Does Oxytocin Affect Trust?

Oxytocin is a hormone that is produced in the pituitary gland, promoting feelings of contentment. This is more apparent in females than males due to oestrogen increasing the secretion of oxytocin. Another term for this hormone is the 'Love' hormone because it helps in encouraging bonding and attachment in both genders. This essay will explore the evidence for the effect oxytocin has on trust. Evidence for its impact on trust will be addressed through studies with the issues of bias also being considered.

600 student participants were used for Nishina *et al. (*2018) study on the association between the oxytocin receptor gene and amygdala volume on additional trust. The study consisted of 8 phases with a variety of economic games and cognitive experiments such as by answering questions found in large-scale surveys like the General Social Survey. Researchers found that OXTR rs53576 genotypes are affiliated with the volume of the left amygdala. It was shown that smaller left amygdala volumes were present in men with the GG genotype suggesting there are more oxytocin receptors present in the amygdala unlike in men with the AA/AG genotype. In contrast it was found that women with the AA/AG genotype had a smaller left amygdala volume, this difference may be due to the difference in allocation of oxytocin receptors in the amygdala. Earlier studies have brought about the conclusion that the frequency of the GG genotype is less frequent in East Asians than in Americans with the AA genotype being more frequent. With this study concluding the GG genotype is associated with elevated levels of additional and behavioural trust in men, this would predict that level of trust is higher in American men. Therefore, suggesting the possibility of culture coevolving with OXTR, suggesting living in an individualist or collectivist culture can affect one's trust levels. Although, this generalisation may not be viewed as valid as additional trust is a small aspect of human trust, so in future research it is necessary to consider various aspects e.g., trust behaviour in real life.

A similar study was conducted by a different researcher investigating the genetic variations of the oxytocin receptors and its impact on promoting human trust behaviour. Focusing on OXTR genes' association with trust behaviour in real life by using 108 'healthy' male student participants (all European Americans).There were 2 laboratory-based experiments: an investment game (which measured trust and trustworthiness behaviour) and lottery game (which measured risk behaviour). The investors in both the trust and risk experiments faced objective risks which assured that trusting behaviour is not mixed with risk behaviour. To account for possible confounding variables participants completed psychological control measures after the experiments e.g., theory of mind ability in which the RMET multiple-choice test was used (Baron-Cohen *et al.* (2001)). For data analysis, the genotype effects were found using the relative frequencies of the investor's transfers in the trust experiment and risk experiment. Then the same process was followed for the trustee's transfer and back transfer levels, after which a Pearson Chi-squared test was performed which compared the frequencies between both the groups. The researchers concluded that a common occurring genetic variation in the OXTR gene is associated with trust behaviour because the participants with the AA/AG genotypes showed lower trust behaviour as well as lower dispositional empathy. However, the results of both these studies contrast with those of Apicella *et al.* (2010) who considered trust behaviour to be the total sum of transferred money while both Nishina *et al.* (2018) and Krueger *et al. (*2012) considered the trust level to be determined by the frequency of money given to trustees. Although Krueger *et al. (*2012) investigated only male-male pairs (unlike Apicella *et al. (*2010) due to the evidence that female-female pairs show lower trust levels than male pairs, though this did decrease generalisability of their findings. Which may be reasoning for why Apicella *et al.* (2010) did not find an association between OXTR and human trust.

In a study on whether oxytocin makes females/males less forgiving following the betrayal of trust, Yao *et al.* (2014) used 94 participants all who completed several questionnaires beforehand (e.g., the empathy quotient). Using a double-blind placebo-controlled design enabled selection bias to be removed as well as confounding variables. Subjects were either given a single dose of OXT or PLC before starting the investment game where the investor had 4 partners. To induce trust betrayal 3 did not send any MU back to investor in the first round. Feedback on the trustee's decisions was sent back to investor, the participant (investor) then completed a benevolence scale to rate the effect of trust violation followed by another dose. Trustees 'thoughts' were presented to investor before the second round of the game, each being one of the conditions. The financial compensation condition ('I decide to give

amount that making both banks equal MU back to you'), apology condition ('I realise that my offer to you was not appropriate, and I feel bad about this') and the fair or nothing condition where the trustees would say 'I decide to do nothing.' Yao *et al.* (2014) found that OXT has no overall impact on trust restoration, although it did show a gender effect. Females had significantly reduced trust repair following betrayal after receiving OXT with the financial compensation strategy being the least effective. Therefore, oxytocin may make females that are high in forgiveness less affected by repair tactics meaning that oxytocin may act to increase trust behaviour and act as an aversion to trust betrayal. It should be considered that all participants were 'healthy' (none of the subjects took any medication or had neurological problems/psychiatric illness). Future studies would need to explore oxytocin on trust restoration using participants with social emotional disorders such as autism and schizophrenia to solidify our understanding of the effect of oxytocin on trust.

Research shows that Oxytocin does affect trust levels because of its impact on the amygdala which is related to emotional processes. However, it has been shown That there is a sample bias towards inclusion of other cultures and those dealing with psychological disorders, meaning the data has less population validity and the generalisability of the results is limited. Although, more research is needed on oxytocin's relationship with trust, using a wider variety of ages and people with emotional disorders (like Park *et al.* (2010).

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