Study shows left side of brain more active in immoral thinking

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(Medical Xpress) -- Because the brain is so complex, researchers are forced to devise all manner of different types of tests in trying to understand not just how it works, but which parts of it do what. To that end, a diverse group of scientists from several universities across the U.S. got together to work on the problem of which parts of the brain, if any specifically, are involved in analyzing and making moral judgments. To find out, or at least learn more, they devised three experiments meant to test the busyness of the brain, measured by blood flow, to certain regions, when presented with immoral situations. They have published the results of what they found in the journal *Frontiers in Evolutionary Neuroscience*.

The idea behind all three experiments was to present volunteers with material that is generally believed to be immoral while watching blood flow patterns in their brains using fMRI, as compared to what happens when moral or neutral material is viewed.

In the first study, volunteers were told that they would be engaging in a memory test. They were then shown a series of statements, followed by another series of statements after that. During the second series they were asked to press a button to indicate if the statement they were being shown had been among those shown in the first series. The statements shown were divided into four classes: pathogen related (non-sexually gross stuff), incestuous acts, nonsexual immoral acts and neutral acts.

In the second study, volunteers were shown three types of statements in random order: 50 examples describing acts that most people think of as immoral, 50 statements that most think of as pro-moral (morally good) and 50 statements that most people think of as neutral.

And finally, in the third study, volunteers were shown three types of pictures in random order: immoral, non-moral (negative without morality), and neutral.

After analyzing and normalizing the data, the researchers found that the left hemisphere of the brain showed increased blood flow in response to immoral stimuli throughout all three studies, while the right did not. No such pattern was found for the neutral or pro-moral tests. They also found that while each of the three tests tended to light up specific areas of the left hemisphere in the scanned images, there was also quite a bit of overlap between those participating in the three different studies.

The research team isn't making any declarations regarding their results other than suggesting that it appears the left side of the brain appears to be more involved in immoral processing than the right. They also suggest

the brain might have evolved to work this way to avoid duplication in processing and to increase efficiency.

More information: Cope LM, Schaich Borg J, Harenski CL, Sinnott-Armstrong W, Lieberman D, Nyalakanti PK, Calhoun VD and Kiehl KA (2010) Hemispheric asymmetries during processing of immoral stimuli. *Front. Evol. Neurosci.* 2:110. doi: 10.3389/fnevo.2010.00110 (full text available here)

Abstract

Evolutionary approaches to dissecting our psychological architecture underscore the importance of both function and structure. Here we focus on both the function and structure of our neural circuitry and report a functional bilateral asymmetry associated with the processing of immoral stimuli. Many processes in the human brain are associated with functional specialization unique to one hemisphere. With respect to emotions, most research points to right-hemispheric lateralization. Here we provide evidence that not all emotional stimuli share right-hemispheric lateralization. Across three studies employing different paradigms, the processing of negative morally laden stimuli was found to be highly left-lateralized. Regions of engagement common to the three studies include the left medial prefrontal cortex, left temporoparietal junction, and left posterior cingulate. These data support the hypothesis that processing of immoral stimuli preferentially engages left hemispheric processes and sheds light on our evolved neural architecture.