Left Brain, Right Brain: Fact and Fiction

by Elizabeth Hampson, PhD

The "left brain, right brain" concept of brain function has become a recent fad in popular magazines and among some laymen and teachers. To what extent are the ideas we hear about really based on scientific evidence?

This concept has been over-simplified and over-generalized in the popular press, leading to confusion and some mistaken ideas about hemispheric specialization (as it is known in scientific circles). Modern researchers have many techniques available to them to study hemispheric specialization. We can examine people who have brain damage limited to one hemisphere. Or we can monitor patterns of blood flow and glucose use, or patterns of electrical activity in the brain while people are working on different kinds of tasks. In the 1960's, Nobel Prize winner Roger Sperry and his co-workers studied a special group of people who had had a brain operation to control epilepsy, which involved cutting the band of nerve fibres that normally inter-connects the two hemispheres and allows them to communicate. Following surgery, each half of the brain functioned on its own; so it became possible for the first time to study the capabilities of each hemisphere independently. We know from studies like these that the left and right sides of the brain are equivalent at analyzing basic sensory information or generating simple movements.

But the two hemispheres are not equally proficient at some other functions, including the ability to generate speech and perform complicated visual-perceptual analyses. From popular magazines, you might have the impression that the left hemisphere is completely responsible for language, while the right hemisphere is the one that controls visual perception. This impression is over-simplified in three ways.

First of all, the specializations of the two hemispheres are not limited to these two areas. Secondly, for most functions, the division of labour between the hemispheres is not really this black-and-white. Hemispheric specialization means that one side of the brain is more adept than the other. It does not necessarily mean that the other side cannot perform a function at all or is not routinely involved in a particular activity. Thirdly, specializations tend to be for skills that are much more specific and circumscribed than "language" or "perception" as a whole. The most radical division of labour between the hemispheres, as far as we know, occurs for speech production, which is mainly controlled by the left side of the brain, at least in most people who are right-handed. This left hemisphere predominance is the reason that people who have strokes, for example, may have problems speaking afterward, if the left

side of the brain is seriously affected. Even for language, however, specialization is a lot more complicated and incomplete than the popular press would have us believe. Sperry's "split-brain" studies, as well as studies of adults with reading problems acquired as a result of brain damage (in a previously-normal reader) have shown that the right hemisphere has some language comprehension abilities. This may be especially true in females. Furthermore, even for spoken language, the right hemisphere may routinely be involved in aspects of speech comprehension, such as decoding the meaning of the changes in tone of voice that occur during normal speaking. There is even evidence that the right side of the brain is important in drawing inferences understanding connected discourse and in appreciating non-literal parts of speech such as idioms and metaphors. Therefore, not all aspects of language are exclusively controlled by the left hemisphere.

The right hemisphere, too, has its own specialization. We often hear that drawing is an activity governed by the right side of the brain. But actually drawing and other constructional activities, such as building things out of blocks, require both hemispheres. The notion that the right hemisphere is the only one active when people draw probably came from the fact that the right hemisphere is particularly adept at understanding some kinds of spatial relations among objects or in diagrams. But even here, the evidence suggests that the left hemisphere is not incapable of such a function, only that it is less competent than the right. I know of no convincing scientific evidence that the right hemisphere has any particular specialization for a number of abstract functions often attributed to it, including "intuition" and "creativity".

The split-brain studies of Sperry and his co-workers showed what each hemisphere can do when severed from its mate; however, the two hemispheres normally don't operate independently. In normal people, the corpus callosum is usually abuzz with communications being transmitted between the two hemispheres. This sort of left- and right-brain interaction is routine for most activities, and especially for complex thought processes, which typically require integrating many kinds of information.

This brings us to another popular notion: does it make any sense to classify people as "left-brained" or "right-brained"? It is a mistake to think that any normal person uses one side of the brain selectively for thinking. If a child is intuitive, not verbally-adept and excels at expressing himself in pictures rather than words, the child may be especially proficient at some abilities and less proficient at others, but it does not mean that this child relies on only one hemisphere. Virtually all behaviours and modes of thinking require both hemispheres working together.

Let's consider some recent magazine articles with titles like "Are you a left- or right-brained lover?" ("Glamour"), or "Are you left-brained or right-brained?"("Teen Magazine"). Here are a few examples from a quiz that "Teen Magazine" claims will tell you whether you are left- or right-brained: "I'm pretty good at math", "I always wear a watch", "If someone asks me a question, I generally turn my head to the right", "When I talk, I gesture a lot", "I like to draw", "I've considered becoming a poet, politician, architect or dancer". Although it might be fun and entertaining to do these kinds of quizzes, the questions are not scientifically valid, and your answers probably reveal more about your personality or how you were raised than which side of the brain you routinely use. It is just plan untrue that some of us tend to use only one side of our brains. Hemispheric specialization is a reputable scientific concept, but interested readers need to look beyond popular magazines to get a realistic idea of what "left-brain, right-brain" is all about.

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