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PSYCHOGENIC BRAIN DAMAGE AND THE BLACK CHILD.

Psychogenic Brain Damage and the Black Child: The behavior of human beings whether psychological, social, cultural, lingual or intellectual, is to a very great degree determined by the unique structure and organization of the human central nervous system. This system which consists of the human brain and spinal cord, is the true foundation of Man's superior standing above the other members of the animal kingdom. While the human brain and spinal cord, especially the brain which organizes and structures individual and group physical, social and intellectual behavior, are fundamentally the product of genetic interaction during various stages of development, we must not overlook the extremely important role played by non-genetic physical and social factors in these areas of human behavior. We've already discussed the effects of the physical prenatal and postnatal environmental factors such as adverse intrauterine conditions, genetic defects, ingestion of harmful substances during pregnancy, and malnutrition, on the development of the brain and the behavior it mediates. Therefore, after a brief review of the early development of the brain we will concern ourselves with the influence of psychosocial factors on the structure and organization of the system.

During the period of the 3rd to 6th months of prenatal life the size of the fetal brain increases very rapidly. This remarkable increase in brain size is due chiefly to the rapid multiplication of the number and size of the fetal brain cells. The structure and organization of the newborn's brain is very incomplete relative to its adult structure and organization. Though the newborn's brain size exceeds 10% of his entire body weight (as compared to approximately 2% of his adult body weight) it is not until "by the end of infancy, at about two years of age, the relative size and proportions of the brain and its sub-divisions are essentially similar to those of the adult brain (12)."

The brain of the newborn is more fully developed in its lower and posterior regions i.e., regions chiefly responsible for regulation of the body's autonomic and sensory functions respectively, than in its frontal or anterior regions which are roughly responsible for skilled motor and intellectual behavior. The brain undergoes a two and one-half to threefold increase in size during the first year, increasing from a weight of some 350 grams at birth to about 1000 grams at the end of that period. This rapid increase continues until about the age of 2 years after which its growth rate slows down (12).

Noback is fundamentally correct when he states that:

The genetic code, acting through its biochemical control system, is instrumental in establishing the complex structural functional matrix of the nervous system as expressed in the patterning of the nuclei, pathways, circuits, and synaptic connections.

However, the growth of the human brain during its early years involves more than its construction according to the genetic blueprint.

What then, does the growth of the human brain during its early years entail? Ashley Montagu (11) answers this question very succinctly:

This growth entails the forming of connections between nerve cells within the brain, thus enabling messages to be sent from the brain to the muscles, telling them how to move; from the skin and the inner organs to the brain, giving it information about feelings; and from one part of the brain to another, making possible the integration of different kinds of information and consequently such human qualities of mind as language, visual imagery, verbalizable emotions, and so on. These neural pathways are not formed automatically; rather, they develop as a result of experience which provides input and therefore stimulation to the brain's growth.

In the last sentence Montagu quite properly alludes to the fact that the structural, organizational and functional aspects of the brain are not completely determined by the genetic code, that the brain is highly plastic in nature, i. e., it is to a very significant extent structured and organized by social and psychological experience.

One of the most important properties of the human brain during development is its plasticity, or ability to change and be molded under the influence of the external environment. It is able to receive and use stimuli from the outside during its exceptionally long developmental period. These stimuli can actually cause both structural and functional changes, which will then affect the way the brain will respond to the same stimuli in the future. This is one of the ways in which learning takes place (Shenour, 17).

There is a substantial amount of experimental evidence which indicates that the external environment and the individual's experiential interaction with it bring about definite changes in brain structure and biochemistry and play a

significant role in the formation of functional contacts between nerve cells in the brain (15, 15, 16).

The Brain As A Statistical Unit. The brain in executing its control over behavior neither functions as a total unit with all of its parts equally involved or equally contributing to the behavior taking place under its direction nor is relevant behavior completely controlled by some isolated, independent area of the brain. The brain operates on a statistical basis, i.e., the occurrence of a particular behavioral act, whether physical or mental, is the averaged outcome of the coordinated input of any number of brain regions or cells.

