

Hyperactivity, Opposition, Aggression and Intelligence: A new publication in Archives of General Psychiatry

-Abstract-

Background

Dopaminergic neurotransmission is implicated in externalizing behavior problems, such as aggression and hyperactivity. Externalizing behavior is known to be negatively associated with cognitive ability. Activation of dopamine D4 receptors appears to inhibit the functioning of the prefrontal cortex, a brain region implicated in cognitive ability. The 7-repeat allele of the dopamine D4 receptor gene produces less efficient receptors, relative to other alleles, and this may alter the effects of dopamine on cognitive function.

Objective

To examine the influence of a polymorphism in the third exon of the dopamine D4 receptor gene on the association between externalizing behavior and IQ. **Design** In 1 community sample and 2 clinical samples, the presence or absence of the 7-repeat allele was examined as a moderator of the association between externalizing behavior and IQ; the strength of this effect across samples was estimated meta-analytically.

Patients

Eighty-seven boys from a longitudinal community study, 48 boys referred clinically for aggression, and 42 adult males diagnosed with attention-deficit/hyperactivity disorder.

Main Outcome Measures

IQ scores and observer ratings of externalizing behavior were taken from existing data sets. Results Among individuals lacking the 7-repeat allele, externalizing behavior was negatively correlated with IQ (mean $r = -0.43$; $P < .001$). Among individuals having at least 1 copy of the 7-repeat allele, externalizing behavior and IQ were uncorrelated (mean $r = 0.02$; $P = .45$). The difference between these correlations was significant ($z = -2.99$; $P < .01$).

Conclusions

Allelic variation of the dopamine D4 receptor gene appears to be a genetic factor moderating the association between externalizing behavior and cognitive ability. This finding may help to elucidate the adaptive value of the 7-repeat allele.

Reference: DeYoung, C. G., Peterson, J. B., Séguin, J. R., Mejia, J. M., Pihl, R. O., Beitchman, J. H., Jain, U., Tremblay, R. E., Kennedy, J. L., & Palmour, R. M. (2006). The Dopamine D4 Receptor Gene and Moderation of the Association Between Externalizing Behavior and IQ. *Archives of General Psychiatry*, 63, 1410-1416.

See also : www.gripinfo.ca/medias