learning and memory. We sought to test whether training early visual processing would improve visual memory and facial affect recognition by targeting a well-characterized visual deficit in schizophrenia: visual backward masking (VBM). The deficit is so common in schizophrenia, and in non-affected family members to a lesser degree, that it is viewed as an endophenotype. The VBM deficit, however, can normalize as we have previously shown. In our prior open-label pilot study, individuals with schizophrenia (Surti and Wexler, 2012) made substantial gains in VBM performance with rudimentary computerized VBM training. The VBM improvements were also accompanied by improvements in visual memory.
To test the hypothesis that improved early sensory training could lead to other cognitive gains in the same domain, we conducted a randomized control study with a new, more sophisticated computerized VBM training program, and compared it to an active control condition. We expected that visual memory and facial affect recognition would improve with the novel visual training (VT), and that VBM would improve with the VT as well.
Methods: 23 individuals with stable schizophrenia or schizoaffective disorder were randomized to receive 20 sessions of VT or an active control. The VT consisted of VBM training with multiple levels of difficulty, adaptive tracking, virtual rewards, and a variety of letters, numbers, and shapes to train different areas of the visual field. The active control condition was a commercially available computerized typing tutorial (TT) with animation, game narrative, and multiple typing activities. Participants were tested before and after training with: the Matrics Cognitive Consensus Battery (MCCB), including the Brief Visuospatial Memory Test-Revised (BVMT) as the study's primary outcome; the Profile of Nonverbal Sensitivity (mini-PONS) to assess non-verbal social cues; standardized VBM tests; and typing assessments. Repeated measure ANOVAs were conducted in SPSS24 after checking for normality.
Results: 22 of 23 individuals completed the study, and by participants' reports, both interventions were well tolerated, equally enjoyable and equally motivating, though the VT was slightly more frustrating for participants. Even when co-varying for education, which was higher in the VT group, there were no condition by time interactions for the BVMT, the mini-PONS, overall MCCB, or typing ability. There was a significant condition by time interactions for VBM performance ($F = 5.8$, $p = 0.028$), with a substantial improvement in the VT group (Cohen's $d = 0.54$; $p = 0.004$).
Discussion: Patients with schizophrenia equally tolerated a computerized visual training designed in-house and an off-the shelf highly gamified control training, but only the visual training, specifically designed for individuals with schizophrenia, had effects on the trained task. The effects of the visual training did not generalize to visual memory, facial affect recognition, or global cognition, so further work is needed to facilitate generalization.

T74. ACADEMIC ACHIEVEMENT AND SCHIZOPHRENIA: A META-ANALYSIS

Hannah Dickson*[,1], Alexis Cullen[1], Sheilagh Hodgins[2], James MacCabe[1], Kristin Laurens[3]
[1]Institute of Psychiatry, Psychology & Neuroscience, King's College London; [2]University of Montreal; [3]Australian Catholic University

Background: The extent to which poor academic achievement is associated with later schizophrenia is unclear. The aim of the present study was to update our prior meta-analyses which examined academic achievement in youth aged 16 years or younger who later developed schizophrenia or schizophrenia spectrum disorders (SSD) and those who did not (Dickson et al, 2012, Psychological Medicine, 42, 743–755). We also conducted a new meta-analysis on published studies that reported on general academic achievement in youth at-risk for schizophrenia/SSD aged 16 years or younger compared to typically developing youth
Methods: In addition to the five studies included in our earlier meta-analyses, a further three prospective investigations of birth or genetic high-risk cohorts were identified that reported results using objective measures of general academic achievement and of mathematics achievement for individuals who did and did not develop schizophrenia/SSD in adulthood. For our new meta-analysis we identified a total of seven studies that met the following inclusion criteria: (1) written in English; (2) objective measure of general academic achievement consisting of scores on least two core academic subjects (i.e., literacy and mathematics) at age 16 years or younger; (3) results provided for youth at high risk for developing schizophrenia/SSD in adulthood by virtue of having at least one first-degree relative with the disorder or reporting psychotic like-experiences (PLEs); and (4) sufficient data to calculate effect sizes.
Results: Meta-analyses showed that by age 16 years, individuals who later developed schizophrenia/SSD presented with significantly poorer general academic achievement ($d = -0.26$) and mathematics achievement ($d = -0.21$). Findings also indicated that during adolescence, youth with a family history of schizophrenia/SSD and youth reporting PLES were characterised by significantly lower general academic achievement than healthy peers ($d = -0.39$; $d = -0.53$, respectively).
Discussion: These results show that poor academic achievement precedes illness onset, and may represent an easily identifiable non-specific marker of biological, psychological and social risk processes underpinning the development of schizophrenia/SSD.

