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INTRANASAL OXYTOCIN MODULATES HUMAN SOCIAL BEHAVIOUR AND CENTRAL AND PERIPHERIC NEUROCORRELATES

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Grant 292/16

Background: Trust is a mentalizing process which makes human relationships, social organizations and political and economical systems, possible. Oxytocin (OT) is a neuromodulator well known to facilitate maternal and pair bonding. Consistently, in humans, exogenous intranasal OT enhances mentalizing that facilitates trusting behaviours: from the affective-perceptual, e.g. facial emotion recognition, eye-to-eye gaze, to a higher-order cognitive-evaluative dimension, e.g., social learning, generosity, cooperation and particularly, trust. However, the underlying psychophysiology of OT's effects is unknown.

Aims: We aimed to understand how oxytocin affect the psychophysiology of cognitive processes behind trust, such as empathy, cooperation and social salience. This research is key to advance social psychology and neuroscience and to rationally improve our etiological models of psychiatric social symptoms.

Method: For this, we have conducted, in humans, a series of studies involving placebo-controlled double blind administration of intranasal oxytocin during a reinforcement learning and salience task, a social dilemma (including with sexual objectification targets), and emotional video viewing (including in people with psychosis) with brain imaging, pupillometry, eye-gaze tracking and/or electroencephalography recording.

Results: This project has allowed us to show that:
1. OT's effects on neural activity may exist irrespective of fear-related social- or reward-contexts;
2. Sexualization impairs cooperative behavior towards women opponents and that this pattern – as well as the associated P300 ERP latency - is counteracted by intranasal oxytocin;
3. Oxytocin's effect on central and autonomic neurocorrelates of salience attribution (as measured via pupillometry and eye-gaze) depend on both socialness and reward value of stimuli;
4. Oxytocin increases the spatio-temporal salience of social interactions measured via eye-gaze during free-viewing;
5. Oxytocin normalizes the synchronization of brain activity across individuals with psychotic disorders during emotional video viewing;

Conclusions: We have thus furthered the characterization of OT's role in both autonomous and central neurocorrelates of cognitive and emotional empathy and social salience attribution – both in healthy and psychosis; and in the context of sexual objectification.

Keywords: Empathy, Trust, Cooperation, Salience, EEG, fMRI, Pupillometry, Eye-gaze

Publications:

Santiago, A. F., Kosilo, M., Cogoni, C., Diogo, V., Jerónimo, R., & Prata, D. (2024). Oxytocin modulates neural activity during early perceptual salience attribution. Psychoneuroendocrinology, 161, 106950. https://doi.org/10.1016/j.psyneuen.2023.106950

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