

# #5 Daniel Tsai Explain how one hormone affects human behavior.

Hormones are chemicals in our body that regulate long term processes such as growth, metabolism, digestion, and reproduction. A hormone is released into the bloodstream by an endocrine gland and travels with the bloodstream until the destination is reached. Moreover, hormones can only affect cells that have the <sup>specific</sup> ~~correct~~ receptors for it. These cells are called target cells. When a hormone binds with a cell a sequence of changes occur in the cell, and some of these changes are genomic like gene activation or gene changes. Hormones are strongly linked with human behavior as hormones are able to affect the way humans act. For example, ~~when~~ <sup>hormones</sup> a can cause the probability of a certain behavior happening to be increased when an external stimuli is presented. One specific hormone that will be further investigated in this work is oxytocin. Oxytocin is a hormone that is produced in the hypothalamus and released into the bloodstream by the pituitary gland. Oxytocin has the ability to influence sexual reproduction, childbirth, and social bonding. Furthermore, oxytocin is said to ~~have~~ <sup>create</sup> a warm and fuzzy feeling and many studies have shown that it can reduce stress and anxiety. Oxytocin has also been named the "cuddle hormone" as it can increase the affection between couples. ~~How~~ However, it is important to keep in mind that oxytocin acts differently in males and females as the amygdala that processes them work differently. The role of oxytocin on human behavior has been demonstrated and sendal by many ~~other~~ experiments that have found interesting results.

One study that studies the role of oxytocin on human behavior is Scheele et al. (2012). The aim of this study was to investigate how oxytocin ~~promotes~~ promotes fidelity in humans. Fidelity is the loyalty of one human being to their partner. The experiment consisted of 86 heterosexual ~~participating~~ male participants, with some being

single and others being in a relationship. The participants were then separated into two groups with one receiving a dose of oxytocin and the other receiving a dose of a placebo. Then all the participants were given two tasks they had to complete. The first task, the participants were instructed to do was to stand on one side of a room while an attractive female stood on the other side. Then the participants were told to slowly approach the female and stop where they felt comfortable. In the second task, the participants were shown a series of 4 different types of pictures: positive social pictures, positive non-social pictures, negative social pictures, and negative non-social pictures. Then the participants were instructed to pull a lever when they liked the picture. The results showed that for single men, ~~participants~~ the oxytocin did not really have an effect on their answers. However, for males in a relationship the oxytocin caused them to remain at a further distance from the female and pull the lever more slowly than the ~~was~~ placebo group. From this study it can be concluded that oxytocin helps males in a relationship to be more loyal to their partner. Although remaining at ~~at~~ a further distance seems like an insignificant thing, it clearly shows how participants are less willing to get close to a female. The ~~the~~ study clearly shows how oxytocin will affect human behavior as the dose of oxytocin promoted fidelity in the male participants. On the contrary, one major limitation of this study is that the population validity is relatively low. This is because there is an absence of female participants in the study. The need for both genders in a study on oxytocin is especially important because this hormone acts differently in the two genders as mentioned before. Therefore, this study can be improved by also using female participants to see how oxytocin affects their behavior. There are still several points to this study as it has a good and internal validity because the results clearly show

to the aim, one final critique of this study is that the external validity is not the greatest. The tasks the participants were instructed to do were quite different from a real life situation, so researchers can not be <sup>completely sure</sup> how oxytocin will act in real life. In conclusion, ~~regarding~~ the study of ~~the~~ Scheele et al (2012) is a study that clearly shows a hormone, oxytocin, affecting human behavior by promoting fidelity in humans.

They could make the study better by using situations that are more similar to real life.

Hormones are chemical messengers in the human body that are secreted as a response to stimuli and emotion. Unlike neurotransmitters which are stationary in the body, hormones are part of the endocrine system, meaning they are secreted by different glands and can then be transported around the body via the blood stream or circulatory system. Within the brain, the thalamus (in the center of the brain) deals with the chemical messages being sent by the hormones and then allows neurotransmitters to also send electric and chemical signals around the body, suggesting that the nervous system and endocrine system work hand in hand. Some examples of hormones in the body are insulin, cortisol and oxytocin. These are each released by different glands for different causes, such as the cortisol. This is released by the adrenal glands above the kidney as a <sup>chemical</sup> response to stress. Oxytocin however, is arguably the most important hormone as it is closely tied to love, relationships, intimacy and connection.

Several studies have been conducted on the effects of oxytocin in creating ~~human~~ relationships and connections. A very prominent one is Ferguson et al (2001). In this study, the effect of oxytocin (within the genetic make up of rats) was investigated to see how it effected their recognition abilities of other rats. For a sample,

(male)  
forty-two <sup>as a control</sup> oxytocin secreting rats were selected <sup>along</sup> with forty-two <sup>(male)</sup> gene knockout rats. ~~The~~ Due to gene knock out, a process by which the transcription of DNA within the rats is altered, thus ~~they~~ <sup>the subject</sup> cannot <sup>experimentally group</sup> produce oxytocin, created a strong ~~control~~ <sup>control</sup> for the <sup>study</sup> ~~experiments~~. By implementing a repeated measures design, ~~and~~ researchers ~~was~~ investigated the interactions of these male rats with females. The procedure was simple, each male <sup>rat</sup> participant was placed in the same cage as a female rat for one minute of "interaction". This was repeated four times with the introduction of a new / different female rat on the fifth trial. All procedural aspects were maintained for the control and the experiment groups throughout the procedure. ~~formulated and investigated~~ after the experiment, results suggested that while the time of "interaction" for the oxytocin rats decreased with each trial (in the sense that the release of oxytocin evoked connection and familiarity between the male and female, thus they spent less time "reacquainting"), the "interaction" time for the gene knock out rats remained consistent even with the same female introduced 4 times. This suggests that oxytocin released in the rats is synchronous and ~~creates~~ builds familiarity and connection. Thus the lack of it leads to unfamiliarity and a disconnect in relationships. \* (evaluation next page!!)

From this experiment, it can be concluded that hormones are a key component of connection

and relationships. Even though the experiment participants (or subjects) are rats, this can still be applied to humans. With the results of this experiment, it has been suggested that oxytocin could play a prominent role in studies of autism. ~~and the~~ It may point to some of the effects of lacking oxytocin in the body (which may be the cause of autism, due to genetics) and why the behavior displayed by people with this illness struggle with making connections.

\* While the results of this study have conclusive, along with that of other studies such as Romero (2012), <sup>(w/ dogs)</sup> it cannot all be applied so readily to humans. Firstly, the subjects of this experiment are rats, which are mammals but relatively simple compared to humans. Further, the sample size is quite small and, the gene knockout rats were had had their DNA altered for the purpose of this experiment. Naturally this created a high internal validity but a low ecological validity as there are other external factors ~~was~~ that could affect this, and, altering the DNA of humans, for example, would be an enormous violation of ~~their~~ the ethical code in studies. Thus, these results may not be as applicable outside the grounds of this experiment.