T75. GENERAL AND EXECUTIVE COGNITIVE PROFILES: GENERAL COGNITIONS INFLUENCE ON WCST PERFORMANCE

Sean Carruthers*[,1], Caroline Gurvich[2], Philip Sumner[3], Eric Tan[4], Elizabeth Thomas[2], Susan Rossell[1]
[1]Swinburne University; [2]The Alfred Hospital, Monash University; [3]Swinburne University, The Alfred Hospital; [4]The Alfred Hospital, Monash University, Swinburne University

Background: Executive functions (EF) have been conceptualized as a set of higher-level control processes that enable an individual to adapt to diverse situations, inhibit inappropriate responses, formulate, initiate and persevere plans and mediate the organisation of goal-directed thoughts and actions and are commonly reported as being compromised in schizophrenia. Complex measures designed to assess EF suffer from task impurity, activating and reporting on the performance of non-EF processes. The present study examined the potential contribution discrete cognitive subtypes might have on performance on the Wisconsin Card Sorting Test
Methods: Ward's method hierarchical cluster analysis was performed on the MATRICS Consensus Cognitive Battery (MCCB) and the Wisconsin Card Sorting Test (WCST) collected from 105 healthy controls and 100 patients with schizophrenia/schizoaffective disorder.
Results: Two cognitive profiles were identified for general cognition (High/Low) and the WCST (High/Low). For controls, only 53% of low performing participants performed low on the WCST. For patients, 73.5% of patients who performed poorly on the MCCB were found to perform poorly on the WCST.
Discussion: Results indicate that the contribution of general cognitive domains on poor WCST performance differs between patients and control participants. For patients, there appears to be a substantial contribution of impaired general cognition to performance the WCST.

T76. INVESTIGATION OF NAV1.1 POSITIVE MODULATOR EFFECTS ON FAST SPIKING INTERNEURONS IN SOMATOSENSORY CORTEX SLICES

Piszar Ildiko[1], Just Stefan[1], Draheim Henning*[,1]
[1]Boehringer Ingelheim

Background: GABAergic inhibition is essential for normal cortical function as it serves the purpose of proper excitation/inhibition (E/I) balance in many circuits. In contrast, inappropriate interneuron signaling leads to E/I imbalance, reduced gamma oscillations in EEG measurements and has serious behavioural consequences. Among the heterogeneous group of GABAergic cells, fast-spiking, parvalbumin positive interneurons (FS-PV+) play a key role in the generation and maintenance of gamma oscillations. E/I imbalance due to interneuron dysfunction has been implicated in the pathophysiology of various psychiatric disorders.
Cognitive impairment has been associated with altered gamma oscillation in schizophrenia and there is accumulating evidence for involvement of FS-PV+ interneuron deficit in the disease. Hypofunction of FS-PV+ neurons leads to disinhibition of pyramidal cells which cause network desynchronization. Therefore, it is hypothesized that activation of these neurons could restore high-frequency oscillations and consequently improve cognitive functions. However selective modulation of different interneuron types is still challenging due to limited number of known cell type specific targets.
Methods: A possible starting point for the treatment could be pharmacological activation of voltage gated sodium channels (Nav) which have a pivotal role in action potential initiation. Of the four subtypes of Nav channels expressed in the CNS Nav 1.1 comprises the majority of the sodium current in FS-PV+ but not in pyramidal neurons. Based on this we looked for selective Nav 1.1 activators and found a recently published promising compound (Compound 3a, see Crestey et al, 2015) which has been shown to increase the electrical activity of FS-PV+ interneurons in the CA1 area of the hippocampus. However, the dysfunction in information processing found in schizophrenic patients is not only restricted to the hippocampus and high-order association cortices but also influences the sensory cortex. Thus, our aim was to explore the effect of the selective Nav 1.1 positive modulator Compound 3a on FS interneurons in the mouse somatosensory cortex. We performed whole-cell patch clamp recordings from mouse cortical brain slices and recorded the electrical activity of single FS cells before and after the drug application.
Results: Surprisingly the excitatory effect of the compound 3a could only partly be confirmed in the way that positive modulation of Nav1.1 in terms of action potential number and threshold only takes place under particular conditions, i.e. at physiological temperature and under specific ion compositions of the recording solutions
Discussion: The discrepancy of our results from published data might be attributed to the different experimental conditions such as recording temperature and ionic composition of solutions and highlight the importance of selecting near physiological conditions during brain slice patch clamp experiments.

