientific Council on the Developing Child, 2010b). Wide ranging programs and policies to support families and children from conception through the early years can enhance the relationships and conditions needed for optimal brain development, with lifelong benefits for learning, behaviour and health.

The science of early brain development has generated a great deal of interest across sectors and around the world, raising the question of how to apply what we know to best support children in their earliest years. In Ontario, multiple stakeholders have played a role in trying to answer this question. In 1999, the Early Years Study (McCain & Mustard, 1999) was released. The report summarized the importance of, and evidence for, investing in early child development. Among its many recommendations the Early Years Study provided a blueprint for successful community-based early child development and parenting centres across the province, available for all families with young children. These centres were intended to support early brain development and positive parenting, and to be integrated into the school system and a community network of family-friendly programs, resources and supports. The establishment of Ontario Early Years Centres is an example of how Ontario is making great strides towards providing a strong start for our youngest children.

This Best Start Resource Centre survey provides information about the attitudes, knowledge and resource needs of parents of young children as they relate to early brain development. The results can be used to guide future strategies to support early brain development in Ontario.

1.3 Methodology

In preparation for an awareness campaign on the topic of early brain development, Best Start Resource Centre conducted an environmental scan, key informant interviews, and a parent survey. Please note that this report focuses only on the results of the parent survey. Key informants provided broad input about the potential campaign, and had the opportunity to provide input on the questions for this survey. Key informants included:

- Dr. Chaya Kulkarni, Director, Infant Mental Health Promotion, Hospital for Sick Children
- Dr. Charles Pascal, Professor of Human Development/Applied Psychology, OISE, University of Toronto. Special Advisor on Early Learning to the Premier of Ontario. Conseiller Principal/Senior Advisor Fondation Lucie et André Chagnon Foundation
- Dr. Jean Clinton, Associate Clinical Professor, Department of Psychiatry and Behavioural Neuroscience at McMaster, division of Child Psychiatry. Associate in Department of Child Psychiatry, University of Toronto and Hospital for Sick Children. Associate Member of Offord Centre for Child Studies
- Jane Bertrand, Executive Director of the Atkinson Centre for Society and Child Development, Human Development and Applied Psychology, OISE, University of Toronto
- Dr. Stuart Shanker, Director of Milton and Ethel Harris Research Initiative, MEHRI. Director of the Council for Human Development. Distinguished Research Professor of Philosophy and Psychology, York University
- Shivani Rikhy, Associate Scientific Director, Alberta Centre of Child, Family and Community Research (ACCFCR)
- Anne Biscaro (for Dr. Robin Williams), Director, Family Health, Niagara Region Public Health
- Dr. Magdalena Janus, Associate Professor, Psychiatry and Behavioural Neuroscience, Ontario Chair in Early Child Development, Offord Centre for Child Studies, McMaster
- Dr. Fraser Mustard, Director, Founders Network
- Dr. Carol Crill Russell, Consultant. Previous Senior Research Associate, Invest in Kids
- Maddison Spenrath (for Joanne Schroeder), Research Assistant, Fraser Mustard Chair in Early Child Development

- Martha Friendly, Coordinator, Childcare Resource and Research Unit
- Elizabeth Moreau, Director, Communications and Public Education, Canadian Paediatric Society
- Marie Gendron, Directrice Générale de la Fondation Lucie et André Chagnon
- Kate Pedlow, General Counsel and Program Officer, Norlien Foundation

In January 2011 Best Start Resource Centre implemented the on-line survey across Ontario to determine parental awareness and knowledge pertaining to early brain development, and to gauge parent information and resource needs on this topic. Leger Marketing was contracted to conduct the survey, provide data analysis, and identify findings of significance. The survey included 512 Ontario residents who, at the time of the survey, were parents of children aged 0-6 years and/or were currently pregnant. A probability sample of the same size would yield a margin of error of ±4.4%, 19 times out of 20.

The survey was completed using Leger Marketing's on-line panel LegerWeb, which has approximately 37,400 members in Ontario, with between 1,000 to 2,000 new members added each month, and a retention rate of approximately 90%. Panel members are randomly selected to receive email invitations to individual surveys. Stringent strategies are in place to ensure high data quality standards and privacy protection for respondents.

Survey sample demographics include:

BASE: Parents of children ages 0-6 years (n = 512)	Number of Respondents	Proportion of Respondents
Gender		
Female	312	61%
Male	200	39%
Parent of child between ages of 0-6 years old		
Yes	498	97%
No	14	3%
Pregnancy Status (n = 312)		
Yes	54	17%
No	258	83%
Age		
18-24 years	35	7%
25-34 years	182	36%
35-44 years	289	56%
45-54 years	5	1%
Education		
High school or less	64	13%
College pre-university, technical training, certificate	142	28%
University	301	59%
Marital Status		
Single	47	9%
Married/living together	433	85%
Widowed/separated/divorced	28	6%
Area of residence		
Urban	422	82%
Rural	90	18%
Annual household income		
Under $60,000	149	29%
$60,000 and over	301	59%

Table 1.3: Summary of Demographics of Ontario 2011 Respondents

Limitations

Limitations of this report include:

- Given the survey size, it is not possible to identify statistically valid findings for certain smaller subsets of respondents.
- The survey was conducted on-line, which may result in an under-representation of lower income, lower educated respondents, and/or respondents with less computer skills.
- The survey was completed in English, which may result in an under-representation of respondents with a first language other than English.

Leger Marketing has found that on-line surveys show similar results to telephone surveys. However, as telephone surveys only include land lines and not mobile phone numbers there is also a socio-economic bias in phone surveys.

Please Note:

Data categories in this report may add up to slightly over or under 100% as a result of rounding, and/or because response categories for "don't know" or "prefer not to answer" were not included in the data table.

Table titles indicate the population(s) represented in the data. The discussion below each table provides relevant information about sub-populations in the survey data.

In this report the term "significant" refers to findings of statistical significance with a minimum 95% confidence interval.

SECTION 2 | Survey Highlights

This section presents a summary of survey highlights, while Sections 3 and 4 explore survey findings in more detail. Implications for program planning are discussed in Section 5.

2.1 Early Childhood Development

There was a high level of knowledge regarding early emotional, social and cognitive developmental milestones. Most parents understood that:

- Long before a baby's first words, infants are able to communicate using facial expressions, sounds, cries, gestures and body language (96%).
- Social and emotional skills are as important for school readiness as intellectual skills (95%).
- The average one-year-old can understand many more words or phrases than they can say (93%).

Despite their understanding of child development, some parents felt that responding to infant cues might spoil them:

- 12% of parents felt that for infants and babies up to one year of age, their cries and signals did not indicate a genuine need for parental attention.
- 31% of respondents believed that picking up an infant every time s/he cries will spoil them.

2.2 Early Brain Development

Most parents (81%) understood that there are periods during early development when the brain is more responsive to stimulation from the environment.

There was a high level of knowledge about a number of factors that affect early brain development. Parents agreed with research findings that:

- The use of cigarettes, alcohol and drugs during pregnancy can harm the brain of the developing fetus (95%).
- Secure attachment and interactions with caring adults affect early brain development (93%).
- Children's development is determined by both genetics and the experiences and environments they are raised in (92%).
- Excessive stress prenatally and/or in the first years of life, can affect a baby's brain development (82%).

Ontario parents also had a high level of understanding (92%) of the lifelong consequences of early brain development on health, learning and behaviour. Furthermore, respondents understood the value of playtime to a child's development. Almost all parents surveyed believed that:

- Babies and children learn by playing (97%).
- Toys and play that use the five senses support early development (97%).

Many parents had mistaken beliefs about how to support early learning:

- Two out of five respondents (41%) believed that products and toys that claim to increase infant intelligence or build baby's brains are usually grounded in strong scientific research.
- Two out of five respondents (40%) thought that a greater emphasis on learning the basics (reading, writing, arithmetic) in preschool and kindergarten and less play time will help to increase a young child's intelligence.

