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Evaluating self- vs. other-owned objects: The modulatory role of oxytocin

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ABSTRACT

Previous research has shown that the neuropeptide oxytocin promotes various prosocial sentiments, such as trust, generosity and cooperation. Here we investigate whether it plays a role in evaluating self- vs. other-owned objects. Brain potentials were recorded in participants who judged the ownership of objects that were described in either positive or negative terms. Results showed that self-owned objects framed by positive adjectives elicited more positive-going brain responses than those framed by negative adjectives, irrespective of oxytocin or placebo being administrated. Negatively described other-owned objects evoked more positive-going responses than positively described other-owned objects, but the opposite pattern was found with the administration of oxytocin. Thus, oxytocin abolishes other-derogation but does not affect self-enhancement in object evaluation, consistent with the proposal that oxytocin enhances affilliative and approach motivations during social interaction.

et al., 2008; Kosfeld et al., 2005), generosity (Zak et al., 2007) and cooperation (Declerck et al., 2010). For instance, in a seminal study, Kosfeld et al. (2005) demonstrated that intranasal administration of oxytocin substantially increased trust in a social–economic game, although the positive effect of oxytocin on trust-related behavior is constrained by various social or situational factors (De Dreu et al., 2010; Mikolajczak et al., 2010). The present study aimed to extend this line of research by investigating whether brain responses to the ownership of objects would be modulated by the administration of oxytocin. Specifically, we investigated whether the administration of oxytocin would affect individuals' self-enhancement motivation in evaluating self-owned objects and affect individuals' attitude toward the objects owned by others.

To this end, we used a $2 \times 2 \times 2$ mixed design, with the between-participant factor referring to the treatment (oxytocin vs. placebo) and the within-participant factors referring to the ownership of the objects (self vs. other) and the valence of the priming adjectives (positive vs. negative) preceding the names of the objects. Before the execution of the formal experiment, we asked each participant to image a scenario in which he was assigned three objects while an unspecified other person was assigned another three objects. In the formal experiment, we used positive or negative adjectives (e.g., *clean*,e.0 0 -.0002 262.2.0006 714.025 Tm ( )Tj /F1 1 Tf 7.9701 0 0 72 0 5 220.0094 536.1953 Tm ((e.g.,)Tj /F2 1

Fig. 1. ERP responses at the midline Fz, Cz and Pz, time-locked to the onset of object nouns in the placebo (left panel) and oxytocin (right panel) group.

were baseline-corrected by subtracting from each sample the average activity of that channel during the baseline period. All trials in which EEG voltages exceeded a threshold of ±80 μV during recording were excluded from further analysis. The EEG data were low-pass filtered below 30 Hz.

Based on visual inspection of the ERP waveforms (Fig. 1), we selected the ERP responses in the 300–1000 ms time window for statistical analysis. The Greenhouse–Geisser correction for violation of the assumption of sphericity was applied where appropriate.

3. Results

3.1. Behavioral results

Trials in which the participants did not respond within 2 s or responded incorrectly, and trials in which the reaction times (RTs) exceeded three standard deviations from the mean in each experimental condition were excluded from data analysis. About 4.21% of the total data points were lost due to these procedures.

A 2 × 2 × 2 mixed ANOVA on the RTs revealed a significant main effect of ownership, $F(1,42) = 20.10$, $p < 0.001$, suggesting that the responses to self-owned objects (mean ± SE, 527 ± 21 ms) were significantly faster than to other-owned objects (548 ± 21 ms). Although the behavioral responses lagged behind the presentation of the stimuli, this finding is consistent with previous studies showing that individuals generally respond faster to self-related items such as one's own names, phone numbers, or face photos (Greenwald and Farnham, 2000; Ma and Han, 2010). No other effects were found in RTs.

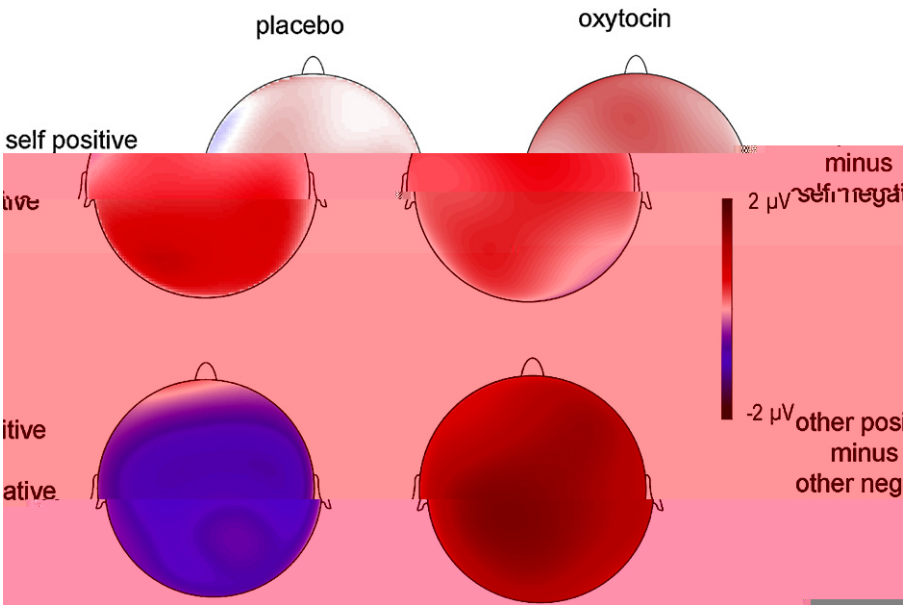

Fig. 2. Topographic maps for the sustained positivity.

3.2. ERP results

Mean amplitudes for the ERPs in the 300–1000 ms window

the more positive responses for positively framed self-owned objects than for negatively framed self-owned objects are congruent with the self-enhancement motivation implicated in object evaluation.

The intriguing finding was that oxytocin had no obvious effect upon the brain responses in evaluating self-owned objects. This finding appeared to be different from De Dreu et al. (2010, 2011) in which the effect of oxytocin on intergroup (racial) bias was mainly

other-owned objects evoked more negative-going responses than negatively described other-owned objects, but the opposite pattern was found with intranasal oxytocin. These findings suggest that oxytocin abolishes other-derogation but does not affect self-enhancement in object evaluation, consistent with previous studies showing that oxytocin enhances affilliative and approach motivations during social interaction.

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