Keywords: Psychopathy, Antisocial Behavior, Resting State Networks, fMRI Resting State, Independent Component Analysis

S182. Evidence That the Polygenic Risk Score for Neuroticism Does Not Moderate the Impact of Childhood Trauma on Neuroticism: A GxE Model

Boris Klingenberg¹, Sinan Guloksuz², Claudia Menne-Lothmann¹, Jeroen Decoster³, Ruud van Winkel³, Dina Collip¹, Philippe Delespaul¹, Marc De Hert⁴, Catherine Derom⁵, Evert Thiery⁶, Nele Jacobs⁷, Marieke Wichers⁸, Lotta-Katrin Pries¹, Ozan Cinar¹, Lin Bochao⁹, Jurjen Luykx⁹, Jim van Os¹⁰, and Bart Rutten¹

¹Maastricht University Medical Centre, ²Maastricht University Medical Centre, Yale School of Medicine, ³Maastricht University Medical Centre, KU Leuven, ⁴University Psychiatric Centre, KU Leuven, ⁵University Hospitals Leuven, Ghent University Hospitals, ⁶Ghent University Hospitals, ⁷Maastricht University Medical Centre, Open University of the Netherlands, ⁸Maastricht University Medical Centre, University Medical Center Groningen, The Interdisciplinary Center Psychopathology and Emotion Regulation (ICPE), ⁹Brain Centre Rudolf Magnus, University Medical Center Utrecht, ¹⁰Maastricht University Medical Centre, Brain Centre Rudolf Magnus, University Medical Center Utrecht, King's College London

Background: Neuroticism is thought to result from both environmental factors, such as childhood adversities, and individual genetic architecture which consists of many genetic variants of small effect (single nucleotide polymorphisms [SNPs]). We, therefore, aimed to investigate—for the first time—whether the genetic vulnerability (polygenic risk score [PRS] for neuroticism) moderates the impact of childhood adversities (CA) on neuroticism.

Methods: Data were derived from a general population adolescent and young adult twin sample. The total sample included 617 (Monozygotic=190, Dizygotic=427). The Short Eysenck Personality questionnaire (EPQ: 12 items), was used to measure neuroticism. PRS were trained on the results from the Genetics of Personality Consortium. Multilevel regression analyses, taking into account observations nested within twin pairs, were used to analyze the moderating effect of PRS (p -value<0.05) on the association between CA (Childhood Trauma Questionnaire sum-score) and neuroticism (EPQ sum-score). All analyses were adjusted for age, gender and 2 principle components (covariate, covariate X environment and covariate X PRS).

Results: There was no G-E correlation. Both PRS ($b=5976.81$, $p=0.025$, 95% CI=735.77-11217.85) and CA ($b=0.08$, $p<0.001$, 95% CI=0.051-0.11) predicted neuroticism in separate models. However, in the interaction model, neither the main effect of PRS on neuroticism nor the multiplicative interaction between PRS and CA was significant; while CA remained associated with neuroticism ($b=0.07$, $p=0.005$, 95% CI=0.02-0.12).

Conclusions: These results suggest that in the presence of childhood adversity the current cumulative genetic risk score for neuroticism has a negligible impact on the explained variance of the phenotypical expression of neuroticism.

Supported By: The authors would like to acknowledge that the East Flanders Prospective Twin Survey (EFPTS) is partly supported by the Association for Scientific Research in Multiple Births and that the TwinssCan project is part of the European Community's Seventh Framework Program under grant agreement No. HEALTH-F2-2009-241909 (Project EU-GEI).

Keywords: Gene x Environment, Neuroticism, Polygenic Risk Score, Childhood Adversity, Twins

S183. Cardiac Afferent Signals Augment Fear in Anxiety Inhibit Fear in Schizophrenia

Sarah Garfinkel¹, Cassandra Gould van Praag¹, Donna Ewing², Frances Meeten¹, and Hugo Critchley¹

¹University of Sussex, ²University of Brighton

Background: Heart and brain are dynamically coupled, particularly in the context of emotional arousal. Arterial baroreceptor afferents signal physiological arousal from the strength and timing of heartbeats. We tested for aberrant coupling of emotions to afferent cardiac signals in specific clinical psychiatric disorders characterised by affective disturbance.

Methods: We tested 296 patients with diagnoses encompassing Anxiety (N=28), Depression (N=58), Depression and Anxiety (N=42), Borderline Personality Disorder (N=22), Bipolar Disorder (N=50), Schizophrenia (N=18), Affective Psychosis (N=23, matching the Schizophrenia group for medication), and N=55 Healthy Control Participants. Individual participants were randomly presented emotional and neutral faces (100ms), either at cardiac systole, during arterial baroreceptors firing to brain, or at diastole, between heartbeats when baroreceptors are quiescent. Participants rated the emotional intensity of the faces.

Results: There was a significant differentiating effect of cardiac cycle on fear processing as a function of diagnosis [$F(7, 287)=2.47$, $p=0.018$]. As previously noted, sensitivity to fear expressions was greater at cardiac systole (relative to diastole) in control participants [$t(54)=-2.28$, $p=0.027$]. Importantly, this cardiac facilitation of fear was amplified in Anxiety patients [$t(26)=-3.51$, $p=0.002$] and, strikingly, the reverse effect was observed in patients with Schizophrenia, where cardiac afferent signals reduced fear intensity relative to faces processed at diastole [$t(17)=3.81$, $p=0.001$].

Conclusions: Our findings show that cardiac afferent signals can shape emotion processing, with differentiating impact in Anxiety and Schizophrenia. These embodied mechanisms will inform novel treatment targets for major psychiatric disorders.

Supported By: This work was conducted with support from the European Research Council (Advanced Grant Adg 324150 CCFIB to HDC) and by a philanthropic donation from the Dr. Mortimer and Theresa Sackler Foundation

Keywords: Schizophrenia, Anxiety, Interoception, Baroreceptor