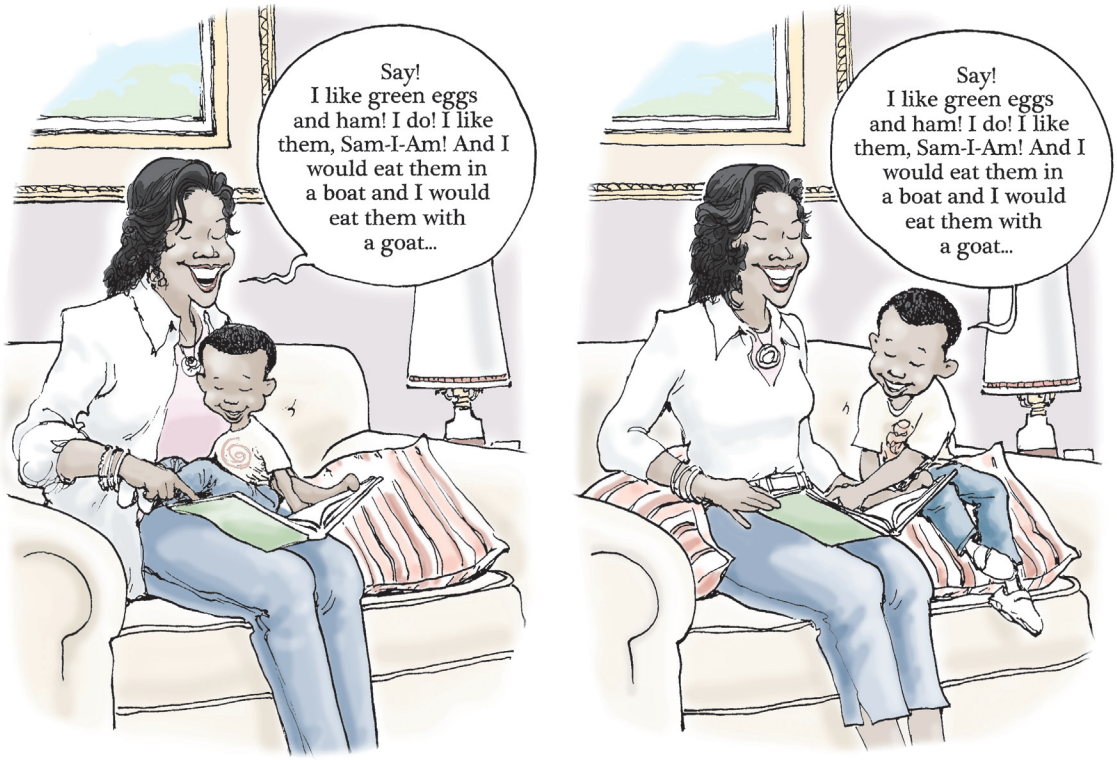


Parents build the foundation for the children's development.

A child's earliest years are the foundation for the rest of his life – not just because they come first, but because his development is more flexible during this period than it will be in the future. This flexibility, or "plasticity," is due in large part to the dramatic pace of brain development during this period. At birth, the wiring of the brain is incomplete; over the next few years, the brain continues to create the connections that are the basis of thinking and learning. The strength and efficiency of these connections are strongly influenced by a child's earliest experiences.[1]

Parents are by far the most prominent influences on a child during the first three years, and they have an enormous amount of responsibility for their children's development. In addition to needing a healthy and safe environment, a child relies on his parents to teach him language skills, coach him in appropriate behaviors, and serve as models for his future relationships.[2] Research consistently shows that a child's achievement, behavior, and adjustment are related to the quality of parenting he received in his first years. In some cases, parenting has direct and measurable effects on the brain: several studies have linked low-quality parenting, harsh discipline, and stressful home environments to abnormal patterns of brain activity.[3,4]

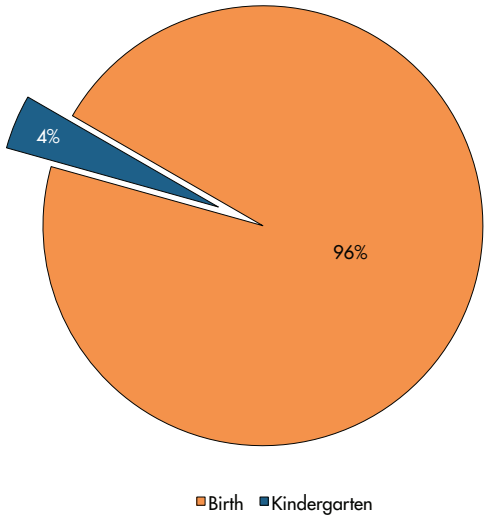
Quality caregiving requires an understanding of how children develop.

