Mating preferences in phases of the natural menstrual cycle with a low probability to conceive have been associated with lower interest in characteristics promising genetic benefits but increased search for safety and future security. We hypothesized that this effect would also be evident under oral contraception and may therefore alter neural processing of monetary rewards as a proxy for potential safety. Our aim was to assess the activation of reward-related brain areas using a monetary incentive task in women with functional MRI (fMRI). We compared fMRI activation of 12 young women taking oral contraceptives with 12 women with a natural hormonal cycle in their follicular phase during the expectation of monetary rewards. Women under hormonal contraception who have already shown decreased anterior insula activation upon erotic stimulation in a previous study of the same sample now showed enhanced activation during monetary reward expectation in the anterior insula/inferior lateral prefrontal cortex ($t=2.84; P<0.05$) relative to young normal cycling women in the follicular phase. Our finding supports the notion that the switch in mating preferences related to different hormonal states in women is mirrored by a switch in the stimulus-dependent excitability of reward-related brain regions. Beyond highlighting hormonal effects on reward processing, our data underline
the importance of monitoring hormonal states in fMRI research in women.

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