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The Factors in Prenatal and Perinatal Sensory Input

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Abstract: During its embryonic formation the brain develops its lower centers and large neural trunks by genetic mandate. While, the upper neural growth is dependent to a large part on the sensory input provided during growth and maturation. The various types of sensory and extrasensory input are reviewed. Post birth factors having effect on intellectual development are presented. A comparison of human process with animal imprinting is made. The way in which the environment imprints and alters genetic expression is explored.

Zusammenfassung: *Die Bedeutung von pränatalen und perinatalen Sinneseindrücken*. Während der embryonalen Organbildung entwickelt sich das Hirn in seinen unteren Zentren und den großen Nervensträngen entsprechend dem genetischen Programm. Hingegen ist die Entwicklung der oberen Nervenzentren zu beträchtlichem Ausmaß abhängig von dem sensorischen Input während des Wachstums und der Reifung. Die verschiedenen Typen sensorischen und extrasensorischen Inputs werden dargestellt. Auch auf nachgeburtliche Faktoren, die Auswirkungen auf die geistige Entwicklung haben, wird hingewiesen. Die Vorgänge beim Menschen werden mit den Prägungen beim Tier verglichen. Wie die Umgebung die Genexpression beeinflußt, wird erforscht.

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Introduction

The evolution of human consciousness in the preborn baby is a new area of exploration drawing the attention of investigators world wide. Reflex responsiveness begins in the first trimester of pregnancy, and is soon followed by conscious responsiveness in the second. That is not to say that cellular consciousness, soul, and telepathic consciousness do not exist. I am convinced that these types of non-local consciousness are present and active in providing stimulation for the developing nervous system. David Chamberlain (1998) describes how a sixteen week old fetus attacks the barrel of an amniocentesis needle. At that age the eyelids are fused, but he describes the preborn as moving with coordination, and what he calls "eyeless

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vision". Is this in fact the same ability described by Russell Targ (Targ and Katra 1998) in his books on psychic abilities and remote viewing?

The underlying principle of my discussion is that neural development and what has been called local or place centered consciousness is dependent on genetic input for the formation of the lower neural centers and larger neural trunks. The upper neural centers and fine complex branching more peripheral brain. is largely dependent upon sensory stimulation (Apgar et al. 1957; Diamond and Hopson 1998; Edelman 1987). The mechanism by which this happens appears to be that when a stimulus, a signal, causes depolarization of the neuron conductive membrane the energy input allows the dephosphorylation of the micro tubular protein (Aoki and Siekevitz 1985, 1988) that surround the growing budding neuro fibrils. The micro tubular protein "skeleton" of the brain will than canalize and form multiple connections (Jameson and Caplow 1981), and neural growth factor will facilitate the clasping of the fibers (Diamond and Hopson 1998). Without stimulation the micro tubules don't form and neural connections don't occur. Each neuron or group of neurons has its own time table its own developmental window when it must be stimulated or have its capacity reduced (Edelman 1987; Van de Carr 1985). In every day terms it was found that sensorial deprived children in an institution were mentally retarded. but if they were adopted before the age of two they would reach normal intellectual function. If they remained in the institution after age two they remained retarded. Even more disturbing is that when infants under fifteen months are placed in day care centers with more than three babies per care giver they will show decrease in intelligence (Clark-Stewart 1998). We must keep in mind that brain development and streamlining doesn't stop at age three but goes on actively till age fifteen, and mental stimulation has positive benefits throughout our life (Diamond and Hopson 1998).

With this in our minds I think its appropriate to review the various the various types of stimulation that can occur. First of all, we have genetic input that controls the biochemical basis of neural function. Robert Plomin of London's Institute of Psychiatry (Begley 1998) claims to have found a Smart gene on the fifth allele of chromosome six. It is associated with a receptor substance for Insulin Like Growth Factor (IGF2R) However, it turns out that the environment can act to change genetic instruction. The IGF2 itself is controlled from the eleventh chromosome and is imprinted by whether it came from the father or mother (Feinberg 1994), The mother's physiology demethylates the DNA and turns off the gene. There for even "genetic instruction" can be modified by environmental input.

