

Brain Hemispheres, Emotions and Autism Spectrum Disorder

Belgium Study Discovers Interesting Results

We all know that we have two sides of our brain that work in conjunction with each other. And we often hear people say "I'm a left-brained person" or "I'm a right-brained person". It is often true that one side or the other seems to be dominant in most people. For instance a successful accountant probably is left-brain dominant and an artist is most likely right brain dominant. But what about our emotions and our emotional reactions? Is it fair to say they are only being processed on one side or the other?

The January 2003 issue of "Neuropsychology," published by the American Psychological Association, has an interesting article about a study done in Belgium by psychologists interested in how emotions are processed by our minds. They actually looked at blood flow velocity, via ultrasound equipment, to the brain and concluded that in dealing with emotions we are very much whole-brained. The left side focuses on the "what" of the emotion and then the right side goes to work on the "how" as in, how it feels.

At Ghent University, Guy Vingerhoets, Ph.D., Celine Berckmoes, M.S., and Nathalie Stroobant, M.S., knew that the left-brain is dominant for language, and the right-brain is dominant for emotion. But what happens when the brain is processing emotional language? Participants in the study, while hooked up to the ultrasound machines, were asked to listen to a set of messages that had been recorded for the study. The sentences were ones that actors spoke in two ways. One way was factual without inflection and the other way was with the appropriate emotional tone for the emotion being expressed. For instance, "She loved the flowers he sent her," was said once without inflection and once with the emotional tone of happiness and joy.

The ultrasound revealed much. When the sentence was said without emotion the listeners focused on the words being said and identified the emotion accurately. The left-brain function picked up and showed increased blood flow and activity. The left-brain processed what the emotion was and correctly identified it. But when the same sentence was repeated with feeling and emotion an interesting thing happened. The right-brain activity increased as expected BUT the left-brain did not cease or slow its activity. The brain as a whole processed what the emotion was and what the proper reaction to that emotion would be. It took both sides of the brain to correctly connect with that specific emotion.

What could this mean in terms of autism spectrum disorders? Consider a condition such as autism. People with autism consistently have problems with processing other people's emotions and in addition to that, they struggle with conceptual issues. That is definitely a sign of right-brain malfunction either in how the brain is processing the information or in the ability of the Corpus Callosum to network the two sides together. Thus when the tone of voice or inflection comes up, the right-brain may not be rising to the occasion to work in tandem with the already functioning left-brain.

"Understanding emotional prosody," says Vingerhoets, "appears to activate right hemispheric brain regions." However, the left-brain stays active to categorize or label the emotion -- as befits its dominance in language processing. "Even if you pay attention to the 'how' information," says Vingerhoets, "you can't help hearing the

semantic content, the 'what' of the message. We do this all the time; we are trained in it."

Obviously this has tremendous clinical implications for many issues such as tumors, lesions, strokes and other brain disorders. As Vingerhoets said, we are trained in it, but we are trained by observation and as we grow up from children to adults. A child, who is autistic and is unable to understand the subtle clues given by tone of voice because the right brain is not functioning as well as it could, is at a tremendous disadvantage in communicating. The receptive part of communication will be hampered by the inability to notice and understand the finer nuances in speech and the expressive part will be unable to project concepts via emotional content in the speech.

That also brings up the question about the unique ability of many people with autism as far as artistic and musical ability. If the right brain is not increasing its functioning, how does that explain so many painting, playing music, drawing and engaging in other activities that involve right-brain activity? Perhaps the problem will be found in the Corpus Callosum. The connective tissue that unites right and left-brain function may be impaired in some way as well. This would also be interesting when taken in conjunction with the fact that 75% of autistics are male. The point of study here would be that the Corpus Callosum in males is smaller and less functional than in females. Is it possible that this tissue within the brain deserves a study that is more intensive?

Much more research will need to be done but it is clear that we are more than a right hemisphere and a left hemisphere. We function as a whole as the two halves of us ratchet up their functions to mesh with each other. And that is exciting; no matter what side of the brain you think with!