Parents want what is best for their children, but not all parents understand the importance of their children's first few years of life. Parenting style is strongly affected by parents' knowledge and beliefs.[5] Parents who are familiar with developmental stages and milestones judge their children's progress accurately, have realistic expectations, and provide stimulating home environments. Parents without such knowledge often expect too much from their children, which can lead to impatience, anger and inappropriate discipline. They may also expect too little: not knowing what their children are capable of at a given age, less-informed parents are unlikely to challenge them to reach their potential. Not surprisingly, then, children of more knowledgeable parents have better cognitive and behavioral outcomes.[6-8]

How well do parents in Shelby County understand the processes of early childhood development? To address this question, we use the results of the 2009 Early Childhood Development Public Opinion Poll, sponsored by The Urban Child Institute. 600 Shelby County residents were polled by telephone on a number of issues related to child development and early education. In this chapter, we examine how respondents with children answered a subset of fifteen questions relevant to parenting and early brain development.

FIGURE 1: When does learning start

Source: Early Childhood Development Public Opinion Poll, 2009.



Learning begins at birth.

Long before a baby begins crawling, walking, and talking, he is developing other skills that are less noticeable but just as important. A great deal of language learning, for instance, happens in the first year of life. Before a baby comprehends speech, he learns to translate it from a steady stream of sound into meaningful patterns and individual words. Memory and attention skills are also developing during these early months.[9]

96 percent of Shelby County parents understand that learning begins at birth, not when a child begins school (Figure 1).

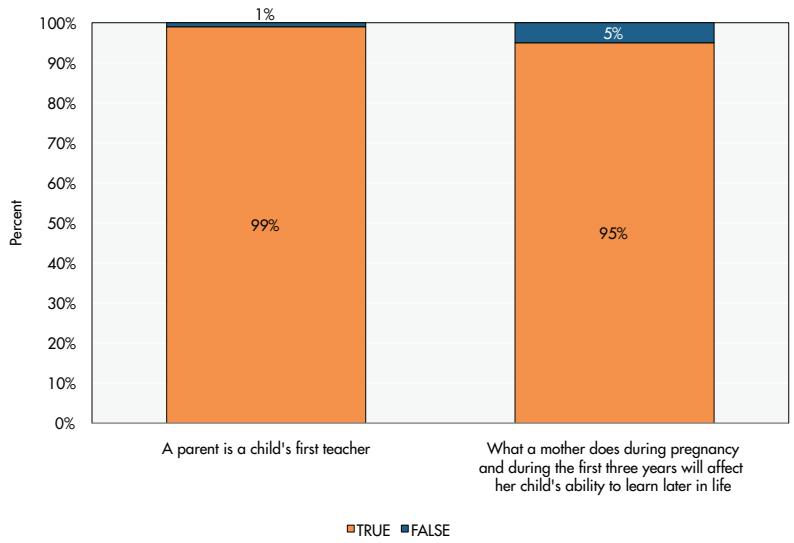


FIGURE 2:
Do parents understand the importance of early parenting for their children's learning

Source:
Early Childhood Development Public Opinion Poll, 2009.

Parents play an essential role in how children learn.

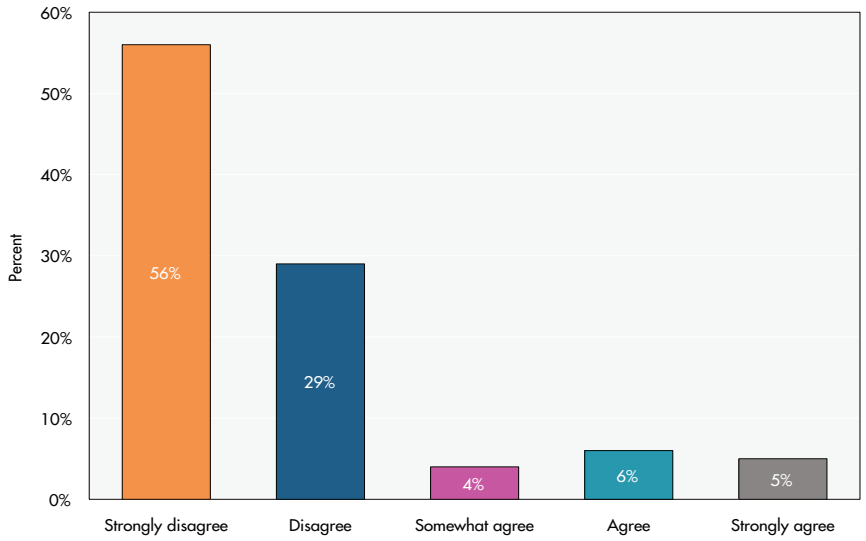
Parents play an important role in children's mastery of early cognitive and social skills; these skills, in turn, are strongly related to later academic and behavioral outcomes. Teaching does not begin with helping a child learn his first words; it starts at birth. Even before a baby can understand what his parents are saying, he is learning important lessons from their tone of voice, their facial expressions, and their body language. Sensitive parenting, positive feedback, and emotional support are necessary ingredients for effective learning, from the earliest perceptual skills to later problem-solving abilities.[10]

