Left or Right Brain Dominant?

By Dr. Lin Day, Baby Sensory

The brain is divided into two halves or cerebral hemispheres by a deep fissure. However, both sides of the brain are able to communicate with each other through the corpus callosum, a thick tract of nerve fibres that lies at the base of the fissure.

Although the two hemispheres appear to be similar, each half has its own unique set of functions. Studies show that the right hemisphere is dominant for emotions, creativity, music and rhythm and that the left brain is dominant for mathematical and language abilities. Although both sides of the brain have the ability to analyse, process and store information, form thoughts and ideas and make decisions, one side of the brain is usually more dominant than the other. Brain dominance affects learning, determines personality and influences behaviour.

Studies suggest that genetic makeup, prenatal conditions and early life experiences determine which hemisphere is to become the most dominant by two years of age. However, the most rapid period of brain growth is in the first year of life. This is why it is so important to provide a stimulating sensory environment from birth. Safety, warmth, nourishment, positive play experiences and the interaction of a loving adult are vital nutrients for whole brain growth and development.

Finding out whether a child is left or right-brain dominant can provide useful information about how they learn, about their behaviour and how they deal with emotional difficulties. However, classifying children into left or right-brained learners brings its own set of problems. There may be a tendency to generalise findings, to pigeonhole learning styles, interests and aptitudes, to ignore cultural

differences and to miss important phenomena. There may also be problems with what to do with the results once they are collected. Instead, it is better for parents and practitioners to provide a wide range of activities and environmental experiences that utilize whole brain development from the very beginning.

Brain asymmetry

As early as four weeks gestation, magnetic resonance imagery shows the two hemispheres of the brain to be bilaterally symmetrical. However, from 22 weeks gestation, the right hemisphere appears to be slightly larger than the left hemisphere. Some scientists suggest early development of the right hemisphere to be an evolutionary trait that ensures survival of the infant. A large number of studies now indicate that the right hemisphere is dominant for the emotional bond of attachment to the primary caregiver.

Asymmetry between the two hemispheres has been linked to the male hormone testosterone, which boosts right brain development and the female hormone oestrogen, which boosts left brain development. The left hemisphere is also more susceptible to injury from chemicals, drugs, alcohol, tobacco and viral infections than the right hemisphere. The migration of certain cells to the left and frontal regions of the cerebral cortex from deep inside the brain is another reason for delayed growth of the left hemisphere. The left brain may also be low in Omega 3 (see EYE January 2009), the main component for the construction of the fatty myelin sheath that covers the neurons and conducts electrochemical messages through them. These anomalies may help to explain the processing deficits associated with poor reading and writing skills in some children. Right brain dominance can also manifest itself as excessive crying, colic and feeding problems in infancy and as Attention Deficit Hyperactivity Disorder (ADHD) in childhood.

Left-right brain functions

Many of the methods used to determine the functions of the right and left brain were based on the work of Dr. Roger Sperry (1913 -1994), an American neurologist, who won a Nobel Prize in 1981 for his split-brain research. His research on patients with left-brain injuries confirmed that the left hemisphere was indeed responsible for speech and language processing. Further studies involved split-brain experiments in which the whole of the corpus callosum was severed in patients who suffered from a severe kind of epilepsy (epilepsy is caused by the excessive firing of millions of nerve cells in both hemispheres). The patient suffered less damage if the seizure was contained in one half of the brain.

Since Sperry's split-brain operations, the functions of each brain hemisphere are better known. The left hemisphere for example, is known to be responsible for the processing and analysis of hard facts. Analytical thought, logical thinking, sequencing, categorising, planning, speech, spelling, word and number recognition are now linked to left-brain functioning.

The right hemisphere however, specialises in the 'softer' aspects of personality and behaviour. Intuition, sensitivity, daydreaming, spontaneity, humour, emotions, exploration, experimentation, inventiveness, musical expression, hands-on learning and creativity are all functions of the right brain. The right hemisphere has the ability to visualise a picture, painting, map or construction and then determine the relationship between all of the different parts that make up the whole image. This is why right-brained people tend to be more creative than left-brain thinkers.

Psychologists agree that the two hemispheres do not work in isolation, but form a highly integrated system. Indeed, most everyday tasks involve a mixture of

left and right-brain skills. For example, the left hemisphere contributes to speech, but the right hemisphere contributes to the emotional content of words. Both sides of the brain are involved in using and understanding spoken or written language. The left hemisphere recognises the lines and spaces that make up the word 'cat', whereas the right side makes sense of the word by visualising how the cat looks. Both sides of the brain have their own, but very different talents.