2.3 How and When to Support Early Brain Development

Parents identified the following as the most important ways they could support early brain development:

- Providing a proper diet (44%).
- Interacting and playing with their baby or child (24%).
- Participating in stimulating and engaging activities (22%).
- Storytelling and reading aloud (20%).

Most parents (80% +), correctly identified a number of activities that could have a major beneficial impact on their child's development during the first three years:

- Play with them.
- Provide sensory stimulation.
- Read aloud.
- Provide a healthy diet.
- Provide opportunities for healthy physical activity.
- Encourage or praise their efforts.
- Cuddle or hold them.
- Establish good sleep routines.
- Provide opportunities for them to play with other children.
- Speak to them in their home language.
- Comfort them when they're upset.
- Establish routines.
- Set and enforce rules.

When asked about when parents should begin activities to support their baby's brain development, a high proportion (90%) identified the value of starting right from birth.

A significant proportion of parents also felt that nurturing their child's brain required special equipment and toys:

- Roughly one third of respondents believed the use of flash cards (34%), and various tools designed for babies and toddlers (i.e. TV, DVDs, computer programs and/or Internet Website activities or games) (32%), would have a major impact on a child's development in the first three years.

2.4 Sources of Early Child/Brain Development Information

Parents wanted to know more about how nutrition (including breastfeeding) and how early childhood education support early child development. They also wanted to know the foods/nutrition and stimulating activities that would best develop their baby's or child's brain.

Parents most frequently turned to the Internet, medical professionals, print materials (i.e. books and magazines), and family or friends for information and advice on early child development and parenting, and anticipated they would continue similar information seeking behaviour.

Parents indicated that a website is the most useful tool to help them learn about early brain development. They thought they would be most likely to access information about parenting and infant/child development through their health care provider (92%), or parent programs such as Ontario Early Years Centres (74%).

The Internet (94%), followed by television (82%) and radio (72%) were the mass media that respondents saw and heard most often.

SECTION 3 | Survey Results

3.1 Perceptions and Understanding of Early Childhood Development

SURVEY QUESTION: Please tell me how you feel emotionally when you hear the statement, *"The influence of parents during a child's early years (from birth to age 5) is absolutely critical to the way a child turns out as an adult?"*

Response to Statement	% Response
No emotional response but agreement with statement:	57%
Negative emotional response (concern, worry, apprehension, stress, pressure)	7%
Positive emotional response (happy, proud, strong, at ease, comforted, reassured)	6%
Responsible	3%
Disagree with statement	1%
Other/No answer	27%

Table 3.1a: Emotional Responses to Statement Regarding the Critical Influence of Parents During the Early Years, Ontario 2011 (responses from parents of children 0-6 years)

While the vast majority of respondents did not indicate how they felt emotionally, the majority agreed that the influence of a parent on a child's first five years is absolutely critical to the way a child turns out as an adult.

Those 35 years or older were significantly more likely than those 18-34 years to agree with the statement.

SURVEY QUESTION: Based on what you've heard or know about child development, please indicate whether you believe the following statements to be true or false:

Statements	True	False	Unsure
Long before a baby's first words appear, s/he can communicate a lot using facial expressions, sounds, cries, gestures and body language. (TRUE)	96%	1%	3%
Picking up an infant every time s/he cries will spoil them. (FALSE)	31%	57%	12%
For infants and babies up to one year of age, their cries and signals indicate a genuine need for parental attention. (TRUE)	81%	12%	7%
The average one-year-old can understand many more words or phrases than they can say. (TRUE)	93%	2%	5%
Social and emotional skills are as important for school readiness as intellectual skills. (TRUE)	95%	2%	4%

Table 3.1b: Perception of Child Development, Ontario 2011 (responses from parents of children 0-6 years)

More than 90% correctly identified that infants can communicate long before their first words, that the average one-year-old can understand much more than they can say, and that social and emotional skills are as important for school readiness as intellectual skills.

Thirty-one percent of parents believed that picking up an infant every time s/he cries will spoil them and 12% of parents believed that the cries and signals of an infant/baby did not indicate a genuine need for parental attention.

Respondents with incomes $40,000 and over were significantly more likely to answer correctly. They were more likely to believe that infants can communicate before learning words, more likely to believe that the average one-year-old understands more than they can say, more likely to believe that social and emotional skills are as important as intellectual skills for school readiness, and less likely to believe that picking up an infant every time s/he cries will spoil them.

Women, dual parents and those aged 35 years + were more likely to correctly answer the question about responding to infant cues, i.e. they were less likely to believe that picking up an infant every time s/he cried will spoil them.

3.2 Perceptions and Understanding of Early Brain Development

SURVEY QUESTION: Which of the following best describes your understanding of early brain development?

Perceived Definition of Early Brain Development	% Selected
There are periods during development, such as from birth to age five, when the brain is more responsive to stimulation from the environment. (TRUE)	81%
The brain is plastic (changeable) only throughout the first five years of life. (FALSE)	7%
At birth a baby's brain is fully developed, and their capacity for learning is pretty much set. (FALSE)	5%

Table 3.2a: Perceived Definition of Early Brain Development, Ontario 2011 (responses from parents of children 0-6 years)

The majority of respondents (81%) correctly believed that there are periods from birth to age five when the brain is more responsive to stimulation from the environment.

Dual parents were more likely than single parents to identify the correct response (83% vs. 62%). Single parents were significantly more likely than dual parents to respond incorrectly (28% vs. 3%).

SURVEY QUESTION: To the best of your knowledge, what are the three or four most important things a parent can do to support their baby's or child's brain development?

Important Ways for Parents to Support Early Brain Development	% of Total Mentions
Proper diet/nutrition	44%
Play/interact with them	24%
Stimulation/engaging activities	22%
Reading/storytelling	20%
Talk with them	18%
Love/affection/support/encouragement	17%
Enough sleep	10%
Exercise/physical activity	9%
Teach them (words, letters, numbers)	8%
(Vitamin) supplements	8%
Socialization	7%
(Stimulating) toys	5%
Pleasant/structured environment	3%
Educational TV/videos	3%
Music	3%
Breastfeeding	2%
Limit amount of TV/computer	2%
Be a responsible adult (no smoking, drugs, alcohol)	1%
Listen to them	1%
Injury prevention	1%
Regular doctor's visits/follow doctor's recommendations	1%
Balance structured/unstructured play	1%
Other	2%
Don't know/no answer	28%

Table 3.2b: Top of Mind Responses of How Parents Can Best Support Early Brain Development, Ontario 2011 (responses from parents of children 0-6 years)

Note: *Response categories were not read to respondents.*

In total, 44% of respondents indicated that proper nutrition and a healthy diet was one of the most important ways parents could support their baby's or child's developing brain. Almost one quarter of parents surveyed mentioned that playing or interacting with their child (24%), or engaging them in stimulating activities (22%) were among the most important ways to support early brain development. Other common responses included reading/storytelling (20%), talking with their baby/child (18%), providing love, affection, support and encouragement (17%), ensuring their child got enough sleep (10%), providing exercise/physical activity (9%), and providing them with vitamin supplements (8%).

Very few respondents (3%) mentioned the use of educational TV or videos as one of the best ways parents can support early brain development. Only 2% of respondents identified the need to limit time in front of the TV or computer. More than a quarter of respondents (28%) did not provide any ideas about how parents could best support their baby's or child's brain development.

Women were more likely than men to believe that supplements or vitamins are important (11% vs. 4%), while dual parents were significantly more likely than single parents to identify stimulating or engaging activities as important (23% vs. 9%).

SURVEY QUESTION: Based on what you've heard or know about early brain development, please indicate whether you believe the following statements to be true or false.