Even before a child is born, his parents and home environment are shaping his future abilities. The nine months in the womb are a critical period for brain development, and prenatal exposure to substances such as nicotine, marijuana, and alcohol has been linked to several negative outcomes for children, including attention disorders, behavior problems, learning deficits, and memory impairment.[11] Using electroencephalogram (EEG) recordings, scientists have identified differences in language-related brain activity between newborns whose mothers smoked and those whose mothers did not.[12]

Almost all respondents with children agree that a child's parents are his first teachers. 95 percent understand that what a mother does during pregnancy and the first three years influences her child's ability to learn later in life (Figure 2).

FIGURE 3:
How did parents react to the statement, "A child's ability to learn is set from birth, so the parents' interaction does not affect brain development"

Source:
Early Childhood Development Public Opinion Poll, 2009.



Parent-child interactions affect brain development.

The early cognitive skills that support learning depend on healthy brain development. When a child is born, her brain already has all of the neurons (nerve cells) it will ever have.[13] In order to function, however, these neurons must make connections – called synapses – that allow them to send, receive, and process information. Throughout the first years of life the brain creates an excess of synapses, then, around age three, begins to prune away those that are rarely or never used.

A child's early experiences play a role in determining which of these connections will survive and which will be eliminated.[14] When a baby hears her mother's voice or watches her facial expressions, synapses in corresponding brain areas become stronger and better organized. Stimulating, developmentally appropriate experiences – from language and music to colors and shapes – promote strong synapses and efficient networks.

Most Shelby County parents recognize the importance of the parent-child relationship for early brain development: only 15 percent agreed with the statement that the interactions between a child and her parents do not affect brain development (Figure 3).

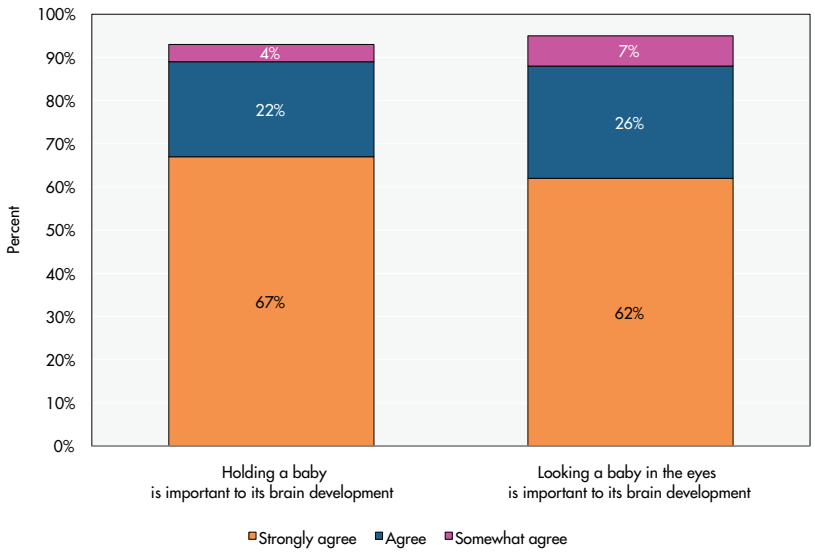


FIGURE 4:
To what degree do parents agree that positive interactions such as holding a baby and making eye contact foster brain development

Source:
Early Childhood Development Public Opinion Poll, 2009.

Nurturing behaviors promote brain development.

