

Modelling the role of the brain in orgasm

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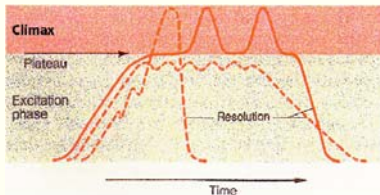
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Background



Masters & Johnson's summary of the human sexual response

Climax involves:
reproductive tract: e.g. ejaculation - readily studied
viscerosomatic responses: e.g. HR, BP - readily studied
brain: orgasm - no conceptual framework exists

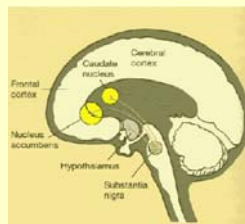
Methods

Data were collected from published investigations. Human subjects of both sexes have been recorded during orgasm achieved under laboratory conditions. Recording techniques included EEG^(2,3) (electroencephalograms), MRI⁽⁶⁾ (magnetic resonance imaging), regional cerebral blood flow (rCBF) monitored by SPECT⁽⁶⁾ (single positron emission computed tomography) and PET⁽⁴⁾ (positron emission tomography).

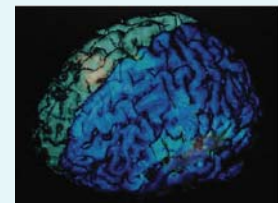
Question: What elements of brain function contribute to orgasm?

A model or conceptual framework is needed to permit hypothesis testing. Applications include impacts of brain trauma, side effects of mood stabilising drugs, treatment of sexual dysfunctions.

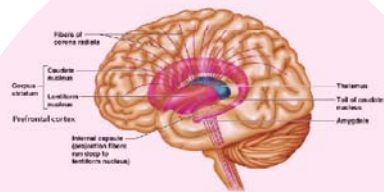
Results



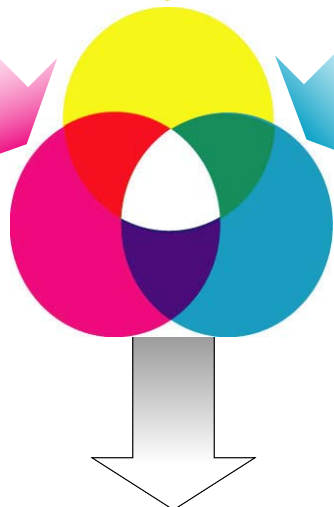
Pleasure:
coded in basal forebrain especially ventral tegmental area and its dopaminergic projection to the "reward centres" of the septal nuclei & nucleus accumbens
evidence from:
+ EEG⁽²⁾
+ PET⁽⁴⁾



Euphoria:
probably coded by asymmetric cortical activation
evidence from:
+ shift from symmetry to asymmetry during orgasm (EEG^(2,3); rCBF using SPECT⁽⁶⁾)
+ mania of bipolar disorder⁽⁵⁾
+ rebound after induced depression⁽¹⁾
but there is a paradox
* shift to **right** dominance with orgasm but **left** dominance with mania
** this paradox needs to be investigated**



Emotion:
coded in limbic association area especially prefrontal cortex & cingulate gyrus
evidence from:
+ EEG⁽²⁾
+ MRI⁽⁶⁾
+ rCBF using PET⁽⁴⁾ or SPECT⁽⁶⁾



EMOTION + PLEASURE + EUPHORIA = ORGASM

Conclusion

The human sexual response involves a mixture of emotion, pleasure and euphoria in different proportions, hence each experience of orgasm is different.

This variability is probably achieved by varying intensities of response in the prefrontal cortex, basal nuclei, and cortical asymmetry.

References

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- Illustrations prepared by modifying figures from Mariëb (2004, Pearson Education); Schmidt & Thews (1987, Springer-Verlag); Rhoades & Pflanzer (2003, Thomson).