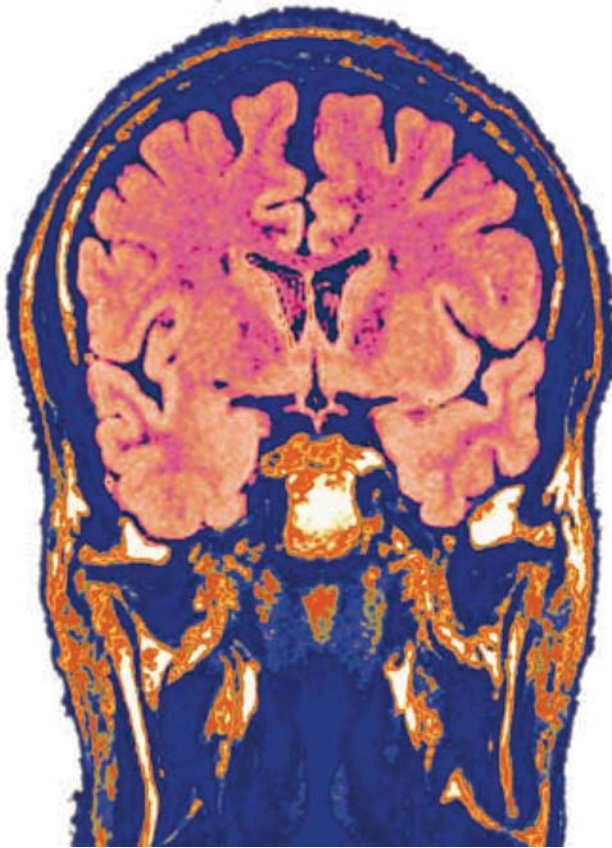


The Left Hemisphere Sees the Trees; The Right Hemisphere Sees the Forest

New research, for the first time, indicates a consistent difference in visual perception between the right-handed and the left-handed, stemming from a difference in function of the right and left cerebral hemispheres.

The Surprising Find and Further Surprising Research Which Offers a Hypothesis of an Explanation

The research by Carmel Mevorach and Prof. Glyn W. Humphreys of Birmingham University with Dr. Lilach Shalev of the Open University was published in the prestigious journal Nature Neuroscience. The findings: Our perception of the whole and of the parts of a visual stimulus which was previously shown to be mediated by different brain regions is different for right- and left-handed people. While the left hemisphere of right-handed people is responsible for seeing the particular, the local – the trees; – for left-handed people it is the right hemisphere which is responsible for that.



Certain differences between “righties” and “lefties” have been well documented with regard to language functions: the left hemisphere of right-handed people is responsible for language processing, however with left-handed people it is the right hemisphere.

But a clear-cut dynamic of difference in visual perception and interpretation of visual stimuli by the left-handed and the right-handed, has never been identified, not to mention the possible implications of this finding in education, reading and other areas, which still remain to be explored.

The experiment itself involved a task requiring right-handers and left-handers to relate to an image, which was composed of smaller images, for example, a large letter H, made up of small H letters. These images are called compound letters. If we are asked to focus upon the large H, the right cranial hemisphere will be dominant, while if we are asked to focus on the small H letters, the left hemisphere will be dominant.

Research

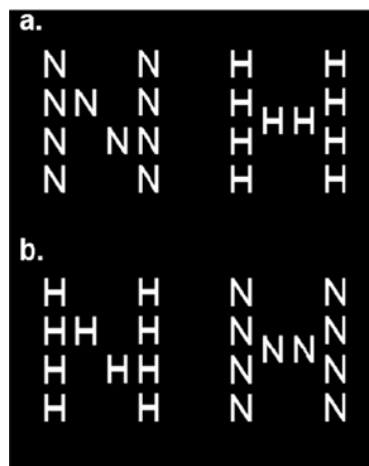
Further Surprising Research and a Hypothesis:

Left-Hemisphere Perception of Detail May Be a Step More Advanced

The complexity of the visual perception function came to light when the researchers examined a patient with a brain lesion involving damage in both hemispheres, who was nearly blind, and who, focusing on these images, could identify the small H's, but could not interpret the large H at all. No global function remained at all, while some local function (in his left hemisphere) remained.

In the next phase of the experiment, a large letter was presented just before the compound letter, which resulted in highlighting and emphasizing the large H. Under those circumstances, the patient did identify the global aspect of the compound figure (i.e. the large H) and accomplish the global interpretation, which he had repeatedly failed to do previously. This led to the hypothesis that the dichotomy between the right and left hemispheres was not so simplistic and that there may be other factors at play.

The hypothesis of the researchers was that the left hemisphere of the brain perceives the local picture, not because it is unable to see the global picture, but because the local elements of the picture are less salient and thus could be processed only in a controlled attentive mode. The global picture is the noticeable, obvious one, which is the first to meet the eye. And while the right hemisphere is 'satisfied' with that, the left hemisphere goes beyond to interpret the less obvious stimuli, which requires a greater effort. From that perspective, the perception of the left side of the brain is more advanced and sophisticated.



Some aspects of this complex issue were discovered by accident in the course of their research. The researchers set out to examine what would happen in the case of magnetic stimuli applied to parts of the brain (a technique known as transcranial magnetic stimulations – TMS – which creates a brief disruption of normal brain activity induced by magnetic pulses focused on a specific region). The stimulation was applied to the right side and subsequently to the left side of the brain to determine the effect upon their global or local perception. As it happened, some of the participants were right-handed and some left-handed. And the results of the disruption were quite different for each group.

While the right-handed group reacted as anticipated – the disruption to the right side of their brain interfered with their global perception, the left-handed group surprisingly reacted just the opposite. Disruption to the right side of the brain of left-handed participants

resulted in disruption to their local perception, while disruption to the left side of the brain damaged their global perception. It appears that the reversal which exists in brain activity of lefties and righties in the semantic sphere happens in the area of visual perception as well. This discovery generated a great deal of interest in professional circles.

The research also generated curiosity, in light of the new hypothesis that the essence of the left hemisphere activity is to perceive the detail, overcoming the more obvious global stimulus and requiring a higher quality control process.

Says Dr. Lilach Shalev. “Until now, brain research has always approached man as having universal brain function. Now, in view of this research, it seems the time has come to pay more attention to sub-groups, like right-handed and left-handed, and how their specialization finds expression in brain activity. Furthermore, if this hypothesis is correct, the activity of the left hemisphere is not a local perception activity, but a higher level of perception, which can pick up details beyond the obvious, which are likely to influence attention. It is likely that there are differences between the right-handed and the left-handed with regard to issues of attention, and not only in a semantic context. Other research has indicated the involvement of the right hemisphere as the center of specialization of attention. Here, an important attention function appears on the left side. This is certainly an issue to be researched.”