Statements	True	False	Unsure
The use of cigarettes, alcohol and drugs during pregnancy can harm the brain of the developing fetus. (TRUE)	95%	2%	3%
Secure attachments and interactions with caring adults affect early brain development. (TRUE)	93%	2%	6%
Children's development is determined by both our genetics and the experiences and environments we are raised in. (TRUE)	92%	3%	5%
Early brain development impacts adult health, learning and behaviour. (TRUE)	92%	2%	6%
Excessive stress prenatally and/or in the first years of life, can affect a baby's brain development. (TRUE)	82%	5%	12%

Table 3.2c: Perceptions of Early Brain Development, Ontario 2011 (responses from parents of children 0-6 years)

The majority of parents believed that cigarettes, alcohol and drugs during pregnancy are harmful to healthy brain development (95%); that excessive stress during pregnancy and in the first years of life are harmful to healthy brain development (82%); that early brain development is affected by secure attachments with caring adults (93%); that brain development is impacted by genetics, early experiences and environments (92%); and that early brain development has lifelong consequences for one's health, learning and behaviour (92%).

Those with incomes of $40,000 and over were more likely to respond correctly to all questions, as compared to those with lower incomes. They were more likely to recognize the harmful affects of cigarettes, alcohol and drugs during pregnancy (97% vs. 86%), the positive impact of secure attachments with caring adults (96% vs. 81%) and of the combined impact of genetics, early experiences and environments on brain development (95% vs. 82%). They were also more likely to understand that early brain development impacts adult health, learning and behaviour (95% vs. 81%).

SURVEY QUESTION: Based on what you've heard or know about the relationship between play and early brain development, please indicate how strongly you agree or disagree with the following statements.

Statements	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree
Babies and young children learn by playing. (TRUE)	81%	16%	1%	0%
A greater emphasis on learning the basics (reading, writing, arithmetic) in preschool and kindergarten and less playtime will help to increase a young child's intelligence. (FALSE)	19%	21%	32%	24%
Products and toys that claim to increase infant intelligence or build baby's brains are usually grounded in strong scientific research. (FALSE)	14%	27%	32%	17%
Toys and play that use the five senses (e.g. sight, sound, touch, smell, taste) support babies' and children's development. (TRUE)	72%	26%	1%	<1%

Table 3.2d: Perceived Relationship Between Play and Early Brain Development, Ontario 2011 (responses from parents of children 0-6 years)

Virtually all respondents understood that babies and young children learn by playing (97%), and that toys and play which engage the five senses support babies' and children's development (97%).

Respondents were less certain about the two false statements. Two out of five respondents (40%) agreed that a greater emphasis on learning the basics opposed to playtime in preschool and kindergarten would help to increase a young child's intelligence, while 41% agreed with the claim that products and toys designed to build baby's brains are usually grounded in strong scientific research.

Parents who were older, married, had a higher income or higher education were more likely to respond correctly to certain statements. Those 35 or older were more likely that those 18-34 to disagree with the false statement that a greater emphasis on learning the basics will help increase intelligence (61% vs. 48%), and to disagree with the false claim about products increasing or building a baby's brain being grounded in strong scientific research (58% vs. 38%). Dual parents were more likely than those who are single to disagree with the false statement that at a greater emphasis on learning the basics will help increase intelligence (61% vs. 44%), and to disagree with the false claim about products increasing or building a baby's brain being backed up by science (58% vs. 35%). Parents with a university education were more likely than those with high school education to disagree with the false statement that a greater emphasis on learning the basics will help increase a young child's intelligence (61% vs. 48%), and to disagree with the false claim about products increasing or building a baby's brain being grounded in strong scientific research (58% vs. 31%). Those making $100,000 or more were more likely than those earning $60,000 or less to disagree with the false statement that a greater emphasis on learning will help increase intelligence (66% vs. 45%), and to disagree with the false claim that products increasing or building a baby's brain are grounded in strong scientific research (61% vs. 32%).

3.3 Parental Behaviours to Support Early Brain Development

SURVEY QUESTION: Which of the following activities would you consider to have a major impact, minor impact, or no real impact on the development of a child from birth to three years of age?

Activities	Major Impact	Minor Impact	No Impact
Playing with them	94%	4%	1%
Stimulating their 5 senses (e.g. sight, sound, touch, smell, taste)	93%	5%	-
Reading to them (sharing picture books and/or reading stories aloud)	93%	4%	1%
Feeding them a healthy diet	93%	4%	1%
Providing the opportunity for daily healthy physical activity	90%	7%	-
Encouraging and/or praising their efforts	89%	8%	-
Cuddling or holding them	89%	8%	1%
Establishing good sleep routines	89%	7%	1%
Providing them the opportunity to play with other children	88%	10%	-
Speaking to them in your home language	84%	10%	3%
Comforting them when they are upset	83%	14%	-
Establishing routines	82%	15%	-
Setting and enforcing rules	80%	15%	1%
Talking with them about feelings/emotions	77%	18%	1%
Singing to them	73%	23%	1%
Describing their surroundings	68%	27%	1%
Using flash cards	34%	48%	10%
Showing them any of the following tools designed for babies and toddlers: TV, DVDs, computer programs and/or Internet Website activities or games	32%	49%	12%

Table 3.3a: Perceived Impact of Parental Activities on Early Brain Development, Ontario 2011 (responses from parents of children 0-6 years)

The majority of respondents correctly identified that these activities have a major impact on early child development. More than nine out of ten parents believed that playing with their baby/child (94%), stimulating their five senses (93%), reading aloud to them (93%), and providing them with a healthy diet (93%) would have a major impact on their early development.

Women were more likely than men to provide correct responses. More women than men believed that reading aloud (96% vs. 86%), offering encouragement and praise (94% vs. 82%), cuddling or holding (93% vs. 82%), speaking in one's home language (88% vs. 79%), talking about feelings (86% vs. 63%), singing (78% vs. 67%), and describing one's surroundings (77% vs. 55%) are of major benefit to the development of a baby or young child.

Significantly more dual than single parents provided correct responses to some questions. More dual parents than single parents considered encouraging or praising a young child (95% vs. 77%), or cuddling/holding them (91% vs. 72%) to have a major impact on their early development.

Respondents earning $40,000 or more were more likely to have correct responses to some questions. Parents earning $40,000 or more were more likely to believe that setting and enforcing rules (97% vs. 85%), and talking about feelings (97% vs. 88%) would have a major impact on a child's early development.

Approximately one-third of parents incorrectly believed that the use of flash cards (34%) and media, computer programs, and/or on-line games (32%) would have a major impact on their baby's or child's development.

SURVEY QUESTION: At what age do you believe parents should begin the following activities with their baby or child in order to have a positive impact on the baby's/child's development?

Activities	From Birth	From 1 Year	From 2 Years	From 3 Years	School Age
Read to them (share picture books and/or read stories aloud)	77%	17%	3%	1%	0%
Talk to them	94%	3%	1%	0%	1%
Sing to them	89%	5%	1%	1%	0%
Cuddle, hold and/or tickle them	93%	3%	0%	1%	1%
Feed them a healthy diet	91%	5%	1%	1%	0%
Comfort them when they are upset	90%	4%	2%	1%	0%
Use flash cards	15%	33%	18%	10%	9%
Show them any of the following tools designed for babies and toddlers: TV, DVDs, computer programs and/or Internet Website activities or games	16%	28%	22%	11%	10%

Table 3.3b: Perceived Ideal Timing for Parental Activities to Positively Impact Early Brain Development, Ontario 2011 (responses from parents of children 0-6 years)

The majority of parents correctly believed that they should talk to their baby (94%), cuddle or hold them (93%), feed them a healthy diet (91%), comfort them when they are upset (90%), and sing to them (89%) right from birth. More than three-quarters of respondents correctly believed that parents should read to their baby/child right from birth (77%).

