Adolescent Psychopathology and Cognitive/Academic Functioning: Impact of Comorbidity Using a Genetically Sensitive Design

Dr Olakunle Oginni[1]*, Prof Fruhling Rijsdijk[2,3], Dr Adam Tarnoki[4], Dr David Tarnoki[4] and Dr Kaili Rimfeld[5]

[1]Cardiff University, Cardiff, United Kingdom; [2]Anton de Kom University of Suriname, Paramaribo, Suriname; [3]King's College London, London, United Kingdom; [4]Semmelweis University, Budapest, Hungary and [5]Royal Holloway University of London, London, United Kingdom
*Presenting author.

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Aims. To determine: i. the nature of the associations between three domains of psychopathology (depressive, hyperactivity and conduct symptoms) and cognitive/academic performance among adolescents i.e., whether these reflect causal processes and/or common genetic effects; ii. The extent to which these associations vary by comorbidity.
Methods. The sample comprised participants in the UK Twins Early Development Study (TEDS; n≈12,000 individuals) assessed for depressive, hyperactivity and conduct symptoms using standardised questionnaires. Cognitive and academic performance were assessed using Standard Progressive Matrices and GCSE scores respectively. Comorbidity was derived as a count of borderline/high psychopathology scores present per individual. Twin modelling was used to investigate preliminary correlations and moderation effects. Genetic models were further used to determine the most likely direction of causal effects with/without genetic correlations.
Results. There were small to moderate negative correlations between adolescent psychopathology domains and cognitive performance ($-0.01 \leq r \leq -0.15$) and academic performance ($-0.06 \leq r \leq -0.23$). Correlations were smallest for depressive symptoms and larger for hyperactivity/conduct symptoms. The correlation between hyperactivity symptoms and cognitive performance was significantly more negative as comorbidities increased (moderation coefficient – $\beta_{mod} = 0.07$, 95% CI: 0.02, 0.12). Similarly, the association between depressive symptoms and academic performance also became more negative as comorbidities increased ($\beta_{mod} = -0.08$, 95% CI: −0.11, −0.05). Twin modelling indicated that hyperactivity symptoms were causally associated with poorer cognitive and academic performance. In contrast, poorer cognitive performance was causally associated with conduct symptoms.
Conclusion. These preliminary findings indicate the impact of comorbidity on the functioning of adolescents with hyperactivity and depressive symptoms. They further suggest the need to specifically recognise these comorbidities during assessment and treatment planning to promote optimal functioning. Our findings also suggest differential mechanisms for the links between different psychopathology domains and impaired functioning. Further analyses will investigate moderation of the causal links and/or genetic correlations and whether these associations vary by indicators of marginalisation (sex and ethnicity).

Modelling Co-Occurring Mental Health Conditions Among Autistic Individuals Using Polygenic Scores

Dr Adeniran Okewole[1]*, Dr Vincent-Raphael Bourque[2], Dr Sebastien Jacquemont[2], Dr Varun Warrier[3] and Professor Simon Baron-Cohen[4]

[1]Department of Psychiatry, Cambridge University, Cambridge, United Kingdom; [2]Centre Hospitalier Universitaire Sainte-Justine Centre de Recherche, Montreal, Canada; [3]Department of Psychology, Cambridge University, Cambridge, United Kingdom and [4]Autism Research Centre, Cambridge, United Kingdom
*Presenting author.

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Aims. This study investigated the relationship between common genetic variation and co-occurring mental health conditions among autistic individuals.
Methods. The study was conducted with the Simons Foundation Powering Autism Research (SPARK) dataset, V9 release, and included probands [n = 17,582] with confirmed diagnosis of autism, who were also in the SPARK iWES1 array genotyping dataset. Six co-occurring mental health conditions (attention deficit hyperactivity disorder or ADHD, bipolar disorder, depression, schizophrenia, anxiety disorder and disruptive behaviour disorders) were analysed. Polygenic scores (PRS) were generated with PRScs software, using summary statistics from the most recent genome wide association studies (GWAS) for autism, ADHD, schizophrenia, bipolar disorder, depression, anxiety, neuroticism, p-factor, intelligence, educational attainment and hair colour (negative control). General linear models (GLM) and Cox proportional hazards models were computed, with age at registration, sex, cognitive impairment and genetic principal components included in both sets of models. Multiple testing correction was done using the Benjamini-Yekutieli method. Results were calculated using odds ratios (OR), 95% Confidence Intervals (CI) and corrected p values (p).
Results. There were similar patterns of association and interaction for both GLMs and Cox models. Polygenic scores for educational attainment were significantly lower for those with co-occurring ADHD (GLM: OR=8.85E-01, 95% CI=8.48e-01–9.23e-01, p = 2.91E-07; Cox: OR=8.94E-01, 95% CI=8.66e-01–9.22e-01, p = 4.76E-11), bipolar disorder (GLM: OR=7.45E-01, 95% CI=6.54e-01–8.49e-01, p = 2.40E-04; Cox: OR=7.25E-01, 95% CI=6.39e-01–8.23e-01, p = 3.96E-05), depression (GLM: OR=8.63E-01, 95% CI=8.04e-01–9.26e-01, p = 5.13E-04; Cox: OR=8.56E-01, 95% CI=8.03e-01–9.12e-01, p = 2.80E-05), schizophrenia (GLM: OR=6.94E-01, 95% CI=5.71e-01–8.42e-01, p = 3.99E-03; Cox: OR=6.67E-01, 95% CI=5.52e-01–8.05e-01, p = 1.41E-03), anxiety disorder (GLM: OR=8.77E-01, 95% CI=8.37e-01–9.20e-01, p = 9.88E-07; Cox: OR=8.81E-01, 95% CI=8.49e-01–9.15e-01, p = 1.46E-09) and disruptive behaviour disorders (GLM: OR=7.10E-01, 95% CI=6.63e-01–7.60e-01, p = 3.22E-21; Cox: OR=7.10E-01, 95% CI=6.67e-01–7.57e-01, p = 1.35E-24).
Conclusion. Polygenic scores for educational attainment were associated with the co-occurrence of several mental health conditions among autistic individuals.

How Are Inpatient Psychiatric Ward Rounds Understood in Research Literature? A Scoping Review

Dr Benjamin Williams[1], Dr Oluwatomilola Olagunju[1]*, Ms Siobhan Richardson[1] and Ms Georgia Jameson[2]

[1]Park House, Greater Manchester Mental Health NHS Foundation Trust, Manchester, United Kingdom and [2]Equality Diversity and Inclusion Team, Greater Manchester Mental Health, Manchester,