

SURPRISING FINDINGS SHOW COMPLEX GENE EFFECTS ON ADHD

Data from a new study reveal how genes can affect thinking and behavior, sometimes in unexpected ways.

Tanya Froehlich and colleagues measured the lead levels and ADHD symptoms of 172 boys and girls. Eight percent of the children were diagnosed with ADHD, but one-quarter exhibited some ADHD symptoms.

The researchers discovered that children with one variant of DRD4, a gene involved in regulating brain levels of dopamine, had greater difficulty performing tasks involving executive function-planning, organization, and the ability to revise strategies in response to new information.

However, there was a twist: While children with this high-risk gene variant were more likely to exhibit ADHD symptoms, lead exposure did not increase their risk. In contrast, children with the low-risk variant were less likely to have ADHD symptoms-but for these children, lead exposure significantly increased the risk of having ADHD. Says Froehlich, "In an environment contaminated with lead, a genetic variation that was protective becomes disadvantageous."

The researchers also found that elevated lead exposure impaired performance in planning and attentional flexibility in boys more than in girls. "This suggests," says Dr. Froehlich, "that, for these executive functions, boys are more vulnerable to the adverse effects of lead exposure. This is also consistent with the established fact that boys have higher rates of ADHD than girls."

"Study links ADHD cognitive and behavioral problems to genetic and environmental interactions," news release, Cincinnati Children's Hospital Medical Center, May 1, 2006; and "Lead exposure tied to ADHD symptoms," Serena Gordon, *HealthDay*, May 1, 2006.