Women, older parents and dual parents were more likely to provide correct responses. Women were more likely than men to believe that parents should comfort their baby when upset (94% vs. 85%), and sing to them (92% vs. 84%) right from birth in order to have a positive impact on the child's development. Those aged 35 years or older were more likely than their younger counterparts to believe that talking to a child (97% vs. 89%), cuddling or holding them (96% vs. 87%), or feeding them a healthy diet (95% vs. 87%) should begin at birth. Dual parents were significantly more likely than single parents to believe that talking to one's baby (96% vs. 79%), cuddling or holding them (95% vs. 75%), and comforting them when they are upset (93% vs. 75%) should begin at birth.

Two-thirds of parents surveyed (66%) incorrectly believed that TV, DVDs, computer programs, Internet activities or flash cards should be introduced before three years of age in order to have a positive impact on early child development.

3.4 Information Needs

SURVEY QUESTION: What are the two or three things that you most want to know about how to support your baby's or child's development?

Top Things Parents Want to Know About How to Support their Baby's/Child's Development	% of Total Mentions
Diet/nutrition, breastfeeding/weaning	25%
Early childhood education/assist in their education and develop their intelligence	24%
Physical development/proper healthcare/vaccines	18%
Stimulate brain development/encourage speech, identify and reach developmental milestones	17%
Discipline/behaviour	9%
Socialization/psychological development	8%
Provide for proper child development/be a good/loving parent	7%
Age appropriate educational toys/activities	5%
Proper sleep habits	3%
What to avoid/dangerous activities, foods, behaviours	2%
Saving for future educational expenses/choosing schools	2%
What to do in the event of illness	2%
Mental health/learning disabilities	2%
Government programs/childcare support	1%
Toilet training	1%
Other	2%
Don't know/no answer	34%

Table 3.4a: Top of Mind Responses of Parents' Information Needs to Support Early Child Development, Ontario 2011 (responses from parents of children 0-6 years)

Note: *Response categories were not read to respondents.*

One-quarter of parents most wanted to know how healthy diets, nutrition and breastfeeding/weaning (25%) and how early childhood education (24%) would support their baby's or child's development. Other topics parents most wanted to find out about included their baby's or child's physical development and healthcare/vaccine needs (18%), as well as how to stimulate brain development and/or identify and support the achievement of developmental milestones/speech (17%).

Men were more likely than woman to want to know about early childhood education (37% vs. 16%), as were parents 35 years of age and older compared to their younger counterparts (29% vs. 18%).

SURVEY QUESTION: What are the two or three things that you most want to know about brain development in babies and young children?

Top Things Parents Want to Know About Brain Development in Babies and Young Children	% of Total Mentions
Diet/nutrition to support brain development	33%
Activities to support brain development	22%
Research recommendations to stimulate brain development/ dos and don'ts	14%
Educational resources, toys, books to support brain development and those to avoid (e.g. TV, Internet, cell phones)	8%
Developmental milestones/appropriate age to teach different material	6%
Foods to avoid/environmental dangers (e.g. medications, toxins, vaccines)	4%
Education (unspecified)	3%
How to stimulate fine motor skills/exercise	3%
Adequate sleep	1%
Speech development	1%
Health (unspecified)	1%
Role of parent/impact of parental relationship on early brain development	1%
Other	1%
Don't know/no answer	43%

Table 3.4b: Top of Mind Responses of Parents' Information Needs to Support Early Brain Development, Ontario 2011 (responses from parents of children 0-6 years)

Note: *Response categories were not read to respondents.*

Almost one-third of parents (33%) wanted information on how diet/nutrition could best support their baby's or child's brain development, while 22% want to know what activities would best support their baby's or child's brain development. Parents also most wanted to know about research recommendations on how to stimulate early brain development (14%).

Dual parents were more likely than their single counterparts to want to know about the best activities to support early brain development (23% vs. 10%).

3.5 Resource Needs and Usage

SURVEY QUESTION: Which information sources do you consult about your baby's/child's development and parenting?

Information Sources Parents Consult About their Baby's/ Child's Development and Parenting	% of Total Mentions
Internet/websites – general mention	55%
Healthcare professional/at a clinic or hospital	43%
Print material (e.g. books, magazines) – general mention	37%
Friends (with children)/parents/in-laws	32%
Teachers/school	4%
Today's Parent magazine	3%
Government information (federal, provincial, municipal)	3%
Babycenter.com	2%
Telehealth	2%
Television	1%
Other	2%
Don't know/prefer not to answer	14%

Table 3.5a: Top of Mind Response to Sources of Information for Early Child Development and Parenting, Ontario 2011 (response from parents of children 0-6 years)

Note: *Response categories were not read to respondents.*

More than one-half of parents (55%) said they most frequently consult the Internet/websites for information about their baby's or child's development and parenting. The next most popular information sources were healthcare professionals (43%), print materials such as books and magazines (37%), and those close to them (friends, parents, in-laws) (32%).

Women were more likely than men (49% vs. 34%) to consult a healthcare professional. University graduates were more likely than those with a lower level of education to turn to the Internet (69% vs. 46%), books or magazines (43% vs. 27%), or friends or family (35% vs. 29%). Respondents aged 35 years and older were more likely than their younger counterparts to consult print material (44% vs. 27%), as were those earning $100,000 or more compared to those earning less than $40,000 (45% vs. 21%).

SURVEY QUESTION: Please rate how likely you would be to use the following resources to get information about your baby's/child's development and parenting in the future.

Information Locations	Very likely	Somewhat likely	Somewhat unlikely	Very unlikely
Friends/colleagues	**46%**	**45%**	5%	2%
Internet/websites	**48%**	**42%**	6%	2%
Books	**51%**	**37%**	7%	3%
Parenting magazines	**38%**	**48%**	10%	3%
Parents/parents-in-law	**39%**	**40%**	14%	6%
Brochures/booklets/handouts	**25%**	**51%**	18%	5%
E-newsletters	15%	38%	28%	16%
Brief on-line courses (less than an hour)	10%	30%	**31%**	**25%**
You-Tube videos	8%	18%	**34%**	**37%**
Social media (e.g. Facebook, Twitter)	8%	18%	**34%**	**37%**
Telephone apps	5%	12%	**31%**	**47%**

Table 3.5b: Perceived Future Use of Resources on Early Child Development and Parenting, Ontario 2011 (responses from parents of children 0-6 years)

The majority of parents said they were most likely to talk to friends or colleagues (91%), search the Internet (90%), or refer to books (88%) to get information about their baby's or child's development and parenting. Also high on parents' list were parenting magazines (86%), parents and in-laws (79%), as well as brochures, booklets and handouts (76%).

Most parents felt they were unlikely to turn to telephone apps (78%), You-Tube videos (71%), social media (71%), and on-line courses (56%) and as future sources of information about their baby's or child's development or parenting.

Women were more likely than men to anticipate reading parenting magazines (91% vs. 77%) or subscribing to E-newsletters (60% vs. 43%).

Younger respondents were more likely than those 35 years of age or older to feel they would seek out early development or parenting information by taking a brief on-line course (48% vs. 34%) or using telephone apps (28% vs. 10%).

Respondents with incomes below $40,000 were significantly more likely than those with incomes of $100,000 or more to anticipate turning to You-Tube videos (40% vs. 22%), social media (36% vs. 19%), and telephone apps (30% vs. 11%).

Single parents were significantly more likely than dual parents to anticipate taking brief on-line courses (60% vs. 38%), watching You-Tube videos (45% vs. 25%), or using telephone apps (45% vs. 14%) to get information about early child development and parenting.

SURVEY QUESTION: If a resource was developed for parents about early brain development, what format would be most useful to you (choose top 2)?

