

Factors Influencing Brain Development in Children

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Introduction

In recent years, more and more research is being done in the area of brain development in young children. Understanding factors that help or deter brain development is providing researchers' insight in what environmental and genetic factors play a role in the proper growth and development of children. Some of the general beliefs on raising children agree that providing a good prenatal care, loving and warm relationships between child and adults, as well as rich stimulating environment plays a large role in the development of children throughout their lives.

Knowing what factors are good for children helps in setting up the right school environments, better childcare centers as well as better training for educators. There are factors that one cannot control such as children living in poverty, children experiencing trauma and other factors that impact children and knowing how these factors impact a child can lead us into knowing how to handle such situations with children. Our research will address internal and external factors influencing the brain development of children.

Looking at external and internal factors effecting children is crucial for society to better prepare for our nations youth.

The interplay of nature and nurture is the key to Human development. The intricate circuitry of the human brain and how it is wired are affected by the impact of the environmental factors. These factors not only influence the general direction but are the basis of how a child will function on an emotional, physical, cognitive level as adults. The message from recent research on brain development is clear, babies are born with the instinct to learn but what they learn is up to us. The experience of a baby in the first three years of their lives has shown to have a largest influence on that child's development and learning. One of the main reasons the environment is seen as being so important is that the brain is not fully formed at birth, three quarters of the brain is developed after birth. After birth the changes that take place are a result of its environment. Genetics does influence the makeup of the brain but its wiring is influenced by the environment. USA article on babies and brain activity provided insight into the brain activity of babies and that of adults. Based on their findings, babies and children have more brain connections and activity than that of adults. Children actually show signs of logic, analysis and experimentation in their early years. Findings from the study show that educators and care givers do not necessarily have to provide new educational schemes to develop children, but rather depriving them of activity is known to decrease brain activity. Parents need to use their natural instincts and interact with children with touch, talk and affection to aid in the natural learning process of babies to develop (USA Magazine, 1999).

Nature's natural process of communication between child and adult is best seen in some of the classic examples of environmental influence such as the effect of talking to babies when they are born. Children who have experienced conversations and story reading early on show greater language development than those children without such

experiences (Strickland, Susan J. 2001). But there are other factors that have been seen to play a large role in developing the brain in children. A study done to better understand the environmental influence on children by Mlyarenko & Kuraev looked at the impact of music on brain development in children 4 yrs old. The study compared the effects of children exposed to music every day for about an hour for the period of 6 months to those of children without music. This study took place over a 6 month time frame and children brain activity was measured. Development or changes in the brain were measured by looking at the interhemispheric coherence between the subjects than their control groups. Findings from the study revealed that children exposed to music had relatively more grey matter in volume in left and right primary sensorimotor regions. The left region had more intraparietal sulcus region than the right and pronounced differences seen in the cerebellum bilaterally. The findings from the study showed that an increase in the bioelectric activity parameters especially in the left hemisphere as well as enhancement of the coherence function was most prominent in the children exposed to music. There was actually a decrease in the interhemispheric range in the control group. It is clear from the findings that the music plays a large part in developing a child's brain and we as educators can learn from these findings to better develop an environment to enhance brain development in children. Knowing the influence music has on children, educators must integrate this in their curriculum (Mlyarenko & Kuraev).

Environmental factors have been seen to be an integral part of a child's development, but there are internal factors too that impact the development of a child. One study looked at the basic difference of gender on brain development. Brain development influenced by genes and environment is also known to be effected by gender. Comparison of brain differences in gender through age were studied by Durstan,

et al. They used various other research materials on brain development, measuring subject ages, total number of subjects, and what areas of the brain were measured in each study. Findings from the various experiments concluded that total brain size does not increase after 5 yrs of age. White matter and corpus callosum area of the brain increase during childhood and into adulthood where as the grey matter is seen to show a net decrease. The areas of increase are in relation to primary and motor functions necessary for a growing child in order to learn its environment. Another relevant finding was that boys were seen to have a larger brain than girls, a difference of 10% but this difference was seen to level out in adolescence. Findings from this study show that there are some gender related difference as well as changes in the brain with age. The most crucial and active time in a child's development is seen from birth up to age 5 yrs of age (Durstan, et al 2001).