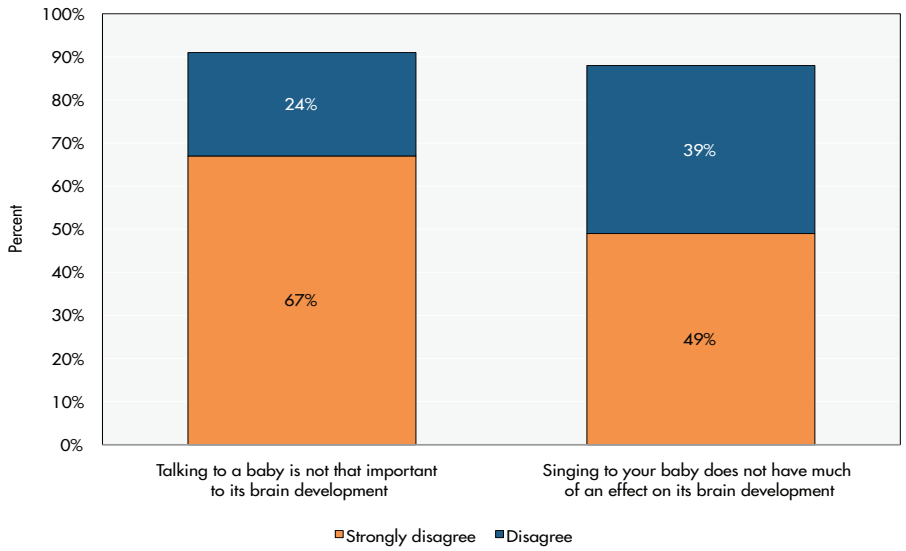
A baby needs a secure emotional attachment to her parents and caregivers. Activities that strengthen this bond also strengthen connections in emotion-related areas of the brain.[15] Physical contact is critical for the formation of a strong attachment.[16] Touching and holding promote brain development, cognitive development, and physical health.[17]

Infants obtain a great deal of information by observing faces. From birth, they are sensitive to eye contact and have the ability to follow the gaze of another person. The brain's social networks – the regions involved in processing faces and body language – are strengthened by nurturing and affectionate behaviors like physical touch and eye contact.[18,19]

Parents in Shelby County understand the importance of nurturing interactions like these. 93 percent of parents agreed that holding a baby is important in promoting brain development, and 95 percent said the same about looking into a baby's eyes (Figure 4).

FIGURE 5:
How strongly do parents disagree that talking and singing to a baby does not affect brain development

Source:
Early Childhood Development Public Opinion Poll, 2009.



Talking and singing to a baby stimulates language-related areas of her brain.

Talking is one of the most effective ways that parents can promote brain development. The language a baby hears during the first months of life helps neural circuits related to speech perception become more specialized and efficient. The speech she overhears is one source of input, but she learns more when her parents address her directly. Eye contact and facial cues sharpen her focus and make learning effective.[20,21]

When talking to their infants, parents tend to adopt a simplified, melodic delivery that shares many qualities with singing. Like singing, this style (sometimes called motherese or parentese) is characterized by repetition, raised pitch, and short utterances. The simplified and exaggerated language of singing and parentese is naturally appealing to babies and makes learning easier.[22,23]

Roughly 9 out of 10 Shelby County parents understand the importance of language for brain development. 91 percent disagreed or strongly disagreed with the statement that talking to a baby is not important to brain development, and 88 percent disagreed or strongly disagreed with the corresponding statement about singing (Figure 5).

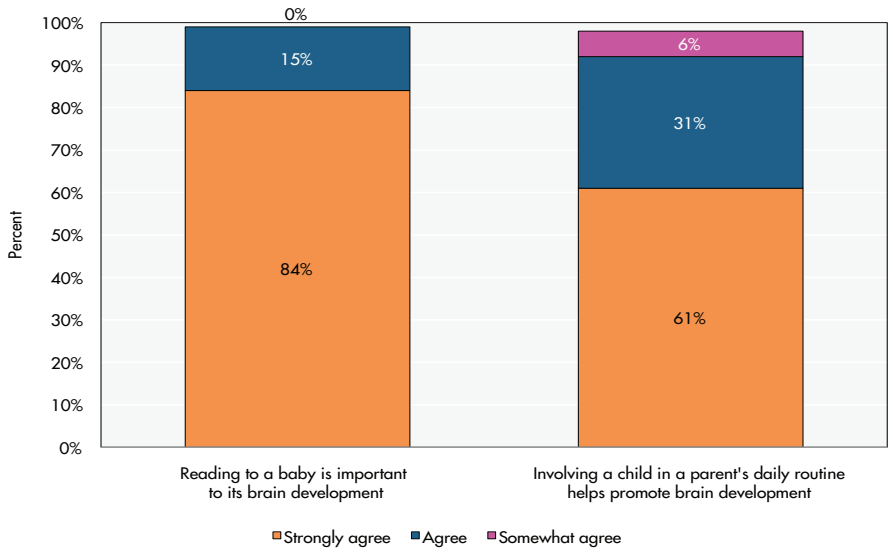


FIGURE 6:
What percent of parents agree that reading to children and involving them in daily routines are important for brain development

Source:
Early Childhood Development Public Opinion Poll, 2009.

