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Hormones and brain activity: Study sheds light on facial preferences

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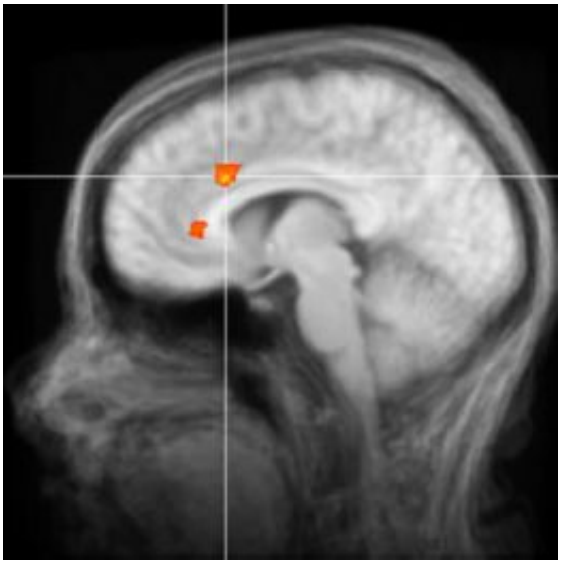

The red marks an area where researchers observed increased activation in response to masculinized compared to feminized faces during the follicular phase, which is closer to ovulation and higher fertility time. This activation is located in the anterior cingulate cortex, which is a region involved in decision-making, specifically the evaluation of potential reward and risk.

(PhysOrg.com) -- Scientists have long known that women's preferences for masculine men change throughout their menstrual cycles. A new study from Indiana University's Kinsey Institute is the first to demonstrate differences in brain activity as women considered masculinized and feminized male faces and whether the person was a potential sexual partner.

The researchers identified regions of the brain that responded more strongly to masculine faces and demonstrated that differences between masculinized and feminized faces appeared strongest when the women were closer to ovulating.

The study, published in an online edition of the journal *Evolution and Human Behavior*, sheds light on the link between women's hormone levels and their brain responses to masculinized versus feminized male faces, potentially offering insights into female mate preferences. The current study points towards enhancements of both sensory discrimination and risk processing around ovulation in response to masculine faces as possible mediators of women's mate preferences.

"One area of the brain in which we observed a difference in activation in response to masculinized versus feminized faces -- specifically during the follicular phase -- was the anterior cingulate cortex, which is a region involved in decision-making and the evaluation of potential reward and risk," said neuroscientist Heather Rupp, research fellow at the Kinsey Institute for Research in Sex, Gender and Reproduction. "Activation in this region has been previously reported to correlate with 'high risk' nonsocial choices, specifically monetary risk, so it is interesting that it is observed to be more active in response to masculinized male faces, who may be both riskier but more rewarding to women."

Previous studies have shown that women's sexual preference for facial characteristics vary depending on their menstrual phase. These fluctuating preferences are thought to reflect evolutionarily founded changes in women's reproductive priorities. Around the time of ovulation women prefer more masculinized faces -- faces with features that indicate high levels of testosterone. These facial cues predict high genetic quality in the male because only such males can afford the immune-compromising effects of testosterone. Testosterone may be costly for the males' mates as well because high testosterone levels also

are associated with high rates of offspring abandonment.

Around the time of ovulation, a female's preference apparently shifts from avoiding negligent parenting to acquiring the best genes for her offspring. At other points during the cycle, women will prefer more feminized male faces, as they might signal a higher willingness of the males to invest in offspring.

Rupp and her team set out to explore the link between hormone levels and brain responses to masculinized versus feminized male faces. Pictures of 56 male faces were masculinized and feminized using standard computer-morphing software. Twelve heterosexual women, averaging about 25 years old, were tested during the follicular phase, which is closer to ovulation and higher fertility time, and the luteal phases of their menstrual cycles. Before each test session their blood was collected for hormone analyses. While brain activity was measured using functional Magnetic Resonance Imaging, women viewed the masculinized and feminized male faces, indicating their interest in the man depicted as a potential sexual partner.

Researchers found differences in brain regions related to face perception, decision making and reward processing that responded more strongly to masculinized than feminized faces, suggesting that "neural activation in response to face stimuli is sensitive to facial masculinization, even in the absence of differences in subjective ratings." Differences between masculinized and feminized faces appeared strongest during the follicular phase, closer to ovulation.

Provided by Indiana University