Gender Differences in Oxytocin-associated Disruption of Decision Bias During Emotion Perception

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Introduction

Oxytocin is associated with differences in the perception of and response to socially mediated information, including facial expressions. Although oxytocin is widely believed to increase “accuracy” of emotion perception, across studies oxytocin’s effect on emotion perception has been inconsistent.

Methods

• 40 participants (age: M=44.0 ± 10.32 [SD] years, 45% women) were given 30 IU intranasal oxytocin (n=22, 9 women) or placebo (n=18, 7 women). The randomized, double-blind administration occurred 70 min prior to task.
• Faces that depicted expressions ranging from relaxed to strongly scowling comprised two categories: “angry” (targets) and “not angry” (foils). Stimulus duration was 750 ms.
• Uncertainty was implemented by creating distributions of targets and foils which shared exemplars. The distributions overlapped on the perceptual domain: targets were M = 60 ± 15% (1 SD) scowl intensity, foils were M = 40 ± 15% (1 SD) scowl intensity.
• Risk was created by earning or losing points for correct vs. incorrect categorization of targets and foils (i.e., categorizing a target as “not angry” cost more points than categorizing a foil as “angry”), with a target-foil base rate = 0.6 (i.e., 60% of trials were targets).
• Over 230 trials, participants attempted to earn as many points as they could, answering the on-screen prompt “Is this person angry?”.

We used a utility-based signal detection approach (Lynn et al. 2012) to frame emotion perception as a risky, uncertain decision. We examined the effects of oxytocin on an emotion perception task requiring perceivers to effectively account for risk by optimizing their response bias.

We found a significant interaction of drug and gender on response bias (ANOVA, F(1,32)=4.1, p<0.049, partial n²=0.11, power=0.51), without main effects, controlling for baseline perceived stress (Perceived Stress Scale) and trait anxiety (State Trait Anxiety Index, Trait Total Score) in this non-psychiatrically ill sample.

Men given oxytocin were less influenced by cost and base rate, exhibiting a loss liberal (i.e., worse) response bias, than men given placebo (F(1,20)=5.0, p=0.037, partial n²=0.20, power=0.57). Oxytocin did not influence women’s performance (F(1,12)=0.6, p>0.4, partial n²=0.04, power=0.11).

Oxytocin may impair men’s ability to optimally adapt emotion perception (e.g., judgments of anger from faces) to differences in risk and uncertainty that characterize different social contexts.

References


Lynn, E. S., Zhang, X., Barratt, L. D. 2012. Affective state influences perception by affecting decisions that are underpinned by both bias and sensitivity. Emotion, 12, 735-738.


