

# Genes and stressed-out parents lead to shy kids

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New research from the Child Development Laboratory at the University of Maryland shows that shyness in kids could relate to the manner in which a stress-related gene in children interacts with being raised by stressed-out parents.

In a study published in the February issue of *Current Directions in Psychological Science*, Nathan Fox, professor and director of the Child Development Laboratory, and his team found that kids who are consistently shy while growing up are particularly likely to be raised by stressed-out parents, and to possess a genetic variant associated with stress sensitivity.

This suggests that shyness relates to interactions between genes and the environment, as opposed to either genes or the environment acting alone. "Moms who report being stressed are likely to act differently toward their child than moms who report little stress," said Fox. "A mom under stress transfers that stress to the child. However, each child reacts to that stress somewhat differently. Our study found that genes play a role in this variability, such that those children who have a stress-sensitive variant of a serotonin-related gene are particularly likely to appear shy while growing up when they also are raised by mothers with high levels of stress.

"We don't understand how the environment directly affects the gene, but we know that the gene shows particularly strong relationships to behavior in certain environments."

Like all genes, the particular serotonin-related gene examined in this study has 2 alleles, which can be long or short. The protein produced by the short form of the gene is known to predispose towards some forms of stress sensitivity.

Fox's research found that among children exposed to a mother's stress, it was only those who also inherited the short forms of the gene who showed consistently shy behavior.

"If you have two short alleles of this serotonin gene, but your mom is not stressed, you will be no more shy than your peers as a school age child," says Fox. "But we found that when stress enters the picture, the gene starts to show a strong relationship to the child's behavior," says Fox. "If you are raised in a stressful environment, and you inherit the short form of the gene, there is a higher likelihood that you will be fearful, anxious or depressed."

Fox's group studies how genes and the family environment work together to shape the development of social competence in infants and young children. "We are particularly interested in very shy children. What keeps them shy and what may change them from being shy to not being shy anymore?"

"We identify these children early in the first years of life, but it's not enough to identify a child with a certain disposition or gene. We want to understand how the environment works together with genes, what are the mechanisms that shape behavior."

Source: Association for Psychological Science

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