

## **P-1213 - THE CONTINUUM HYPOTHESIS: MULTIDIMENSIONAL EYE MOVEMENT PHENOTYPES IN NOSOLOGY AND TAXONOMY**

P.J.Benson<sup>1</sup>, S.A.Beedie<sup>1, D.M. St.Clair<sup>2</sup></sup>

<sup>1</sup>School of Psychology, King's College, University of Aberdeen, <sup>2</sup>Division of Mental Health, Royal Cornhill Hospital, University of Aberdeen, Aberdeen, UK, <sup>3</sup>Genes, Cognition and Psychosis Program, NIMH, Bethesda, MD, USA

Clinical diagnosis currently requires fitting symptoms to DSM, ICD or RDC criteria and assumes face validity of the presentation and medical history. Clinical signs and symptoms can overlap illness categories, and the recent genetic evidence of biological overlap between major illnesses such as schizophrenia and bipolar disorder lends significant support to the case for refinement of classification systems. We recruited 222 individuals who had DSM-IV schizophrenia or mood disorders (bipolar, unipolar/MDD, schizo-affective) confirmed with OpCrit, and 208 diagnosis-free volunteers as controls. Eye movement function was assessed using pursuit, fixation and static picture viewing tests; extensive demographic, neuropsychological and state measures were also obtained for each person. The natural boundaries between illness types were probed using supervised and unsupervised machine learning using eye movement information alone. Respectively, a probabilistic network delineated case groups and controls according to current nosological practice with exceptional accuracy while a Bayesian approach described a taxonomic geometry consistent with a trait continuum. Taxonomies derived from eye movement measures reveal a multidimensional space spanning naturally occurring clusters of 'normal', subclinical and abnormal clinical traits. Dimensionality reduction to simplify interpretation of cluster shape, orientation and fuzziness provides an index of phenotype heterogeneity. These results let us understand various psychiatric eye movement phenotypes hierarchically and at multiple scales and support the idea of a psychometric continuum along non-linear dimensions populated by many subtypes of people. We now need to study how clinical symptoms map onto this space.