Information Source	% of Total Mentions
Website	49%
Growth/development chart	28%
Brochure/booklet	25%
Sign to post on fridge	16%
Set of activity cards	14%
E-newsletters	12%
Brief on-line course (less than an hour)	11%
Calendar	9%
You-Tube video	4%
Telephone apps	3%
Social media postings (e.g. Facebook, Twitter)	2%
Other	2%

Table 3.5c: Preferred Format for Early Brain Development Resource, Ontario 2011 (responses from parents of children 0-6 years)

Almost half of all parents (49%) said that a website would be the most useful format for a resource focused on early brain development. Other popular formats included a growth or development chart (28%), and a brochure or booklet (25%).

Format options such as a brief on-line course, You-Tube video, telephone apps and social media postings were not as popular (selected by 11% or less).

Parents with incomes of $100,000 or more were more likely to prefer a website than those with lower incomes (61% vs. 45%).

Urban respondents were significantly more likely than rural dwellers to choose a brief on-line course. University graduates were more likely than those with a high school education or less to feel that E-newsletters would be the most useful format, while younger respondents (aged 18-34 years) were more likely to choose telephone apps as being a useful format. However, scores were still very low for each of these formats and sub-populations.

SURVEY QUESTION: Please rate how likely you would be to access information on your baby's/child's development and parenting if it was available from the following locations.

Information Locations	Very likely	Somewhat likely	Somewhat unlikely	Very unlikely
Healthcare provider (e.g. family doctor, paediatrician, developmental specialist, nurse, nurse practitioner)	60%	32%	6%	1%
Programs for parents (e.g. Ontario Early Years Centres)	30%	45%	18%	5%
Libraries	32%	40%	21%	6%
Public health units	23%	46%	22%	7%
Community or recreation centres	21%	45%	25%	7%
Prenatal or parenting classes	24%	39%	22%	12%
Childcare provider	25%	37%	23%	13%

Table 3.5d: Perceived Access of Information on Early Child Development and Parenting from Various Locations, Ontario 2011 (responses from parents of children 0-6 years)

In terms of where parents would prefer to access information on their baby's or child's development or parenting, the majority identified healthcare providers (60% very likely), followed by parenting programs and libraries.

Women were more likely than men to anticipate accessing information from a healthcare provider (95% vs. 87%), or program for parents (79% vs. 67%). Single parents were also more likely than dual parents to anticipate accessing information from a program for parents (87% vs. 73%).

SURVEY QUESTION: Please rate how often you see or hear the following media.

Mass Media	Always/Often	Rarely/Never
Internet	94%	4%
TV	82%	16%
Radio	72%	27%
Magazines	66%	32%
Newspaper	64%	34%
Social media (e.g. Facebook, Twitter)	57%	42%
You-Tube videos	42%	56%
Bus, subway or train ads	30%	68%
Movie theatre ads	24%	74%

Table 3.5e: Perceived Exposure to Mass Media, Ontario 2011 (responses from parents of children 0-6 years)

The Internet and television scored highest for media exposure, followed by radio, magazines, and newspapers.

Younger respondents had significantly higher exposure scores than those aged 35 years and older for social media (68% vs. 48%), You-Tube videos (49% vs. 37%), transit ads (37% vs. 25%) and movie theatre ads (33% vs. 17%).

Single parents were more likely than dual parents to frequently watch You-Tube videos (64% vs. 39%), see transit ads (60% vs. 26%), or see ads in movie theatres (53% vs. 21%).

Respondents in the highest income bracket ($100,000 or more) had higher exposure to magazines and radio than those in lower income brackets (less than $59,000), but were significantly less likely to use social media.

SECTION 4 | Comparisons with National Data and Research Findings

As the first Ontario specific survey to focus on parental knowledge concerning early brain development, this work provides a baseline of the knowledge, perceptions and resource needs of parents of young children (0-6). Without previous Ontario surveys for comparison, it is not possible to determine provincial changes in awareness over time. The findings from this survey show that parental awareness is high, with some areas of concern. This section of the report highlights areas of concern and/or divergence from national survey data, and discusses survey findings in the context of key research.

In 2002 Invest in Kids conducted a National Survey of Parents of Young Children, exploring the behaviour, knowledge and confidence of parents with young children. Some of the questions from the Invest in Kids survey are similar to questions asked by the Best Start Resource Centre in 2011. Direct comparisons of findings between the two surveys cannot be made for a number of reasons, including differences in populations, wording of questions, and response categories. However, there are relevant similarities and differences between the survey results.

For most survey questions Invest in Kids used a 10-point Likert scale, where 0 = completely disagree and 10 = completely agree. Their analysis of results was limited to scores of 0 and 10, in order to determine the percentage of Canadian parents who were completely certain that any given factual statement in the survey was true or false (Invest in Kids, 2002, p.33). A more complete picture of parents' knowledge may be gained from looking at the Invest in Kids survey report in more detail, to see where large proportions of remaining responses scored close to the correct response, and where a great deal of variation in responses reflected a higher degree of uncertainty.

4.1 Understanding Infant Attachment

Responding to infant cues

The majority of parents in the Best Start Resource Centre's 2011 survey (96%) understood that *long before a baby's first words appear, s/he can communicate a lot using facial expressions, sounds, cries, gestures and body language.* Invest in Kids used a similar knowledge-testing statement: *a baby can't communicate much until s/he is able to speak at least a few words* with similar results. Forty-one percent (41%) of national respondents completely disagreed with the false claim (scoring 0 on the Likert scale), with most other responses clustered near the low (correct) end of the scale (Invest in Kids, 2002, p.45).

In addition to recognizing that babies use non-verbal cues, cries and sounds to interact with those around them, and make their needs and feelings understood, parents need to develop an understanding of what those cues mean. Most parents in the Best Start Resource Centre Survey (81%)

correctly identified that for *infants and babies up to one year of age, their cries and signals indicate a genuine need for parental attention.* Results diverged from a related statement in the 2002 Invest in Kids survey, *infants as young as six months consciously know how to manipulate parents.* Only 18% of national respondents were certain the statement was false (scoring 0 on the Likert scale), and there was a relatively even distribution of responses across the 10-points of the Likert scale (Invest in Kids, 2002, p.48).

The Ontario findings suggest that parents do not agree with outdated ideas that even very young infants consciously act in specific ways to manipulate their parent's behaviour. In the first few months of life, a newborn's behaviour and cries are controlled by their lower brain centres, and are not deliberate. The planning and thought required for this type of deliberate interaction doesn't emerge until closer to 18 months (Invest in Kids, 2002, p.48; Zero to Three, 2007). The more parents are certain that an infant's early cries and cues indicate a genuine need for attention, the more likely they will tune in to those cues and respond in ways that benefit early infant development.

Infant attachment

Almost one-third (31%) of respondents to the Best Start Resource Centre Survey mistakenly believed that *picking up an infant every time s/he cries will spoil them.* Parents' uncertainty about whether frequently picking up, responding to, and comforting a crying infant is harmful or beneficial seems to reflect the outdated belief that too much parental attention would spoil a baby. Child development research clearly shows that the opposite is true. The more quickly, consistently and lovingly a parent and/or primary caregiver picks up and comforts a crying infant, the more secure the infant becomes in their relationship, and the less they cry (Invest in Kids, 2002, p48; Zero to Three, 2007). The development of this type of relationship right from birth helps strengthen the bond between parent and baby, resulting in a rewarding relationship that promotes healthy infant development (Invest in Kids, 2002, p45).

Parents understand the importance of infant attachment to early brain development. Ninety-three percent (93%) of respondents to the Best Start Resource Centre survey believed that *secure attachments and interactions with caring adults affect early brain development.* Similarly, over half (52%) of Invest in Kids survey respondents completely agreed (10 score on Likert scale) that *parents' emotional closeness with their baby can strongly influence that child's intellectual development,* with almost all remaining responses clustered around the agree end of the Likert scale (Invest in Kids, 2002, p.39).