T77. DIAGNOSTIC AND NEUROCOGNITIVE CORRELATES OF SCHIZOTYPY WITHIN AND ACROSS THE PRONIA STUDY GROUPS

Carolina Bonivento*[,1], Maria Fernanda Urquijo[2], Stefan Borgwardt[3], Eva Meisenzahl[4], Marlene Rosen[5], Raimo Salokangas[6], Rachel Upthegrove[7], Stephen Wood[8], Nikolaos Koutsouleris[2], Paolo Brambilla[9]
[1] University of Udine; [2]Ludwig-Maximilian-University; [3]University of Basel; [4]Heinrich-Heine University Düsseldorf; [5]University of Cologne; [6]University of Turku; [7]University of Birmingham; [8]The University of Melbourne; [9]University of Milan,

Background: Schizotypy traits range from odd behaviors to symptoms that resemble full schizophrenia, although less severe. Previous studies associated different degrees of positive and negative schizotypal traits to variations in the persons' cognitive profiles while others related them to the risk to develop psychosis.
We hypothesize that similar pattern of positive and negative schyzoypy traits characterize individuals at risk of psychosis and patients meeting the criteria for recent onset psychosis, although with different degrees of severity. Also, both should differ from depressed patients. Moreover, specific combinations of schizotypy traits and neurocognitive alterations should be associated to the different psychopathological profiles. The final goal of the study is to identify candidate predictors of risk of psychosis that will be used as features in next machine learning analyses.
Methods: The present is a multi-centric study that was conducted as part of the project titled 'Personalised Prognostic Tools for Early Psychosis Management' (PRONIA).
115 participants at high-risk for psychosis (CHR), 114 recent onset psychosis (ROP), 123 recent onset depression (ROD) and 252 healthy controls (HC) took part in the study.
All were aged between 15 and 40 years.
The participants filled the Wisconsin Schizotypy questionnaire, measuring positive (Magical Ideation Scale - MIS; Perceptual Aberration Scale - PAS) and negative schizotypy traits (Social Anhedonia Scale - SAnS; Physical Anhedonia Scale - PAnS).
Moreover, they were administered the PRONIA Cognitive Battery (PCB), comprising measures of visuo-spatial dexterity and memory (Rey Figure, copy and delayed drawing), short-term memory (Digit Span - DS), Verbal Learning, Verbal Fluency, Attention (Continuous Performance Test - CPT, Digit Symbol Substitution Test - DSST), Emotions' Recognition, General Intelligence (WAIS Vocabulary, Matrix Reasoning).
Results: We run i) a Multivariate Analysis of Covariance with 'WSS subscales' as dependent variable; 'Group' as between subject factor; 'Age' and 'Gender' as covariates; ii) a Multinomial logistic regression with 'Group' as dependent variable; HC 'Group' as reference parameter; 'WSS subscales' and scores at the PCB's tests as predictors; 'Age' and 'Gender' as covariates. ROP and CHR reported both positive and negative schizotypy traits, although only the negative symptoms involving social aspects were clearly evident in CHR. Also, ROP and CHR differed for the positive symptoms, as they were present but at a lower level in CHR than in ROP. ROD instead scored high at the negative symptoms. Interestingly, ROP, CHR and ROD did not differ between each other for the negative symptoms, probably reflecting the effect of the psychopathology on the patients' general motivation to life.
The regressions analysis highlighted different patterns of associations of WSS and neurocognitive scores with the clinical status. In particular, the scores at the MIS, PAS and SanS combined with the Rey Figure (delayed drawing), predicted that the participants were CHR; the MIS, PAS and SAnS with measures of attention (CPT, DSST) predicted that the participant were ROP; the PAS; SAnS and short-term memory (DS) predicted to being ROD.
Discussion: Coherently with the hypotheses, different schizotypy traits or grade of severity characterized patients with distinct psychopathology profiles. Also, the association of WSS subscales with the cognitive measures differentiated between groups, with visuo-spatial long-term memory being associated to CHR, measures of attention relating to ROP and verbal short term memory relating to ROD.
This makes these measures good candidates for the upcoming machine learning analyses.

T78. LONG-TERM PROGNOSIS OF SCHIZOPHRENIA - RESULTS FROM THE NORTHERN FINLAND BIRTH COHORT 1966

Erika Jääskeläinen[1], Matti Penttilä[1], Jani Moilanen[1], Marianne Haapea[1], Anja Hulkko[1], Irina Rannikko[1], Nina Rautio[1], Tanja Nordström[1], Juha Käkelä[1], Annika Seppälä[1], Johanna Immonen[1], Hanna Korpela[1], Jussi Seppälä[1], Graham Murray[2], Hannu Koponen[3], Matti Isohanni*[,1], Jouko Miettunen[1]
[1] University of Oulu; [2]University of Cambridge; [3]University of Helsinki, Helsinki University Hospital