

NAME OF PRESENTING AUTHOR: Daniel L. Wechsler

EMAIL ADDRESS OF PRESENTING AUTHOR: daniel.wechsler@kcl.ac.uk

Do adult ADHD symptoms share genetic underpinnings with child ADHD symptoms and those of related comorbid childhood disorders? Comparing within-child and mother-child genetic correlations in a large Norwegian Children-of-Twins-and-Siblings cohort.

Daniel L Wechsler<sup>1</sup>, Fruhling V Rijdsdijk<sup>1</sup>, Espen M Eilertsen<sup>2,3</sup>, Eivind Ystrom<sup>2,3,4</sup>, Yasmin I Ahmadzadeh<sup>1</sup>, Isabella Badini<sup>1</sup>, Laurie J Hannigan<sup>5,6</sup>, Tom A McAdams<sup>1,2</sup>

<sup>1</sup> Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, United Kingdom

<sup>2</sup> PROMENTA Research Centre, University of Oslo, Oslo, Norway

<sup>3</sup> Department of Mental Disorders, Norwegian Institute of Public Health, Oslo, Norway

<sup>4</sup> School of Pharmacy, University of Oslo, Oslo, Norway

<sup>5</sup> Nic Waals Institute, Lovisenberg Diaconal Hospital, Oslo, Norway

<sup>6</sup> Medical Research Council Integrative Epidemiology Unit, University of Bristol, Bristol, UK

KEYWORDS: ADHD, Comorbidity, Genetics, Mother, Child

ABSTRACT:

Addressing the debate about whether ADHD symptomatology in childhood and adulthood could be etiologically distinct, we used a novel quantitative genetic approach in a large family dataset to assess whether ADHD symptoms in mothers and children shared similar genetic correlations with symptoms of ADHD-related comorbid disorders in children. Genetic correlations were derived from two methodologies: 1) Extended bivariate twin analyses (including siblings and cousins) assessing within-child genetic overlap; 2) Multiple-Children-of-Twins-and-Siblings analyses assessing between-mother-and-child genetic overlap. Both sets of analyses used a common sample taken from the Mother and Child Cohort Study (MoBa), a large Norwegian birth registry cohort of ~115,000 pregnancies. Maternal ADHD symptoms were assessed at child age 3 years, and child ADHD symptoms were assessed at age 5 years. Comorbid symptom measures were child ODD, conduct disorder, anxiety and depression symptoms, all at age 8 years. High genetic correlations were found between maternal ADHD symptoms and child ADHD and comorbid symptoms. Shared genetic influences accounted for the majority of all mother-child phenotypic associations, closely reflecting the high proportions of within-child phenotypic associations explained by genetic overlap. Using a novel family-based approach, our results provide evidence that ADHD symptoms in children, and in their adult parents, share comparable genetic overlap with children's later symptoms of several common ADHD-related disorders. This suggests that symptoms of ADHD as measured in the adult mothers in our sample are not etiologically distinct to those measured in children, as they are related to a wider array of ADHD-related comorbid symptomatology in their children.

GRANT SUPPORT: DLW is supported by the UK Medical Research Council (MR/N013700/1) and King's College London member of the MRC Doctoral Training Partnership in Biomedical Sciences. TAM and YIA are supported by a Wellcome Trust Senior Research Fellowship awarded to TAM (220382/Z/20/Z). EY (288083; 262177) and TAM (288083) are supported by the Research Council of Norway. EME is supported by the Norwegian Research Council (262177 and 288083). IB is supported by the UK Economic and Social Research Council (ESRC) and King's College London member of the ESRC Doctoral Training Partnership in Interdisciplinary Social Science (ST11872).