Parents need information to reinforce their beliefs about the benefits of a secure attachment, and practical, research-based suggestions for how they can support the development of a secure attachment with their baby. Science has shown that a baby's or child's "environment of relationships" has a critical impact on the brain's architecture during the first months and years of life. In turn the effect of these influences on the developing brain lays the foundation for later developmental outcomes such as academic performance, interpersonal skills, and physical and mental health (National Scientific Council on the Developing Child, 2004b). Parent-child attachment research also tells us that social interaction is by far the most important form of stimulation a baby or toddler receives, not only for their sense of security and emotional well-being, but also for healthy brain development (Zero to Three, 2007).

4.2 Understanding Early Brain Development

Parents had a good knowledge of various aspects of early brain development.

Celebrating the opportunities presented by sensitive periods

Most Best Start Resource Centre's survey respondents (81%) correctly identified that *there are periods during development, such as from birth to age five, when the brain is more responsive to stimulation from the environment.* Respondent scores were also high (82% or higher), across a series of five knowledge-testing statements about key factors that can affect early brain development, both positively and negatively, as well as an understanding of the lifelong impacts of early brain development (see section 3.2).

Parents were aware of research evidence about early brain development, i.e. that external factors such as experiences and environment are extremely important to early brain development. While most of a newborn's brain cells develop prenatally, much of the connecting of neurons and strengthening of neural pathways occurs after birth. The way in which these brain cells connect and develop is influenced by the newborn's environment, and especially by the baby's relationship with his/her parents and primary caregivers.

Science has also revealed that the human brain remains plastic, continuing to develop important pathways and connections throughout life. Despite this plasticity, there are sensitive periods of development, particularly prenatally and in the first years of life, when brain development is most rapid. Parent resources should reinforce that these sensitive periods provide an excellent opportunity for parents and primary caregivers to build a strong and

healthy foundation for their baby's future. Responsive, nurturing relationships and safe, stimulating environments in the earliest years will help babies and young children thrive, and build a strong foundation for future wellbeing (Invest in Kids, 2002, p.43; National Scientific Council on the Developing Child, 2010b).

Responding to toxic stress

When parents respond to the signals of infants and young children, they establish a "serve and return" interaction. This type of relationship is essential for healthy brain development. Patterns of parenting that disrupt the normal "serve and return" interactions can harm the child's developing brain architecture and emerging skills. The development of a serve and return relationship right from birth helps strengthen the bond between parent and baby, resulting in a rewarding relationship that promotes healthy infant development (Invest in Kids, 2002, p45).

For survey statements focused on early brain development, parents scored lowest (although still high at 82%) and with the most uncertainty (12%) when asked if *excessive stress prenatally and/or in the first years of life can affect a baby's brain development*. Science shows that early exposure to circumstances that result in severe, uncontrollable, chronic fear and anxiety can have lifelong consequences on learning, behaviour, physical and mental health. "Toxic stress" of this kind may be experienced as a result of poverty, abuse, neglect, exposure to violence, and parental substance use or mental illness. If unaddressed, excessive, ongoing adversity prenatally and in the first years of life can disrupt the developing architecture of the brain, and negatively impact the chemical and psychological systems that help an individual adapt to stressful events (National Scientific Council on the Developing Child, 2005; National Scientific Council on the Developing Child, 2010a). It is crucial that parent support, early identification and intervention strategies are integrated with strategies to promote early brain development.

Understanding the links between social, emotional and intellectual development

Ontario parents' beliefs are aligned with a growing body of research on child development that reveals an infant's and child's emotional development is inextricably intertwined with their social, cognitive, and language skills. This Best Start Resource Centre survey found 95% of parents agreed that *social and emotional skills are as important for school readiness as intellectual skills*. Ontario results were much higher than those from a similar Invest in Kids 2002 survey statement, where only 8% of parents completely disagreed that *intellectual development is the most important part of a child's being ready for school* (score 0 on Likert scale). Remaining responses were relatively evenly distributed across the 10-point Likert scale, suggesting a high degree of parental uncertainty (Invest in Kids, 2002, p50).

Ontario parents were able to identify a range of correct ways to have a positive impact on the development of a baby or child, and the benefits of beginning many of those activities from birth (see Sections 3.2 and 3.3). The range of activities identified that supported physical, emotional, social and cognitive development, further demonstrates parents' understanding of the close connection amongst these domains. By and large, findings supported the notion that parental instincts and nurturing urges result in the kind of stimulation and range of experiences needed to support healthy brain development in the earliest months and years. High levels of parental awareness about various beneficial activities and their timing are encouraging, as parents and primary caregivers are responsible for providing their baby or young child with these experiences.

Mistaking early brain development for intellectual development

Despite the evidence that parents understand that children's early experiences affect the development of their brains, there are reasons for concern. Forty percent (40%) of Best Start Resource Centre survey respondents agreed that *a greater emphasis on learning the basics (reading, writing, arithmetic) in preschool and kindergarten and less playtime will help to increase a young child's intelligence.* Likewise, 41% of respondents agreed that *products and toys that claim to increase infant intelligence or build baby's brains are usually grounded in strong scientific research.* Approximately one-third of respondents incorrectly believed that the use of flash cards (34%), media, computer programs, and/or on-line games (32%) would have a major impact on a child's development from birth to three years of age. Two-thirds of respondents (66%) also believed these tools should be introduced before three years of age (see Sections 3.2 and 3.3).

Taken together, these findings suggest that parents may hold conflicting beliefs about early brain development. It is concerning that some parents may mistakenly equate early brain development with intellectual development, to the exclusion of a child's competencies in other domains. Parents need information that explains how closely connected cognitive, emotional, and social development are within the brain, and it is not realistic or effective to try and enhance the function of one without affecting the others. Focusing solely on "learning the basics" or "increasing intelligence", at the expense of play and the development of other domains, limits the opportunities for children to foster the competencies needed within and outside the classroom. Parents need to know that infants and toddlers do not require formal "teaching tools" such as flash cards or media applications to develop intelligence, and that there is no research to indicate that either is necessary or beneficial to build a baby's brain (Zero to Three, N.d.).

4.3 How Parents Can Support Early Brain Development

Babies are learning about and responding to the world around them right from birth. The availability and quality of their earliest relationships and experiences will determine the strengths or weaknesses of their brain's developing architecture, and influence their future learning, behavior and health (National Scientific Council on the Developing Child, 2004a; National Scientific Council on the Developing Child, 2007; National Scientific Council on the Developing Child, 2010b; Tremblay, Barr, Peters, & Boivin, 2008; Zero to Three, 2007). With this understanding, and some practical guidance, parents and caregivers can take advantage of early opportunities that most benefit early brain and early child development. One of the top information needs expressed by parents was for research-grounded recommendations on what to do and what not to do to support early brain development, how to identify and support the achievement of developmental milestones.

Emphasizing the value of play

Virtually all respondents in this Best Start Resource Centre survey agreed that *babies and young children learn by playing (97%), and that toys and play that use the five senses (e.g. sight, sound, touch, smell, taste) support babies' and children's development (98%).*

Parental beliefs are aligned with early child development research that confirms that play provides important opportunities for children to learn and to develop physical, social, emotional and cognitive skills. Children are born relationship-ready. Different types of play (locomotor, social, object, language, pretend) provide opportunities for a range of developmental benefits. A whole-child approach to play and playful learning is associated with improved literacy, mathematical performance, and social competencies that contribute to school success, in addition to a range of other abilities and attitudes that prepare children for life beyond the classroom (Tremblay et al., eds., 2008; Centre of Excellence for Early Childhood Development, 2010a; Zero to Three, 2007). Recent research on kindergarten readiness has also shown that skills that are developed through play (e.g. managing emotions, controlling one's impulses and behaviour, sharing, and language development) are key predictors of school success (Invest in Kids, 2002, p50).

