Center for Investigating Healthy Minds

Rodrigues, S. M., Saslow, L. R., Garcia, N., John, O. P., & Keltner, D. (2009). Oxytocin receptor genetic variation relates to empathy and stress reactivity in humans. *Proceedings of the National Academy of Sciences* [Epub ahead of print].

Summary by Emma Seppala, Ph.D.; Postdoc Written December 2009

Oxytocin is a hormone and neuropeptide that has been linked to female reproductive activity, social and emotional behavior (affiliative behavior, generosity and trust), and the stress response (interactions with the hypothalamo-pituitary-adrenal axis). The authors hypothesized that genetic variations of the oxytocin receptor rs53576 would be associated with empathy and stress reactivity. 192 college students (59% female, average age 20) participated in the study.

Behavioral empathy was measured with the "Reading the Mind in the Eyes" test which assesses an individual's ability to correctly infer someone's emotional state based on viewing a picture of their eyes. Dispositional empathy was assessed with a self-report questionnaire (Davis' Interpersonal Reactivity Index). Individuals with one or two copies of the A allele (AG/AA) showed lower behavioral and dispositional empathy than individuals homozygous for the G allele (GG).

Behavioral stress reactivity was assessed by measuring individuals' average heart rate during the final anticipation period in a laboratory startle task that involved an upcoming burst of loud noise and controlled for average baseline heart rate during a paced breathing exercise. AG/AA individuals had greater heart rate reactivity than GG individuals, suggesting that their autonomic nervous system reacted with greater agitation to the anticipation of a stressful event. Dispositional stress reactivity was assessed by self-report for the personality trait "Neuroticism" which specifically assesses reactivity in stressful situations and crises. GG individuals scored lower on reported levels of dispositional stress.

No links were found between the oxytocin receptor gene rs53576 and variations in self-reported measures of attachment style and received parental care.

These findings suggest that genetic variation may impact both empathic responses as well as reactivity in the face of stress.