The kindness of strangers: Caring, trust linked to genetic variation

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Scientists have discovered that a gene that influences empathy, parental sensitivity and sociability is so powerful that even strangers observing 20 seconds of silent video identified people with a particular genetic variation to be more caring and trusting.

In the study, 23 romantic couples were videotaped while one of the partners described a time of suffering in their lives. The other half of the couple and their physical, non-verbal reactions were the focal point of the study. Groups of complete strangers viewed the videos. The observers were asked to rate the person on traits such as how kind, trustworthy, and caring they thought the person was, based on just 20 seconds of silent video.

"Our findings suggest even slight genetic variation may have tangible impact on people's behavior, and that these behavioral differences are quickly noticed by others," said Aleksandr Kogan, a postdoctoral fellow at the University of Toronto and the study's lead author.

The study builds on previous research conducted by Sarina Rodrigues Saturn, an assistant professor of psychology at Oregon State University. In that study, Saturn and her colleagues linked a genetic variation that affects hormone/neurotransmitter oxytocin's receptor to empathy and stress reactivity. Saturn is senior author on the new study, which is in the latest issue of Proceedings of the National Academy of Sciences (*PNAS*).

"It was amazing to see how the data aligned so strongly by genotype," Saturn said. "It makes sense that a gene crucial for social processing would yield these findings; other studies have shown that people are good at judging people at a distance and first impressions really make an impact."

Before the videos were recorded, the scientists tested the couples and identified their genotype as GG, AG, or AA. Individuals homozygous for the G allele (carrying two copies of the G version of the gene) of the oxytocin receptor tend to be more "prosocial," defined by researchers as the ability to behave in a way that benefits another person. In contrast, the carriers of the A version of the gene (AG or AA genotypes) tend to have a higher risk of autism, as well as self-reported lower levels of positive emotions, empathy and parental sensitivity.

Oxytocin has already been significantly linked with social affiliation and reduction in stress. It is a peptide made in the hypothalamus and has targets all over the body and the brain. It is best known for its role in female reproduction and is associated with social recognition, pair bonding, dampening negative emotional responses, trust and love.

Out of the 10 people who were marked by the neutral observer as "most prosocial, six carried the GG genotype associated with the oxytocin receptor; of the 10 people who were marked as "least trusted," nine were carriers of the A version of the gene. The people carrying an A version of the gene were viewed as less kind, trustworthy and caring toward their partners in the video.

"The oxytocin receptor gene in particular has become of great interest because a select number of studies suggest that it is related to how prosocial people view themselves," Kogan said. "Our study asked the question of whether these differences manifest themselves in behaviors that are quickly detectable by strangers, and it turns out they did."

What is not known, however, is what occurs from the genetic level to the behavior – that is, the exact way the gene affects the biology underlying behavior is still poorly understood and remains a major topic of inquiry. Saturn, for one, believes that people can and do overcome their genes all the time.

"These are people who just may need to be coaxed out of their shells a little," she said. "It may not be that we need to fix people who exhibit less social traits, but that we recognize they are overcoming a genetically influenced trait and that they may need more understanding and encouragement."

Kogan said that many factors ultimately influence kindness and cooperation.

"The oxytocin receptor gene is one of those factors – but there many other forces in play, both genetic and non-genetic," he said. "How all these pieces fit together to create the coherent whole of an individual who is or is not kind is a great mystery that we are only beginning to scratch."

Provided by Oregon State University