Another key area of interest expressed by parents was how early childhood education could support their child's development and intelligence (see Section 3.4). Parents would benefit from knowing that research recommends child-centred play that includes a balance of free and structured playtime in happy, stimulating, engaging environments as the most beneficial approach to early learning

(Tremblay et al., eds., 2008; Centre of Excellence for Early Childhood Development, 2010a; Zero to Three, 2007). Key messages and/or research findings should be presented alongside suggestions for how parents can seek out and/or create positive early experiences for babies and toddlers in their preschool years. Parents can foster their young one's social and emotional development through opportunities to play and explore in various social settings, predictable routines, age-appropriate expectations for behavior and development, and most importantly, loving, engaging parental/caregiver interactions (Invest in Kids, 2002, p42; National Scientific Council on the Developing Child, 2004a). Key messages can focus on the value of play and emphasize the link between emotional, social, intellectual and physical development.

Building a language-rich environment from birth

The Best Start Resource Centre survey and the Invest in Kids survey showed high levels of parental knowledge about early speech and language development. Ninety-three percent (93%) of Ontario parents surveyed correctly identified that *the average one-year-old can understand many more words or phrases than they can say.* Invest in Kids found 30% of respondents completely agreed that *the average one-year old can say one or two words, but understands many more words and phrases* (score 10 on Likert scale), while most other responses were correctly clustered toward the high end of the Likert scale (Invest in Kids, 2002, p.46).

These positive responses are particularly encouraging, as research suggests a link between the number of words a baby hears in conversation with a parent in the first two years of life and their subsequent verbal intelligence (Zero to Three, 2007). Resources can build on parents' understanding that a baby's comprehension (receptive language) develops ahead of the baby's speech (expressive language), by reinforcing the value of talking, reading and singing to an infant right from birth. Immersing a baby in language even before s/he can speak may help their brain develop connections for hearing, language comprehension and acquisition, and interaction with the world around them (Invest in Kids, 2002, p46; Zero to Three, 2007). Even before birth, babies are capable of hearing the tone, pitch, and rhythm of their mother's voice. From their first days, babies tune in to the sounds of language, turning their head and focusing their eyes in the direction of a voice. Providing parents with simple every day examples, such as soothing a fussy baby through gentle voices and lullabies, engaging a baby in "conversation" by imitating and building on their coos and gurgles, talking to a baby about the world around them, or the pictures in their storybook, can help them create a language-rich environment for their baby right from birth. Parents should also know that in order for language exposure to be beneficial, research shows that it must be live (from a person in the same room as the baby), rather than from a television, DVD or computer program (Zero to Three, N.d.). Key messages for parents should emphasize that reading and storytelling are excellent ways to expose babies to live language from birth.

Providing a healthy diet

When asked about their information needs, Ontario parents were most interested in learning how healthy diets, nutrition, breastfeeding and weaning would support early child development (25%), and early brain development (32%) (see Section 3.4). Providing a proper diet was also the most common suggestion parents gave when asked about how they could best support early brain development (see Section 3.2).

Good nutrition is one of the best ways research has shown to promote healthy brain development (Zero to Three, N.d.). Brain development is most sensitive to a baby's nutrition between mid-gestation and two years of age (Zero to Three, N.d.). It is very important that pregnant mothers get all the nutrients they and their developing baby need, and to avoid nicotine, alcohol, drugs and other neurotoxins that may harm their developing baby (National Scientific Council on the Developing Child, 2006). Good nutrition is also important for the infant right from birth. Developing brains need iron, amino and fatty acids for healthy growth, with exclusive breastfeeding up to six months of age, providing just the right amounts of nutrients (Health Canada, 2004). The process of infant breastfeeding is also valuable for strengthening parent-baby attachment through close physical contact, comfort, eye contact and soothing sounds (Canadian Child Care Federation, Canadian Institute of Child Health, 2001). The need for a healthy diet continues as the infant grows. Adequate calories, protein, and other nutrients are essential for optimal physical and mental growth. Solid food can be introduced at 6 months, with breastfeeding continuing up to 2 years and beyond. Children who are malnourished have been found to have smaller brains, and often have lasting behavioural and cognitive deficits (Zero to Three, N.d.).

Parents want information about the types of food (including breastfeeding), and vitamins/supplements that promote healthy brain development. Parents need information about what the research shows is beneficial, and what is unnecessary, in terms of food, vitamins and supplements.

SECTION 5 | Recommendations for Program Planning

This section discusses the survey findings in terms of what they mean for Ontario parents and service providers, and provides recommendations for future programming and resource development. Local communities are encouraged to use the provincial findings presented in this report alongside information specific to their community.

This survey mainly addresses parental awareness, rather than parental behaviours and intentions. While parents, infants and children benefit from a broad range of services and supports related to early brain development, the following discussion focuses mainly on awareness strategies for parents, with some mention of other key supports.

5.1 Populations of Interest

Awareness strategies are most effective when they are designed for a specific population of interest (The Health Communication Unit, 1999). Carefully defining the population of interest will help in determining key messages, specific strategies, desired outcomes, etc. In general, this survey showed that Ontario parents of young children (ages 0-6 years) have high levels of awareness regarding basic early child development and early brain development messages, and about how they can support that development.

Families with Young Children

Awareness strategies are beneficial to all families with young children. In this survey, there was a trend towards lower levels of awareness in parents who were single, younger, had lower levels of education, and/or had lower incomes. These groups should therefore be considered potential populations of interest. However, children who are vulnerable, or at risk for poor health, learning and behaviour outcomes, are found across all social classes, and in all families, although the numbers are not evenly distributed between groups. While groups with lower socio-economic status have a greater percentage of vulnerable children, they have smaller numbers, simply because there are more children and families in the "middle class" (McCain, Mustard, Shanker, 2007; Willms, 2002). Ideally, strategies should be designed to reach families across all levels of socio-economic status. While awareness is important, strategies should also include key attributes such as social support, meeting basic needs of families etc.

The Invest in Kids survey similarly found that across the board, regardless of demographic sub-group, a significant proportion of parents lacked knowledge about child development and lacked confidence in their role as parents, and too few used positive parenting practices that promote healthy child and brain development (2002). Resources to support children's earliest experiences must be universal in order to reach the majority of parents.

Fathers

Most women today work outside the home, with fathers taking on more day-to-day parenting activities. Dual parents turn to one another frequently for support and advice on early child development and parenting. Findings across questions from this survey suggest that males have somewhat lower levels of awareness than women when it comes to early child and early brain development, and about how parents can support their children. Awareness strategies and key messages designed specifically for fathers may be helpful in bridging the gap.

Grandparents

Parents of young children often turn to their own parents or parents-in-law for advice on early child development and parenting. Many grandparents provide advice, emotional support and/or regular childcare. Service providers may want to consider awareness strategies designed to recognize the important influence grandparents have on how their grandchildren are raised, and to share the evidence-based information about nurturing child development.

Expectant Parents

The prenatal phase and first 2 years of live are pivotal in terms of developmental outcomes for children. Brain development begins prenatally, thus preconception and prenatal health is the best start parents can give their developing baby. Awareness strategies designed for expectant parents can make the link between how a healthy pregnancy supports a baby's brain development, and can prepare expectant parents for early parenting. Strategies should be designed to provide key information and supports to pregnant women, recognizing that a number of factors affect fetal brain development, including prenatal stress.

Under-reached Populations and Populations at Higher Risk

As a result of the limitations of this survey, some population groups may have been under-represented, or may have such low numbers that trends are not evident. Awareness levels, information needs and preferences may not be fully captured for lower educated, lower income parents, those with less computer skills, and/or those with a first language other than English.

Parents and children living in challenging life circumstances, as well as those who are most at risk of experiencing extreme chronic adversity, require early identification and targeted intervention strategies starting from the prenatal period. Intervention and program evaluation data, summarized by Harvard University's Center on the Developing Child (www.developingchild.harvard.edu) have begun to shed light on characteristics of the most beneficial programs and strategies to support young children at risk for poor life outcomes, although further work is still needed. Targeted interventions work best within a context of universal strategies, and require significant investments of time and resources. Parent support services are also beneficial.