E. Roy John in 1972 proposed a theory of brain function which concisely expresses the concept of the brain as a statistical unit (6) His theory which he calls "statistical configuration theory" proposes that:

... sensory information is diffusely available to most if not all brain regions, and movements can be initiated from a wide variety of structures. Information is represented, not by activity in a specific neuron or a selected pathway, but by the average temporal pattern of firing in anatomically extensive populations of neurons. The activity of any neuron, ... is only significant insofar as it contributes to the average behavior of the ensemble, to the statistical process. The difference between brain regions is not "all-or-none" qualitative mediation of specific sensory, motor or other functions but the "graded" quantitative representations of different functions...

A. R. Luria (7) in a 1970 article in the Scientific American magazine titled "The Functional Organization of The Brain" develops concepts related to those of John's statistical theory. He notes that at least three-fourths of the cerebral cortex of the brain have nothing to do with sensory or motor functions. That is, the parts of the brain mainly responsible for perception and movement comprise only a small part of the cerebral cortex. He therefore concludes that in these non-sensory and non-motor areas must be located the systems responsible for the higher, more complex behavioral processes.

Luria conceives of the brain as consisting of three major functional units—the first unit which "regulates the energy level and tone of the cortex, providing it with a stable basis for the organization of its various processes" is located in the lower part of the brain. The second unit which plays the major role in analyzing, coding and storing information is located in the back half of the brain and the third unit is involved in "programming, regulating and verifying mental activity," is located in the front half of the brain. This unit which consists primarily of the frontal lobes is also "involved in the formation of intentions and programs for behavior." They accomplish this in part through the activation of the brain and the regulation of attention and concentration. Electrical studies of the brain indicates that whenever mental

activity is engaged in a complex of electrical excitations occur in the frontal regions of the brain and that these excitations disappear when mental activity is ended. According to Luria the relationship between the three functional units of the brain and their constituents is such that —

It is clear that every complex form of behavior depends on the joint operation of several faculties located in different zones of the brain. A disturbance of any one faculty will affect the behavior, but each failure of a specific factor presumably will change the behavior in a different way... One should therefore expect that lesions of the structures involved might result in changes in the behavior, and that the nature of the change would vary according to the particular structure that is damaged.

Psychogenic Brain Damage. The principal concern of Luria's work to which we referred above was the effect of physical damage or malfunction in specific areas of the brain on behavior. We are not concerned here with the effects of physical damage of certain areas of the brain on behavior, but with the effects of psychological brain "damage" of these regions, particularly the frontal region, on behavior. For it is our contention that within certain sociocultural contexts, the presence or absence of certain psychological experiences can have the same effect on a person's behavior as actually physical damage to a particular area of the brain had occurred. In other words, poor programming of or socialization of the frontal regions of the brain produces behavior which is equivalent or similar to actual brain damage in the same regions.

The concept which we wish to develop here is similar to Ashley Montagu's (11) concept of "sociogenic brain damage" which he defines as follows:

Sociogenic brain damage refers to damage done to the maturation of the brain by depriving it of the social stimulation necessary for the development of those neural interrelations essential for successful mental functioning. By "successful" here I mean the ability to make the appropriately successful responses to the challenges of the social environment. It should be emphasized that by "damage" I do not mean that any nervous tissues are destroyed, but rather that normal growth and the development of neural connections fails to occur in the absence of the necessary developmental stimuli. Just as in physical malnutrition, nerve cells fail to grow and develop properly, so also in social malnutrition, where the physical nutrition may be quite satisfactory, there is a similar failure of neural growth and development.

Sociogenic brain damage is a condition produced by impoverished social environments. There is reason to believe that poverty and the

ghetto, often associated with both physical and social malnutrition, constitute a combination of conditions capable of producing severe failures in neural development with its attendant failures in learning ability...

