情動刺激の処理過程には性差がある（Abstract# LL-NR4011-B06）

fMRIの結果、快不快な刺激に対する脳の反応は男女で異なることが示された

fMRI shows men and women's brains respond differently to positive and negative stimuli

機能的磁気共鳴画像（fMRI）を用いて脳の活性化を調査した結果、快不快な刺激に対する脳の反応は男性で異なることが明らかにされた、と2009年Radiological Society of North America学会（RSNA 2009）で発表された。研究者らは、18～36歳の右利きのボランティア40人（男性21人、女性19人）を組み入れた。彼らは、明らかな情動状態を喚起するようにデザインされた様々な物体および通常の生活の映像を見ている間にfMRIを施行された。不快なイメージを見ている間、女性は、疼痛および歓喜の中心を含む脳皮質へまたここから知覚情報を伝達する左視床の強くより広範な活性化を示した。男性は、体全体の生理的状態を判断し行動を引き起こす主観的な感情を生み出す左島皮質の活性化を示した。快適な映像を見ている間、女性は、聴覚処理および記憶に関与する右上側頭回の強く広範な活性化を示した。男性は視覚処理に関連する両側の後頭葉に強い活性化を示した。これらの差は、女性は快適な刺激を広範な社会場面において解析し快適な映像と特別な記憶を関連付ける可能性が示唆される。逆に男性の反応はより知覚的である。

Full Text

Researchers using functional magnetic resonance imaging (fMRI) to study brain activation have found that men and women respond differently to positive and negative stimuli, according to a study presented at the 2009 annual meeting of the Radiological Society of North America (RSNA).

"Men may direct more attention to sensory aspects of emotional stimuli and tend to process them in terms of implications for required action, whereas women direct more attention to the feelings engendered by emotional stimuli," said Andrzej Urbanik, M.D., Ph.D., chair of Radiology at Jagiellonian University Hospital in Krakow, Poland.

For the study, Dr. Urbanik and colleagues recruited 40 right-handed volunteers, 21 men and 19 women, between the ages of 18 and 36. The volunteers underwent fMRI while viewing pictures from the International Affective Picture System (IAPS), a widely used, standardized testing system comprised of several thousand slides of various objects and images from ordinary life designed to evoke defined emotional states. The images were displayed in two runs. For the first run, only negative pictures were shown. For the second run, only positive pictures were shown.

While viewing the negative images, women showed decidedly stronger and more extensive activation in the left thalamus, which relays sensory information to and from the cerebral cortex, including the pain and pleasure centers. Men exhibited more activation in the left insula, which gauges the physiological state of the entire body and then generates subjective feelings that can bring about actions. Information from the insula is relayed to other brain structures involved in decision-making.

"The brain activation seen in the women might indicate stronger involvement of the neural circuit, which is associated with identification of emotional stimuli," Dr. Urbanik said. "The more pronounced activation of the insular cortex in the men might be related to the autonomic components, such as elevated heart rate or increased sweating, that accompany watching emotional material."

"In men, the negative images on the slides were more potent in driving their autonomic system," Dr. Urbanik said. "This might signal that when confronted with dangerous situations, men are more likely than women to take action."

While viewing positive images, women showed stronger and more extensive activation in the lright superior temporal gyrus, which is involved in auditory processing and memory. Men exhibited stronger activation in the bilateral occipital lobes, which are associated with visual processing.

Dr. Urbanik believes these differences indicate that women may analyze positive stimuli in a broader social context and associate the positive images with a particular memory. Viewing a picture of a smiling toddler might evoke memories of a woman's own child at this age. Conversely, male responses are more perceptual.

"Positive images are devoured by mens' visual and motivational systems," Dr. Urbanik said.

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TOPICS