Stakeholders should make use of existing effectiveness data, strive to involve vulnerable subpopulations in needs assessments, program and resource design, and evaluation efforts, and advocate for further investments to support those most in need.

5.2 Key Messages

Parents realize the early years are important. They understand that their relationship with their child and the experiences and environments their child is exposed to will have an impact on how they develop. Parents also know that the influences of these early experiences can have lifelong consequences, for better or for worse. Parents want to do what is best for their child, and want reliable information about early brain development.

Given the overall high level of awareness of most Ontario parents, key messages about early brain development need to be selected strategically. Unless local needs assessments highlight compelling evidence to the contrary, it is not recommended that future resources be directed toward campaigns, resources or workshops focused on:

- Generic messages about the importance of the early years, the critical role parents play, and the lifelong influence of a child's early experiences.
- Detailed explanations regarding the science of early brain development.

Results of this survey clearly showed that parents want simple, practical, research-based information (i.e. tips, activities, approaches, do's and don'ts), to help guide them to doing what's best for their baby or child, and their developing brain, at each stage of development. Specific areas parents were interested in include, but were not limited to:

- Basic, brief key messages about early brain development and what it means for infants, toddlers and their parents.
- Recommendations for nurturing developing brains with healthy nutrition (including breastfeeding).
- Suggestions for stimulating the five senses through daily experiences.
- Characteristics of safe, engaging environments for babies and young children.
- Ways to strengthen the infant-parent or primary caregiver relationship (i.e. infant attachment) and to promote its importance for healthy (brain) development.

Survey findings also indicated lower levels of awareness around some topics. It is recommended that future early brain development strategies reinforce and/or include the following key messages:

- You cannot spoil a baby with too much attention or love, but you can help nurture their developing brain.
- You do not need special tools or products to support early brain development.
- Stimulating activities do not always mean structured ones – children learn naturally during play.
- Suggestions for supporting emotional well being and social competence in the first months and years of life.
- The importance of pre-literacy for optimal brain development, and ways to create interactive, language-rich environments from birth.

All awareness strategies should include links to prenatal, early child development and parenting supports and services.

5.3 Tone

Parent resources about early brain development need to be positive and helpful. Previous surveys show that parents feel anxious about meeting the learning needs of their infants and young children. Caution must be used so as not to undermine parents' confidence, increase their guilt, or push them toward unproven, ill-advised efforts to make their baby smarter.

While there is no single formula to ensure a happy, healthy childhood, there are approaches with proven benefits. Parents already know that the following factors are important to early brain development: a loving relationship, providing comfort, security, stimulation, and engaging experiences. Research-based messages that reinforce how sound their instincts are may go a long way in building confidence and reassuring parents they can provide all that their young baby or child needs to thrive.

5.4 Framing

Service providers should consider framing messages about early brain development within the context of overall child development. The early years have a long term impact on health, with consequences continuing into adult life. Children's early experiences affect the development of their brains, which in turn impacts their development across all other domains (i.e. physical, emotional, social and cognitive). The two issues of early brain development and early child development are inextricably intertwined. A focus on just early brain development is not only artificial, and may also run the risk of parents mistakenly equating brain development with cognitive development, or intelligence, to the exclusion of children's other core competencies.

5.5 Consistency

Parents today have access to an overwhelming amount of information, often conflicting, about early child development, parenting, and the latest in early brain development. In some cases, advances in neuroscience have been misunderstood and/or misapplied to early or human brain development, particularly from a profit-driven industry devoted to making babies smarter. Knowing what information to trust, and where to find it, poses a real challenge.

While a unified approach to resource distribution would undoubtedly help, there is also a need for consistency and clarity across key messages and awareness strategies for various sub-populations. The underlying research, principles, and recommended parenting approaches for each stage of development should form a coherent, consistent message for parents. Caution and consistency are particularly important when providing information about brain research about early or human brain development. Many good, strong recommendations for early child development and positive parenting practices are based in social science research, which makes as strong a case as the "hard" sciences.

5.6 Strategies

The promotion of healthy brain and child development requires multiple strategies that meet the diverse needs of all children and families. Likewise, multiple awareness raising strategies are required to meet the information needs and information seeking behaviours of specific populations. Messages and channels appropriate for reaching large mainstream parenting populations with relatively high levels of awareness may not be the same as those selected for sub-populations with lower levels of knowledge or those living in higher risk conditions. In general, those who are most likely to seek out information and resources are those who need it least. Resources and strategies need to be specifically designed and developed to reach those who could most benefit. Strategies should complement and coordinate with existing prenatal and child health programs, policies and resources.

Resource Formats and Distribution Channels

Most of the parents sampled in this survey said they would prefer to get information on early brain development from a Website, a growth or development chart, or a brochure or booklet. They would be most likely to access this information from healthcare providers, community programs for parents, and libraries. In terms of mass media, the majority of respondents are most likely to see or hear messages over the Internet, television or radio and to a lesser extent magazines and newspapers.

Web-based information should therefore be considered a resource priority. Promotional strategies will also need to be considered so that parents know where they can find credible on-line information.

Strategies involving healthcare providers should also be a priority, as they are favoured as credible source of information on early brain development. Healthcare providers can be encouraged to talk to expectant and new parents about early brain and early child development. Service providers and interest groups are encouraged to think strategically about how to get informative resources (e.g. website promotion, development charts, brochures or booklets) into clinical settings for distribution. For additional information healthcare providers can also access On Track – ***Supporting Healthy Child Development and Early Identification in the Early Years: A Reference Guide for Professionals in Ontario*** at www.beststart.org/OnTrack_English.

Overall, survey respondents gave social media (e.g. facebook, twitter) and You-Tube videos low exposure ratings and less favourable scores as a resource format and source of information on early brain development. However, results for sub-populations indicate that these approaches may appeal to younger, lower income, and single parents. Further investigation would be helpful to assess their suitability for targeted awareness strategies.

To support strategies directed to parents, it is important to consider tools and training to assist service providers in promoting healthy child development and early brain development.

Some of these strategies can be costly in terms of design and distribution. Careful thought will be needed for ways to stay on budget, and to have messages stand out from all the other information aimed at parents of young children.

Make Use of Existing Resources

There are numerous high-quality early child development and parenting resources at the provincial and local levels. Many of these resources already contain practical, simple, research-based information for parents on how best to nurture their child's emotional, social, cognitive and physical development at various ages and stages. Other resources could be modified to address specific population's information needs related to early brain development (e.g. incorporating messages into materials about breastfeeding and/or food for children). Community partners are encouraged to make use of what's already in place through revisions and/or systematic and coherent distribution strategies in multiple settings as a low-cost way to reach families.

Beyond the Role of Parents

It is clear that the relationship established between a baby and parent(s) has a critical impact on the early experiences that will shape that child's future well-being. Yet the provision of relationships and conditions needed to promote optimal brain and early child development is not solely a parental or familial responsibility. It is also a social responsibility. This is particularly true given how many parents work, and the central role that childcare providers play in early child development. Strategies that raise awareness about the social and political factors that impact on family and child well-being, and that generate support for progressive social policies, would go a long way to establishing the best foundation for all children.

Working Together Provincially

Local partnerships, leadership, and community expertise are essential to successfully build an integrated network of prenatal, early child development and parenting resources that support early brain development. Communities need support in their efforts, including continued provincial initiatives. Where possible, consideration should be given to the benefits of province-wide awareness strategies in terms of cost efficiencies, reduced duplication, greater impact, and improved opportunities for evaluation. Provincial coordination for the systematic distribution of new and existing resources could also be considered, including strengthened partnerships with healthcare providers. A provincially coordinated body might also be beneficial in reviewing and/or developing resources to ensure consistency of key messages and underlying principles, and compatibility with relevant provincial policies across and within ministries. Ontario can build on its successes and commitment to young children through increased multi-sector efforts at the provincial and community level.

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