# Research finds gene that predicts happiness in women

August 28 2012

(Medical Xpress)—A new study has found a gene that appears to make women happy, but it doesn't work for men. The finding may help explain why women are often happier than men, the research team said.

Scientists at the University of South Florida (USF), the National Institutes of Health (NIH), Columbia University and the New York State Psychiatric Institute reported that the low activity form of the gene monoamine oxidase A (MAOA) is associated with higher self-reported happiness in women. No such association was found in men.

The findings appear online in the journal *Progress in Neuro-Psychopharmacology & Biological Psychiatry*.

"This is the first happiness gene for women," said lead author Henian Chen, MD, PhD, associate professor in the Department of Epidemiology and Biostatistics, USF College of Public Health.

"I was surprised by the result, because low expression of MAOA has been related to some negative outcomes like alcoholism, aggressiveness and antisocial behavior," said Chen, who directs the Biostatistics Core at the USF Health Morsani College of Medicine's Clinical and Translational Sciences Institute. "It's even called the warrior gene by some scientists, but, at least for women, our study points to a brighter side of this gene."

While they experience higher rates of mood and anxiety disorders,

women tend to report greater overall life happiness than do men. The reason for this remains unclear, Chen said. "This new finding may help us to explain the gender difference and provide more insight into the link between specific genes and human happiness."

The MAOA gene regulates the activity of an enzyme that breaks down serontin, dopamine and other neurotransmitters in the brain—the same "feel-good" chemicals targeted by many antidepressants. The low-expression version of the MAOA gene promotes higher levels of monoamine, which allows larger amounts of these neurotransmitters to stay in the brain and boost mood.

The researchers analyzed data from a population-based sample of 345 individuals – 193 women and 152 men – participating in Children in the Community, a longitudinal mental health study. The DNA of study subjects had been analyzed for MAOA gene variation and their self-reported happiness was scored by a widely used and validated scale.

After controlling for various factors, ranging from age and education to income, the researchers found that women with the low-expression type of MAOA were significantly happier than others. Compared to women with no copies of the low-expression version of the MAOA gene, women with one copy scored higher on the happiness scale and those with two copies increased their score even more.

While a substantial number of men carried a copy of the "happy" version of the MAOA gene, they reported no more happiness than those without it.

So, why the genetic gender gap in feeling good?

The researchers suspect the difference may be explained in part by the hormone testosterone, found in much smaller amounts in women than in

men. Chen and his co-authors suggest that testosterone may cancel out the positive effect of MAOA on happiness in men.

The potential benefit of MAOA in boys could wane as testosterone levels rise with puberty, Chen said. "Maybe men are happier before adolescence because their testosterone levels are lower."

Chen emphasizes that more research is needed to identify which specific genes influence resilience and subjective well-being, especially since studies of twins estimate genetic factors account for 35 to 50 percent of the variance in human happiness.

While happiness is not determined by a single gene, there is likely a set of genes that, along with life experiences, shape our individual happiness levels, Chen said. "I think the time is right for more genetic studies that focus on well-being and happiness."

"Certainly it could be argued that how well-being is enhanced deserves at least as much attention as how (mental) disorders arise; however, such knowledge remains limited."

**More information:** Henian Chen, Daniel S. Pine, Monique Ernst, Elena Gorodetsky, Stephanie Kasen, Kathy Gordon, David Goldman, Patricia Cohen; The MAOA gene predicts happiness in women; *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, online in advance of print Aug. 4, 2012; dx.doi.org/10.1016/j.pnpbp.2012.07.018

Provided by University of South Florida