Brain development can be fostered by a variety of activities.

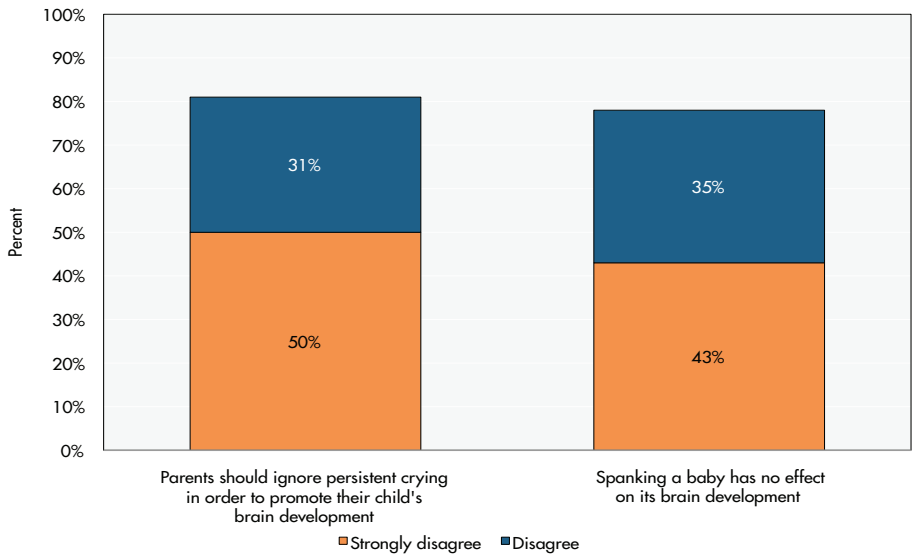
Reading to a child, even in infancy, promotes language development. Sharing a book with a baby exposes her to a larger and more diverse vocabulary than she might otherwise hear, which increases the efficiency of language-related areas of the brain.[24,25] Studies show that reading to babies as young as eight months improves their language abilities in the second year, and benefits for even younger babies are likely.[26]

Less formal activities can also promote brain development. Creative use of daily routines can ensure that children learn a diverse vocabulary and receive a variety of stimulating experiences. A trip to the supermarket, for example, can introduce an infant to new shapes, colors, and smells. For toddlers, it can be an opportunity to learn new words or practice counting. Routines also give children a sense of stability and structure that is associated with better academic and behavioral outcomes.[27]

Poll results show that almost all parents (99 percent) feel that reading to a baby is important. Nearly as many (98 percent) recognize that involving children in parents' daily routines is important for brain development (Figure 6).

FIGURE 7:
Do parents understand that parenting strategies affect children's brain development

Source:
Early Childhood Development Public Opinion Poll, 2009.



Infants can't be spoiled.

Persistent crying can be frustrating for parents, and difficulty in soothing their child can cause parents to feel guilty or inadequate. In extreme cases, it can lower the quality of the parent-child relationship and may even lead to maltreatment and abuse.[28] Because crying can have many causes, there is no one-size-fits-all solution. However, research suggests that infants cannot be "spoiled" and that parents should respond to a baby's distress signals. Compared to babies whose parents ignore or react negatively to crying, those whose parents are responsive and soothing eventually display less crying and fussing, an improved ability to sooth themselves, and more sociability and curiosity.[29]

In the U.S., most parents consider spanking an appropriate form of discipline for preschoolers and slightly older children.[30] A substantial minority, however, report that they spank their infants and toddlers;[31] research on child development strongly discourages this practice. Spanking children under two years old, in addition to being ineffective and dangerous, can disrupt brain networks related to emotional attachment and stress management.[32-34]

Most Shelby County parents believe that parents should not ignore a baby's cries. 81 percent of respondents disagree or strongly disagree with the claim that ignoring persistent crying promotes a baby's brain development. Parents also understand the potential harm of spanking very young children. 78 percent of participants disagree or strongly disagree that spanking a baby has no effect on brain development (Figure 7).