With 5 yrs and under being the most crucial time of child development we can make use of music, touch, and amount of time spent by adults talking to children in early years to enhance brain development in children. But there are some external influences that impact brain development in babies before they are born. Nutritional influences on children before birth and after birth is also a leading research topic for many. As a baby grows inside its mother, different parts are being formed with each stage of pregnancy. Nutritional deprivation at a specific time can result into that part of the baby being underdeveloped. Premature babies are also an outcome of malnourished mothers, premature babies are more susceptible to health issues, process information slowly, slower cognitive development and show difficulty in school. The potential of recovery for malnourished babies is dependent on getting improved nutrition, environmental stimulation, and emotional support even if intervention occurs after the period of

maximum brain growth. Findings from this study and others of the like are most useful in developing means of supporting pregnant women, providing government and state supported programs to aid in providing food for the poor. Children living in poverty can still be treated when given the right environment and for schools this is an excellent reason to have a food program at the center (Tanner, et al 2002).

Conclusion

Brain development is a process seen most active in a child's beginning five years of life. The brain is functioning the most in the early months; the child is instinctively prone to learning and has the logic and desire to learn. Nature provides the tools necessary for a child to grow into a health and happy adult. But with nature comes the influence of nurture as well. External factors can play a large role in the successful growth and development of children. Factors like music, touch, talking and interacting with babies, gender, poverty and nutrition were some that were discussed. When a child is born into this world, his personality and brain setup is already in place, the wiring of the neurons happens more actively as he interacts with his environment. Parents and teachers can learn from a child's history and determine the right factors that would lead the child to become successful adult. It is critical to man kind to better understand how to make children successful because leading a child into failure is a sin.

More research is needed in areas of brain development and disorders. What factors lead a child into psychological issues, what is the influence of brain development in siblings and extended family influence on children, how does divorce impact the mother and her baby before and after birth? In an ideal world families would be together focused on their

children, but in today's environment the ideal is not longer there. Divorce and economical factors take away from the ideal. By reminding parents about their children and how children develop, what parents must do to support their children, and how to become responsible parents, maybe the ideal for children can be achieved as once imagined.

Bibliography

ARE BABIES SMARTER THAN ADULTS.(brain growth in infants and toddlers)(Brief Article). (Dec 1999) In *USA Today (Magazine)*, 128, p11. Retrieved September 11, 2006, from *Expanded Academic ASAP* via Thomson Gale:

http://find.galegroup.com/itx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T003&prodId=EAIM&docId=A58037920&source=gale&userGroupName=sccu_main&version=1.0

Music and the Brain in Childhood Development. (Winter 2001) In *Childhood Education* 78, p100(4) (Review of Research) Strickland, Susan J. Retrieved September 11, 2006, from *Expanded Academic ASAP* via Thomson Gale:

http://find.galegroup.com/itx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=EAIM&docId=A81857982&source=gale&userGroupName=sccu_main&version=1.0

The development of brain electric activity in 4-year-old children by long-term sensory stimulation with music. Malyarenko, T. N. ; Kuraev, G. A. ; Malyarenko, Yu.E. ; Khatova, M. V. *Human Physiology* Vol 22(1) (Jan-Feb 1996): 76-81

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http://firstsearch.oclc.org/WebZ/FSQUERY?sessionid=fsapp13-53799-erz69rf8-j4u8vl:entitypagenum=3:0:numrecs=1:searchtype=locateFT:tdbname=WilsonSelectPlus_FT:query0=sc%3d%220890-8567+200109+40+9+1012+AMOTDH+%3F%22:format=BI:entityfttoprecno=1:next=NEXTCMD%7FFTFETCH:rule=0:tdbname=WilsonSelectPlus_FT:issuesici=0890-8567+2001+40+9:fetchtype=fulltext:tdisplaydbname=WilsonSelectPlus_FT:thirdpartydbid=461:isbillable=TRUE:isdirectarticle=FALSE:numrecs=1:format=BI:ftformat=HTML:entityemailfullrecno=3:entityrecno=3:entityemailfullresultset=1:entityemailftfrom=WilsonSelectPlus_FT:%7F

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