Our concept of psychogenic brain damage concerns itself mainly with deleterious effects of the failure of properly programming, during sensitive periods of the child's development, of his frontal lobes which prevents him from behaving in an appropriate social and intellectual manner. While the failure of proper programming may or may not affect the normal growth and development of neural connections it certainly causes the frontal lobes to behave as if they have been incompletely developed, damaged or surgically disconnected from the rest of the brain which it is responsible for regulating so that certain behavioral ends may be achieved.

The Frontal Lobes. We've already indicated that some of the general functions of the frontal lobes include the formation of plans, intentions, of programs of behavior, the regulation of attention and concentration. The frontal regions are chiefly responsible for regulating the rest of the brain and body so that the individual may behave in a way appropriate for completing a planned program of action. They observe and evaluate the behavior as it is being performed and compares the completed behavior with the original plan of action, correcting as much as possible any deviations from the plan. The frontal lobes have the very important responsibility of allocating the appropriate mental and physical energy available to the individual so that set goals may be achieved. They also regulate the individual's attention and concentration so that he may not be easily diverted from his goals by irrelevant stimuli. Thus as Luria (8) concluded... "the frontal lobes of the brain are among the vital structures responsible for the orientation of an animal's behavior not only to the present, but also to the future, and are responsible for the most complex forms of active behavior."

The acts of programming, regulating and verifying behavior is accomplished by the frontal lobes with the aid of speech. Though instinctive, elementary forms of behavior take place with the aid of speech, complex and higher mental processes depend heavily on it.

As pointed out some time ago by Vygotsky (19) speech which is utilized by the frontal lobes is social in origin, i.e., it is introduced into the individual as a result of his interactions with others (and as a child, with his relations with adults). It therefore stands to reason that restricted, distorted, negative human relations, (particularly in the early years of development) and the speech engendered by these kinds of relations, when utilized by the frontal lobes as a means of regulating behavior brings about social and intellectual maladjustment.

Development of the Frontal Regions. The frontal lobes as compared to the rest of the human brain are relatively late in completing their development. It is not until the child reaches the age of four to seven years are they ready to function in a manner similar to that of adults. The rate of growth of the frontal regions increases sharply by age 3½ to 4 years. A second period of rapid growth occurs around the ages of 7 to 8 years. These two growth stages are one of crucial importance because prior to the first one the child finds it difficult to follow spoken instruction since he is unable to resist being easily distracted by new or irrelevant events occurring in his vicinity. New stimuli easily diverts him from his original plan of action usually initiated by parental instructions. Only when the first growth stage is reached is the child able to follow through on spoken instructions in a fairly reliable way without being easily distracted by irrelevant stimuli. During the first stage of rapid frontal region growth the child gains the ability to subordinate himself to the verbal demands and instruction of his caretakers. He begins to systemize these parental instructions and use them in regulating his own mental and physical behavior. He now gains the ability to recall earlier parental instructions, to order their fulfillment in terms of his immediate or future behavior.

It is not until the second and final period of rapid frontal region growth (shortly before entering school) that the child acquires an effective and reliable, socially-organized ability to focus his attention and effectively resist the distracting influence of irrelevant elements in his environment. The child by then has reached a higher level of behaving which is subordinated to the spoken demands or demands of adults and his own internalized speech.

Thus, it should now be apparent that the demands, instruction, values, etc., of parents and society begin to have major impact early on the child's behavior and his ability to control his own behavior early in his life. The ability to set goals, to follow instructions, to not be distracted by irrelevant occurrences, begins in earnest to develop around age 3, and continues to develop rapidly through the preschool period at about age 7 or 8. This ability which is handled by the frontal regions is aided importantly by the kinds of parental instruction the child receives from other adults and peers in his environment. And language is one of the principal means by which instructions are given to the child.

It would be mistaken to suppose that verbal intercourse with adults merely changes the content of the child's conscious activity without changing its form.