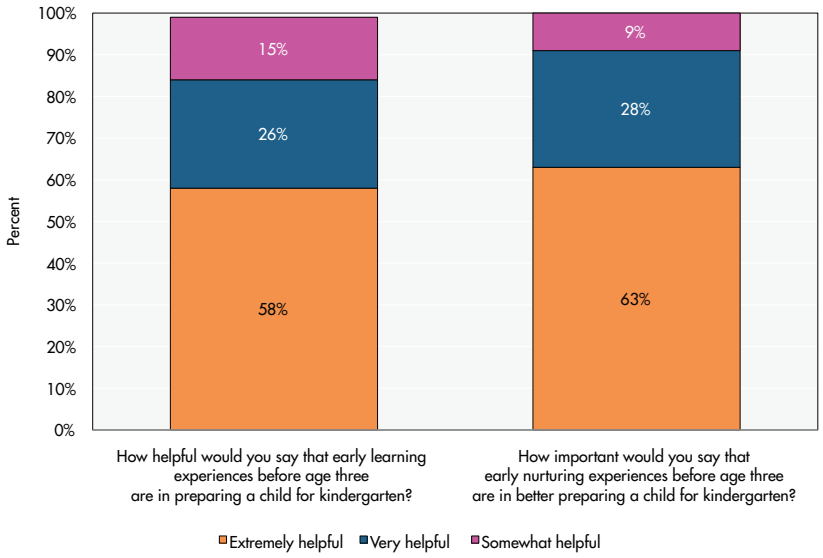


FIGURE 8:
Do parents believe that positive early experiences help prepare children for kindergarten

Source:
Early Childhood Development Public Opinion Poll, 2009.

Positive experiences during the first three years help prepare a child for school.

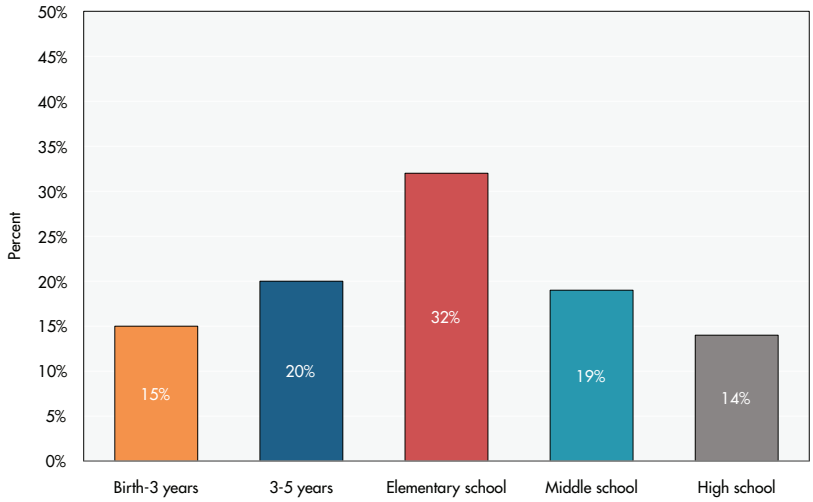
Entering kindergarten is a critical milestone in a child's development. Schools expect children to arrive ready to learn in a formal setting, and those who are unprepared often find it difficult to catch up later. Making a smooth transition to kindergarten requires cognitive, emotional, behavioral, and social skills that have been developing since infancy. A child's skill level is affected by early learning experiences, such as the language input he has received at home. Long before school begins, children whose parents use diverse and complex language get a head start in vocabulary and pre-reading skills.[35,36]

Early nurturing experiences also contribute to school readiness. Children of sensitive, responsive parents have been found to achieve language milestones earlier than other children[37] and to have better language comprehension and verbal abilities.[38] Additionally, nurturing lays the groundwork for healthy emotional and social development in early childhood and beyond.[39] Emotional adjustment and social skills are essential components of school readiness.[40]

Across Shelby County, parents recognize that early experiences matter for school readiness. Almost all respondents with children consider learning experiences and nurturing experiences before age three to be helpful in preparing children for kindergarten (Figure 8).

FIGURE 9:
If we want to improve the quality of learning for children in Shelby County, among which age should we invest our public dollars

Source:
Early Childhood Development Public Opinion Poll, 2009.



Investing in children early provides the biggest returns.

Investments targeting the first three years not only provide the highest rate of return, but also reduce the cost of later interventions. For example, programs targeting children under three can decrease grade retention, increase graduation rates, and reduce the need for special education services, resulting in lower costs to the education system.[41,42]

The poll results presented in this chapter indicate that Shelby County parents realize the importance of children's early experiences – especially in the first three years – for brain development, school readiness, and future achievement. But are they ready to support public investments in this age group? We asked respondents to choose the age range in which Shelby County should invest in order to improve the quality of learning.

Given that parents repeatedly affirmed the importance of children's first three years, it is somewhat unexpected that only 15 percent believe that this age range is the best target for investment. More parents chose the preschool period (age 3-5), and twice as many chose the elementary school years (Figure 9).

