

---

# ADHD, autism spectrum disorder, temperament, and character: Phenotypical associations and etiology in a Swedish childhood twin study

Nóra Kerekes, Sven Brändström, Sebastian Lundström, Maria Råstam, Thomas Nilsson, Henrik Anckarsäter

Comprehensive Psychiatry, Available online 20 June 2013, ISSN 0010-440X

## Objective

To explore the links between neurodevelopmental disorders – attention deficit hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) – and personality in a population-based, genetically sensitive study of children.

## Method

A population-based sample of 1886 twins aged 9 and 12, enriched for childhood mental health problems, was recruited from the Child and Adolescent Twin Study in Sweden (CATSS). Parents were interviewed over the telephone using the Autism-Tics, AD/HD and other Comorbidities (A-TAC) inventory, and in a second step they rated their children according to the Junior Temperament and Character Inventory (JTCI).

## Results

ADHD was strongly correlated with novelty seeking, while ASD was correlated positively with harm avoidance and negatively with reward dependence. The strongest associations between personality traits and neurodevelopmental disorders were negative correlations between the character dimensions of self-directedness and cooperativeness and ADHD and ASD alike. Cross-twin cross-trait correlations between ADHD, ASD, and personality dimensions in monozygotic twins were more than double those in dizygotic twins, indicating a strong genetic effect behind the phenotypic covariation between neurodevelopmental disorders and personality.

## Conclusions

Neurodevelopmental disorders are linked specifically to particular temperament profiles and generally to hampered development of the self-governing strategies referred to as “character.” Poor self-agency and cooperation may be core functional outcomes in the separation of children with

handicapping conditions from those with traits only reminiscent of neurodevelopmental disorders. The associations between neurodevelopmental disorders and personality are at least partly due to genetic effects influencing both conditions. As a consequence, personality must be broadly considered in neuropsychiatry, just as neuropsychiatric disorders and their genetic, neurodevelopmental, and cognitive susceptibilities have to be in personality research and clinical treatment.