Opposites

Each side of the body is controlled by the motor cortex, which extends across both sides of the brain. For example, the right hemisphere controls the left side of the body and the left hemisphere controls the right side of the body. Damage to one side of the brain therefore affects the opposite side of the body. For example, a stroke in the right brain hemisphere can leave the left arm and leg paralyzed.

Here are four simple tests that may suggest left or right body preference and left or right brain dominance:

1. Clasp your hands together. Which thumb is dominant? If it is your right thumb, then you may be left-brain dominant. If it is your left thumb, then you may be right-brain dominant.

2. Which foot is bigger? If it is your right foot, then you may be left-brain dominant and vice-versa.

3. Which ear picks up sounds more easily? Left or right? If your right ear is more dominant than your left ear, then 90 percent of the incoming information will be processed by your left brain. People who are right-ear

dominant often learn and think faster, and speak better than people who are left-ear dominant.

4. Are you left or right-handed? If you are left-handed, then you may be right-brain dominant and vice-versa.

Left handedness

Left or right-hand preferences have been observed in the womb. Ultra sound images show that 10 percent of foetuses suck their left thumb in preference to their right thumb. Indeed about 10 percent of the adult population is left-handed, although prevalence is greater in males than females. Preference for the right or the left hand is usually established by the end of the first year.

Left-handed children may find everyday tasks such as using scissors or a computer mouse difficult as most tools are designed to be used by the right hand. Learning to write can also be difficult for left-handed children. They may hold a pen awkwardly in order for it to meet the paper at the correct angle. Words may become smudged and untidy as the child is forced to put their left hand over freshly formed writing across the page. However, left-handed children have an amazing capacity to overcome their difficulties. Very often, they are high achievers in sports, music, art and mathematics.

There is plenty of evidence to suggest that mathematically gifted people tend to be left handed. Albert Einstein (1879 –1955), best known for his Theories of Relativity, was left-handed. His ideas came in pictures and images, which he translated into a mathematical framework. Advanced mathematical thinking often requires high levels of visual imaging and abstract thinking, which stimulates activity in the right hemisphere of the brain. Studies also show that left-handed people may be more musically talented than right-handed people.

Famous musicians such as Bach and Mozart were left-handed. Left-handed musicians today include Phil Collins, Paul McCartney, George Michael and Paul Simon.

Educational implications

The theory of left or right brain dominance can have implications for education. For example, right-brained children may prefer activities such as sports and action games and hands-on activities such as arts, crafts and music. They may also cope better with Geography and Geometry than with History and Algebra.

Left-brained children may prefer to use a step-by-step approach to learning or to problem-solving activities. For example, they may study the components of a model before attempting to construct it, whereas right-brain dominant children may prefer to see the model first and then break it down into smaller units. Some children will find both activities equally stimulating. These children utilise qualities from both sides of their brains.

Unfortunately, the educational system tends to favour left-brain stimulation. Left brained children often obtain better grades than right-brained children. This is because they are more likely to analyse and process information, answer questions quickly, keep to schedules and complete their homework. Left-brained children are more likely to end up in academic occupations such as teaching, medicine, law, technology and engineering. Right-brained children are deep thinkers and just as intelligent as left-brained children. They are usually spontaneous, imaginative, inventive, creative, social individuals who enjoy role-play, music and drama and dance. In later life, they may pursue careers in the arts, architecture, photography, dance and music.

There is some evidence that left and right brain understanding has led to a wider range of activities in the class room. In some schools, equal weight is given to the arts and to the sciences. Even so, there are still high numbers of children that struggle with reading and writing, calculation and test questions. Studies have shown that children that are most likely to succeed at school do most of their learning in an environment that utilizes all of the senses.

Conclusion

Scientific research increasingly supports the implication that early life experiences can have a significant effect on the development of the whole brain. Well established findings in developmental neurobiology suggest the critical period for learning to be in the first year of life at a time when the brain shows most plasticity. The young brain is very flexible and sensitive to events in the outside world, and it is therefore important that parents and practitioners expose babies to all sorts of learning experiences. Studies have also provided powerful justification for high quality pre-school education. Research shows that nursery children are more likely to engage in complex activities involving left-brain thinking if the experiences are embedded in their interests. Children that are able to pursue their interests also develop social, language and cognitive skills that provide the basis for whole brain development and receptive learning. Overall, research suggests that a rich environment can have long-lasting implications for the future.

Practitioners that wish to find develop this area further might find the following journal references helpful:

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