What can we learn from the 2009 Early Childhood Development Public Opinion Poll results?

Parents in Shelby County understand the importance of the first three years for children's brain development and well-being. However, they show little support for public investments to improve the quality of learning experiences during this period. There are several possible reasons for this. For instance, some parents may feel that children's first years are exclusively a family matter. Americans have traditionally held that the government's role in matters concerning children and families should be limited.[43]

Another possible explanation involves the poll itself. Poll respondents may have answered differently if the question had been more specific. Compared to government funding for preschool and elementary school, the idea of public investments in children's first three years may seem unfamiliar. Without specific policy examples, parents may have felt that improving preschool or elementary school quality was the most responsible use of resources.

The results of the 2009 poll suggest that although Shelby County parents understand the importance of a child's earliest experiences, they are not yet convinced that early childhood development is a public concern. In reality, the first three years of life – when the brain is still "under construction" – are the most promising opportunity for making meaningful changes in the lives of our community's children. The cognitive, social, and emotional lessons they learn during these years have the potential to last a lifetime.

Public awareness of the importance of brain development is a good start. The task that remains is to convert awareness into action. Our community needs to champion early brain development with policies that support positive parenting and ensure that all children have a fair start in life. Parents, schools, neighborhoods, businesses, and government can each play a role in providing Shelby County's children with early experiences that promote healthy development, academic achievement, and future success.

References

1. Couperus JW, Nelson CA. Early brain development and plasticity. In McCartney K, Phillips D, eds. Blackwell *Handbook of Early Childhood Development*. Malden, MA: Blackwell Publishing; 2008:85-105.

2. Kochanska G. Emotional development in children with different attachment histories: The first three years. *Child Development*. 2001;72(2):474-490.

3. Dawson G, Ashman SB, Panagiotides H, et al. Preschool outcomes of children of depressed mothers: Role of maternal behavior, contextual risk, and children's brain activity. *Child Development*. 2003;74(4):1158-1175.

4. Hane AA, Fox NA. Ordinary variations in maternal caregiving influence human infants' stress reactivity. *Psychological Science*. 2006;17(6):550-556.

5. Reich S. What do mothers know? Maternal knowledge of child development. *Infant Mental Health Journal*. 2005;26(2):143-156.

6. Benasich AA, Brooks-Gunn J. Maternal attitudes and knowledge of child-rearing: associations with family and child outcomes. *Child Development*. 1996;67(3):1186-1205.

7. Damast AM, Tamis-LeMonda CS, Bornstein MH. Mother-child play: Sequential interactions and the relation between maternal beliefs and behaviors. *Child Development*. 1996;67(4):1752-1766.

8. Miller CL, Miceli PJ, Whitman TL, et al. Cognitive readiness to parent and intellectual-emotional development in children of adolescent mothers. *Developmental Psychology*. 1996;32(3):533-541.

9. Dehaene-Lambertz G, Hertz-Panner L, Dubois J, et al. How does early brain organization promote language acquisition in humans? *European Review*. 2008;16(4):399-411.

10. Fagot BI, Gauvain M. Mother-child problem solving: continuity through the early childhood years. *Developmental Psychology*. 1997;33(3):480-488.

11. Huizink AC, Mulder EJH. Maternal smoking, drinking or cannabis use during pregnancy and neurobehavioral and cognitive functioning in human offspring. *Neuroscience and Biobehavioral Reviews*. 2006;30:24–41.

12. Key APF, Ferguson M, Molfese DL, et al. Smoking during pregnancy affects speech-processing ability in newborn infants. *Environmental Health Perspectives*. 2007;115(4):623-629.

13. Nowakowski RS. Stable neuron numbers from cradle to grave. *Proceedings of the National Academy of Sciences of the United States of America*. 2006;103(33):12219-12220.

14. Johnston MV, Ishida A, Ishida WN, et al. Plasticity and injury in the developing brain. *Brain & Development*. 2009;31:1-10.

15. Schore AN. Effects of a secure attachment relationship on right brain development, affect regulation, and infant mental health. *Infant Mental Health Journal*. 2001;22(1-2):7-66.

16. Anisfeld E, Casper V, Nozyce M, et al. Does infant carrying promote attachment? An experimental study of the effects of increased physical contact on the development of attachment. *Child Development*. 1990;61(5):1617-1627.

17. Diamond A, Amso D. Contributions of neuroscience to our understanding of cognitive development. *Current Directions in Psychological Science*. 2008;17(2):136-141.

18. Farroni T, Massaccesi S, Menon E, et al. Direct gaze modulates face recognition in young infants. *Cognition*. 2007;102:396-404.