The lower brain centers, with largely a genetic mandate for their formation, send wave pulses of electrophysiological energy into the less organized areas of the brain (Llines 1988).

We are all familiar with the autonomic maternal stimulation. The motions of the heart and lungs act as a metronome organizer for the developing consciousness, although tempered over time by habituation. Then there are random sounds from the mothers surroundings. These can be sudden loud noises at 110 decibels or familiar repeated pattern at 70 decibels like the sound of a shower door closing followed by the sound of running water. There is of course the tactile, vibratory, kinesthetic (Gidoni, Casonaton and Landi 1988), oral and olfactory input from the environment (Chamberlain 1998), with which we are all familiar. There seems

to be additional sensory input for magnetism as evidenced by micro granules of iron compound in certain nerve cells. Similar granules are found in the brains of homing pigeons. Gravity is of monitored by the semicircular circular. Recently the U.S.A. N.A.S.A program announced that gravity would be needed in any long term planning for reproduction in space. This was because space born animals that are not exposed to gravity have a defect in semicircular canal functioning. They have inadequate gravitational stimulation before the developmental window for this function closes, and they cannot effectively ambulate in a gravitation field.

Maternal emotional and neural transmitter input is important because it can tell the unborn how to "feel about" certain sounds or activities. Maternal sexual pleasure in third trimester can have profound effects on fetal physiology. The preborn than senses changes mothers neurotransmitters and relates them to auditory, tactile, kinesthetic or other input occurring at the same time. Could these emotional chemical messengers also contribute to the preborns sense of being wanted (Sonne 1996).

Deliberate Maternal Communication with the Fetus

Let us consider, deliberate maternal, or paternal, communication with the fetus. In 1979 I felt that a structured program of prenatal stimulation would be the most effective way to apply the stimulation principals to my patients. We called it the Prenatal University Program (Van de Carr, Van de Carr and Lehrer 1988; Van de Carr, Lehrer and Van de Carr 1984; Van de Carr and Lehrer 1986, 1992; Van de Carr 1985, 1998). It consisted of paring mother or father voice and hand stimulus together, for instance, repeatedly saying "pat, pat, pat, rub, rub, rub" while the hand was respectively patting and rubbing the preborn baby's back. Many other actions that accompanied a descriptive word were added. We also outlined a postnatal stimulation program which utilized the words presented before birth and matched them with sensations or objects presented after birth. Our prenatal program was designed to: one, teach the mother and father to follow a stylized tactile-vestibular, verbal system of exercises. This pattern of relating becomes habit, and the parents will continue to interact with the baby in this way after birth; Secondly, to enable the fetus to be more interactive with the surroundings and therefore enable the fetus to receive added environmental feedback (Van de Carr, Lehrer and Van de Carr 1984) during pregnancy and early development. Our results indicated earlier verbal, and cognitive capability as well as earlier maturation as evidenced by dental growth and Apgar scores (Apgar et al. 1957; Van de Carr, Lehrer and Van de Carr 1984).

American Indians First Used Prenatal Stimulation

I thought all this was very original till recently heard the story (Miller 1996) of a Cherokee Indian medicine healer called "taking a horse's spirit" You must remember that historically, the Indian's life was often dependent quality of his horse. Mares, in the sixth month of gestation, were given to children and placed in small corrals. While they curried the mares the children would talk especially to the side of the mare where the unborn colt was located. With the flat of the palm pressed

firmly against her stomach in different places as they talked to the colt. They did this on both sides of the mare. When the colt turned over and dropped to the bottom of her stomach latter in the gestation, they would do this three to four times per day with one hand under her stomach and the other palm down on her back. At birth they waited till the mare would talk to the foal. After the chord was severed and the foal on it's feet, they than said the same thing to the foal they had been saying all along, and put their hands around the foal's nose for olfactory stimulation. The author also states that the technique is the same for making coyote pups into pets. The Comanche Indians in Oklahoma used a similar technique of foal imprinting. Dr. Robert M. Miller states that imprinting shows good results. He has found that these horses consistently turn out to be gentle well mannered horses who enjoy and respect humans, and who are extremely responsive to future training.