Intercommunication with adults is of decisive significance because the acquisition of a language system involves a reorganization of all the child's basic mental processes; the word thus becomes a tremendous factor which forms mental activity, perfecting the reflection of reality

and creating new forms of attention, of memory and imagination, of thought and action. (Luria and Yudovich, 9)

Since the frontal lobes mediate purposeful, goal-oriented and intellectual behavior and does so through the medium of language, the failure to properly instruct the child how to behave in a socially acceptable manner, the failure to instruct him in terms of definite, productive cultural norms, to supply him with an adequate vocabulary, to instruct him in socially acceptable ways of thinking, to teach him how to set goals and follow through on them, to give a positive image of himself and his ethnic group, to expand his views and experiences, all of these things which too often happen to black children, is tantamount to severely damaging the frontal lobes of these children. It behoves the alert black parent who is concerned about the successful social and academic adjustment of her child but cannot wait for the child to enter school so that he may learn to behave in a socially appropriate manner. If the child is not properly oriented by the time he begins school his chances of making a successful social and personal adjustment are significantly reduced and it will be more difficult after that time to normalize his behavior.

We have discussed psychogenic brain damage, particularly damage to the frontal lobes. We have asserted that psychogenic brain damage somewhat parallels actual physical brain damage. What then, we may ask, are the symptoms of frontal lobe brain damage? This is a very complex question and we will therefore not attempt to answer it in detail. However, we will list some of the symptoms of what is referred to as the "prefrontal syndrome" (a syndrome produced by extensive cutting of the nerve fibers running from the lobes to other parts of the brain or produced by lesions in those areas) - the inability in some people to synthesize information, "to maintain an energetic, goal-directed line of thought and behavior" (18), "lack of ability not to become distorted by irrelevant or immediate stimuli while pursuing a goal, blunting of the mind in general, lack of motivation, indifference, apathy, loss of "some of the very qualities that make them human: sensitivity, imagination, the ability to plan (14)," irresponsibility, social behavior, impaired judgement, reduced creativity, inability to perform tasks which involve delayed gratification under ordinary conditions, difficulty in solving verbal problems. Luria (10) sort of sums these symptoms up in his description of a patient who suffered from frontal lobe injury:

"... the patient begins to lose his stable system of interests and becomes indifferent, and his motives become narrow and primitive. He loses his intentions which he has formed; ideas coming into his head are transitory and put into operation with difficulty, or they easily disappear. This inability to concentrate on an internal intention, and the absence of persistent goal-directedness are among the most characteristic features of behaviour in lesions of the frontal lobe.

All-too-often we observe the symptoms which are characteristic of patients who suffer from frontal lobe damage also characteristic of much of the behavior of the inhabitants of the numerous black ghettos of American towns and cities. When we stop to think about this situation we soon realize that these people not unlike physically brain damaged patients have had their brains damaged by the psychological battering they have received at the hands of slavery, Jim Crowism, negative racial propaganda, poor schools, ignorance, malnutrition, and a hundred other evils related to white racism, bigotry and colonialism. However, more than these things it is the uncertainty of black life in America, the confusion among black parents as to theirs and their children's future, the marginality of being black in America, the lack of being an intimate and accepted part of a definite culture (blacks not fully having their own culture nor being fully members of the larger culture - they're "betwixt and between") the lack of a true black sense of self and identity, inability of blacks to control their own destiny and that of their children, which damages the brains of black American youths. These factors make it difficult for many black parents to properly program and orient their children and thereby equip the controlling parts of their brain (the frontal regions) so that their children's present and future behavior can be of positive personal and social value. Under current conditions it is difficult for many black parents to full-heartedly reinforce the aspirations of their children and thereby solidly instill in their children that definite sense of direction and high motivation which is so vital for academic and social success in America. This is the major reason that a strong sense of black identity and culture is so necessary for the mental health of black children and in turn the social health of America.

The "Split Brain." It is common knowledge that the brain consists of two apparently symmetrical parts. These are referred to as the left and right hemispheres. Though both hemispheres possess an apparent anatomical similarity, each being practically the same size and exhibiting the same general appearance to the eyes, recent research (4,13) has shown that there exists some intriguing and vast psychological differences between them.

