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More Than A Feeling

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Spring 2010 Searchlight on Gray Areas

More Than a Feeling

By Anne Pinckard

Berkeley researchers isolate the gene that enables us to feel for others.

How strongly we empathize and how stressed out we get are hereditary traits, according to new research from Berkeley. The study, conducted by a team of psychologists and neurobiologists, has pinpointed three genetic variations that affect how well our bodies use oxytocin, the hormone and neurotransmitter that controls how swept up we get in a novel and how jumpy we get after a loud sound.

"These are two kind of core parts of who people are," said Berkeley graduate student Laura Saslow, one of the lead authors. These hereditary variations represent a "lifetime of difference," and are "so chronic that they kind of changed who you are."

Often called the "cuddle" or "love" hormone, oxytocin also acts as a neurotransmitter and engenders many of our most tender emotions. It floods our bodies after orgasm, bringing about feelings of love and closeness, and perhaps cementing the bond between longtime lovers. When it's present in our bloodstream we tend to feel calmer. Its name stems from the Greek for "quick birth" because it triggers contractions. Stimulated by an infant's cry, it releases milk in breast-feeding women, and it is thought to nurture the bond between mother and child. Aberrations in the hormone's activity have been linked to autism, a condition marked by severe social isolation.

Oxytocin is produced in the brain and body and circulates in the bloodstream. Certain cells have a unique protein structure, called a receptor, which latches onto the chemical. Once attached, oxytocin triggers a series of changes—what we may experience as emotions and physical changes. Scientists speculate that the strength of the effect relies in part on how well oxytocin fits the receptor. The shape of the receptor is determined by its gene, which is known as OXTR.

Saslow and her colleagues identified three forms of the gene, denoted by their component DNA molecules as GG, AA, or GA. Saslow collected genetic samples from each of the study participants before testing their reactions to stress and their ability to empathize. The individuals with the GG form didn't get as jumpy when subjected to loud noises for the stress test. Similarly, the most empathetic people had the GG form, while those less able to distinguish others' feelings had either the GA or AA form.

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So just how much more empathetic were those with the good gene? The standard test to measure empathy is called "Reading the Mind in the Eyes": The participant studies images of people's eyes cropped from ads and other photos and is asked to choose which emotion is being portrayed. Those with the "good" gene correctly answered only 2 more out of 36 than the groups with the "A" form of the gene. Those with the GG form also got more caught up in a protagonist's plight in works of fiction and reported they weren't as bothered by stressful events.

The differences may be minor but they are measurable and distinct, and for Saslow, there's no question that they influence who we are. "This individual variation that's floating around in the background—that's what we call error a lot of times in social psychology. Well, it's not error, it's something that's inherited," she said. "It's really interesting to think, on a biological level, what does it mean to be more empathic and less stress reactive. How would that influence the rest of your life?"

Previous researchers have already found that women with the GG gene tended to be more sensitive and attentive mothers. Saslow will be incorporating genetic testing for the different variations into a long-term study about couples to determine how these small differences manifest in marriage and long-term relationships.

Saslow became curious about oxytocin when she encountered studies showing that people who snorted the substance became more generous, trusting, and empathetic. What struck Saslow was that though the participants' behaviors changed, their innate sense of empathy or generosity—as self-reported on a questionnaire—were not altered by the intranasal doses.

Which leaves at least one nagging question: If oxytocin works through the nose, can it be released into the air to manipulate people? "I had the idea that it might be a perfume and it might be scary," Saslow said. "But no, it's not like that. It's a big chunk of liquid that you have to inhale."

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