Fetal Self Stimulation

An other source of sensory input is fetal autonomic and reflex action. The baby's own heart and breath motions within the womb will effect the preborn's neuro physiology. However at 35 weeks pregnancy the breath motions are also under the fetuses voluntary control. With ultrasound I have observed a fetus with breath motions in time to Beethoven's Fifth Symphony which I Was Playing during the examination. When I stopped the music, then the breathing stopped. When the music started again breathing started again, but not in time with the beat. However, the baby skipped a breath and again was in cadence with music.

Voluntary and self stimulation certainly occur within the womb. The preborn stretches, rolls, kicks, twitches, plays with his fingers and toes, and sucks his thumb. A study (Van de Carr 1985) of premature using non nutritive nipples showed them to be more organized and alert. What if the preborn is sucking because of anxiety? Over the years I occasionally noticed babies at birth that have red abraded skin at the base of each thumb or blisters from sucking within the womb. These areas are tender to touch. What could make the preborn suck an area that is very painful to touch? I talking to the mothers. They seem to have in common a lot of anxiety about come again go again mates. Is the fetus voluntarily endeavoring to reduce anxiety through oral stimulation? What of the preborn who hears his mother and father arguing and kicks his mother so hard as to bring her to her knees with tears in her eyes, and the argument is over. Does the preborn consciousness have a sense of accomplishment and power? Does he think "I did it" Perhaps even the sleep or dream state may be adding stimulation that is special, or part of the none local consciousness. Premature babies demonstrate REM sleep, and these are the states where precognition has been extensively tested. Remote vision and out of body experience are usually associated with closed lids (Targ and Katra 1998).

The birth experience and its profound and permanent effect on the consciousness have been demonstrated by Chamberlain (1998) and many others.

Post Birth Imprinting

The early post birth sensory input is also very important. When I spoke to Dr. Miller, a veterinarian about "imprinting." He indicated that goats can be imprinted so as to prefer sheep rather than their own kind. He said that horses are a precocious animal and imprinting time may last twenty four hours or less. He felt that dogs may have a 4 week time for imprinting. A llama raiser in Oregon described her process of stimulation twenty minutes twice daily for the first two post birth days. This animal work in perinatal stimulation demonstrates that, the anatomy and physiology of higher level neural tissues provides a sense of appropriate belonging, and bonding, and is responsive to experiential input up to the first twenty four hours (horses), forty eight hours (llamas) after birth. If sufficient appropriate stimulation is not supplied during the time that the developmental window is open than the individual may have permanent reduced capacity in this area At the same time human brain plasticity in the young is very forgiving and function can be switched from inactive to active areas (Diamond and Hopson 1998; Edelman 1987). For instance, in dyslexia, an area normally functioning to integrate visual input with phonics is not active, and a less efficient area for integrating sound and vision in the frontal lobe is utilized. Simply put, the substitute connection doesn't work as well.

The newborn infant has a longer developmental window where sensory input exhibits profound effects. Initially the mother is usual supplier of stimuli for the baby. It is the frequency, length, speed, manner, and complexity of those interactions with the mother (Van de Carr 1998) that can profoundly effect neural growth and capability. If new born gull chicks (Crowell-Davis 1997) are exposed to the visual stimulation of a horizontal line moving back and forth, it will cause them to peck at the line. Move it faster and they peck faster. After a few days this response becomes reflex and the chick pecks at hyper normal speed. Could it be that what veterinarians call "a critical window for imprinting," has application for human consciousness? Can such things as such how fast and individual assimilates and responds to sensory data be modified during this time.

Conclusion

Environmental input seems to be taking an increasingly important role in the anatomic and functional development of the human intellect, and even includes modification of genetic instruction. Pre- and perinatal stimulation and sensory input have profound and lasting effects upon human consciousness.

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