19. Senju A, Johnson MH. The eye contact effect: mechanisms and development. *Trends in Cognitive Sciences*. 2009;13(3):127-134.

20. Mills D, Conboy BT. Early communicative development and the social brain. In De Haan, M Gunnar MR, eds. *Handbook of Developmental Social Neuroscience*. New York, NY: Guilford Press; 2009:175-206.

21. Werker JF, Yeung HH. Infant speech perception bootstraps word learning. *Trends in Cognitive Sciences*. 2005;9(11):519-527.

22. Moore DS, Spence MJ, Katz GS. Six-month-olds' categorization of natural infant-directed utterances. *Developmental Psychology*. 1997;33(6):980-989.

23. Soderstrom M. Beyond babytalk: Re-evaluating the nature and content of speech input to preverbal infants. *Developmental Review*. 2007;27:501-532.

24. Booth JR, Burman DD. Development and disorders of neurocognitive systems for oral language and reading. *Learning Disability Quarterly*. 2001;24(3):205-215.

25. Mills DL, Plunkett K, Prat C, et al. Watching the infant brain learn words: effects of vocabulary size and experience. *Cognitive Development*. 2005;20:19-31.

26. Karrass J, Braungart-Rieker JM. Effects of shared parent-infant book reading on early language acquisition. *Applied Developmental Psychology*. 2005;26:133-148.

27. Koblinsky SA, Kuvalanka KA, Randolph SM. Social skills and behavior problems of urban, African-American preschoolers: Role of parenting practices, family conflict, and maternal depression. *American Journal of Orthopsychiatry*. 2006;76(4):554-563.

28. Reijneveld SA, Brugman E, Hirasing RA. Excessive infant crying: the impact of varying definitions. *Pediatrics*. 2001;108:893-897.

29. Propper C, Moore GA. The influence of parenting on infant emotionality: A multi-level psychobiological perspective. *Developmental Review*. 2006;26:427-460.

30. Gershoff ET. Corporal punishment by parents and associated child behaviors and experiences: A meta-analytic and theoretical review. *Psychological Bulletin*. 2002;128(4):539-579.

31. Slade EP, Wissow LS. Spanking in early childhood and later behavior problems: A prospective study of infants and young toddlers. *Pediatrics*. 2004;113:1321-1330.

32. Amercian Academy of Pediatrics. Guidance for effective discipline. *Pediatrics*. 1998;101(4):723-728.

33. Bugental DB, Martorell GA, Barraza V. The hormonal costs of subtle forms of infant maltreatment. *Hormones and Behavior*. 2003;43:237-244.

34. Schore AN. Effects of a secure attachment relationship on right brain development, affect regulation, and infant mental health. *Infant Mental Health Journal*. 2001;22(1-2):7-66.

35. Hart B, Risley TR. *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Paul H. Brookes Publishing Co; 1995.

36. Pan BA, Rowe ML, Singer JD, et al. Maternal correlates of growth in toddler vocabulary production in low-income families. *Child Development*. 2005;76(4):763-782.

37. Nicely P, Tamis-LeMonda CS, Bornstein MH. Mothers' attuned responses to infant affect expressivity promote earlier achievement of language milestones. *Infant Behavior and Development*. 1999:22(4):557-568.

38. Pungello EP, Iruka IU, Dotterer AM, et al. The effects of socioeconomic status, race, and parenting on language development in early childhood. *Developmental Psychology*. 2009;45(2):544-557.

39. Bales KL, Carter CS. Neuroendocrine mechanisms of social bonds and child-parent attachment, from the child's perspective. In De Haan, M, Gunnar MR, eds. *Handbook of Developmental Social Neuroscience*. New York, NY: Guilford Press; 2009:246-264.

40. Blair C. School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. *American Psychologist*. 2002;57(2):111-127.

41. Heckman JJ. The economics, technology, and neuroscience of human capability formation. *Proceedings of the National Academy of Sciences of the United States of America*. 2008;104(33):13250-13255.

42. Knudsen EI, Heckman JJ, Cameron JL, et al. Economic, neurobiological, and behavioral perspectives on building America's future workforce. *Proceedings of the National Academy of Sciences of the United States of America*. 2006;103(27):10155-10162.

43. Organization for Economic Co-operation and Development. *Starting Strong II: Early Childhood Education and Care*. 2006. Available at: http://www.oecd.org/document/63/0,3343, en_2649_39263231_37416703_1_1_1_1,00.html#TOC Accessed May 5, 2010.

Data References

The Urban Child Institute. Early Childhood Development Public Opinion Poll. 2009.