Some years ago in an effort to alleviate the suffering of some patients who were prone to having severe epileptic seizures, a technique was devised which involved the cutting in half a wide band of nerve fibers connecting the two cerebral hemispheres called the corpus callosum. The problems ailing the epileptic patients were significantly relieved and they continued to function in their daily lives as normally as people who had theirs still connected. But it became apparent after careful experimentation and testing of "split brain" patients that the two hemispheres operated according to very different plans and dealt with the world in very different ways. It became dramatically

apparent that the two hemispheres were not mirror images of each other. Unfortunately the scope of our present study will not allow us to detail the exciting facts revealed as a result of the testing of "split brain" patients. Therefore, we must satisfy ourselves with only listing some of the functions of each hemisphere.

Generally it has been found that the left hemisphere specializes in functions which underlie the use of mathematics, language, scientific concepts, writing and logic. It deals with the world in a rational, verbal, analytical, well-ordered sequential way. It literally is that part of the mind which analyzes the world into many parts and is concerned with the lawful relationships between those parts. It generates mental concepts, classes and strata.

The functions of the right hemisphere are generally opposed to those of the left. It specializes in those functions which underlie the appreciation of music, art and dance. It is concerned with perceiving things as a whole, it tends to ignore parts, to concern itself with fantasy, sensuality and utilizes intuition as its chief mode of knowledge. It deals with concrete objects in physical space instead of conceptual objects in mental space as does the left hemisphere. Unlike the left hemisphere it tends to be receptive and is therefore more subject to the influence of suggestion.

Normally we use both hemispheres. If the brain in a more or less complementary fashion. However, it appears that early in life individuals begin a continued use of one hemisphere more so than the other. Thus, it seems that people can be generally classified in terms of which hemisphere dominates their behavior hence we have "left-hemisphere types" and "right-hemisphere types." These types are characterized by the functional orientation of their predominant hemisphere.

What hemispheric type the individual becomes seems to be determined by his personal, social, and cultural experience. At some point early in the life of the individual one hemisphere's functions becomes inhibited, repressed, or suppressed relative to the other. At that point the individual begins to behave as if his hemispheres were surgically disconnected or not in full and equal communication with each other (2). The individual who becomes too one-sided in the use of his hemispheres may develop a narrow personality and point of view. Which hemisphere becomes dominant in the life of the individual seems to depend on which of them has been the most successful in gaining for the individual positive rewards or the one which helps him to avoid negative experiences (3). It is possible and does happen that the two hemispheres with their two different approaches to the world often conflict with each other.

It appears that what applies to individuals here applies equally as well to groups of people. That is to say, just as one can classify individuals as left or right hemispheric types, groups can likewise be classified. The social, cultural

and historical experience of a people can apparently cause them to predominantly utilize the functions of one hemisphere in deference to the other.

The fact that the history of the black man in American has been one in which he is punished, ignored, or not rewarded by the dominant white society for exhibiting those things which characterize left hemispheric predominance such as assertiveness, intellectuality, independent and analytic thinking, etc., and his rewarding and encouraging those things which characterize the predominance of the right hemisphere such as: passivity, anti-intellectuality, sensuality, dancing, singing, entertaining, etc., might help to explain the following finding (14):

"Most people are dominated by one mode or the other," observes Dr. Ornstein. "They either have difficulty in dealing with crafts and body movements, or difficulty with language." Culture apparently has a lot to do with this. Children from poor black neighborhoods generally learn to use their right hemisphere far more than their left and later do badly on verbal tasks. Other children, who have learned to verbalize everything, find this approach a hindrance when it comes to copying a tennis serve or learning a dance step. Analyzing these movements verbally just slows them down and interferes with direct learning through the right hemisphere. (Emphasis by author).

While the ideas and implications developed above might be branded as tentative and tenuous it is undeniable that the historical experience of blacks in America has been such that they are literally forced to function with only "half a brain." Of course, whites in America also function with only half their brain also - the half opposed to that half used by blacks. Only the rewarding of their children by black parents and the black community for intellectual achievement, the sincere encouraging of conceptual thinking from the early years of their lives, can intellectual achievement become an integral part of their way of life.

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