we considered these two groups, we found an interaction of the time of assessment by increased/decreased trajectory in the prediction of memory performance (p = .001).
Discussion: Although we did not find differences between baseline and follow-up assessments, we found two different groups with diverse trajectories. The most recent studies in SZ have discussed the existence of these subgroups in the disorder. Our results didn't showed evidence of impacts of both neurodevelopment or neuroprogression theories, the limited sample size may have influenced this. However, the two moment of assessment were with more than 10 years after the disease onset, adding to the compelling evidence that most of the cognitive deficits occur during early stages of the disorder.

T52. COGNITION, METACOGNITION AND SOCIAL COGNITION AFTER A FIRST EPISODE PSYCHOSIS. PRELIMINARY RESULTS FROM A 5-YEAR-FOLLOW-UP STUDY

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Background: Cognitive impairment is considered a core feature of psychotic disorders. Deficits in cognition, metacognition and social cognition have been reported to be correlated, and indeed predictors, of functional outcome or level of disability. Psychotic patients tend to present lower IQ and show impairment in specific cognitive domains, and in social cognition, than controls. Several studies have found deficits in facial emotion recognition (FER) and a higher prevalence of the jumping to conclusions (JTC) reasoning and data gathering biases among psychotic patients, even at time of illness onset, compared to controls. However, the trajectory of this impairment remains unclear. Only a few studies have jointly investigated longitudinally the course of neurocognitive and social cognitive deficits, emotional processing, and JTC. Therefore, this study aimed to explore long-term trajectories of IQ, JTC, and FER using 5-year follow up (FU) data.
Methods: 36 patients with First Episode Psychosis (FEP) and 70 controls from the London subsample of the EUGEI study were followed up after 5 years. Sociodemographic, clinical and neuropsychological assessments were performed at baseline and 5-year-follow-up. Current IQ was measured using WAIS III short form, JTC bias through the 60:40 beads task, and FER using Degraded Facial Affect Recognition (DFAR) task. In STATA 15, repeated measures ANOVA was used to analyse changes between baseline and follow up scores.
Results: Mean IQ scores for patients were 88.4 (20) at baseline and 92.6 (SD 17.9) at FU. For controls, IQ scores were 104.5 (SD 18.4) at baseline and 108.9 (SD 19.5) at FU. For patients, mean number of beads was 3.9 (SD 4) at baseline and 3.2 (SD 3.4) at FU, while controls decided after 6.3 (SD 4.6) beads on average at baseline and 6.5 (SD 3.2) at FU. For patients, mean DFAR scores were overall [baseline: 72.5 (SD 16); FU: 72.4 (SD 18.1)], neutral [baseline: 79 (SD 19.1); FU: 76.5 (SD 24.3)], happy [baseline: 86.9 (SD 16.9); FU: 88.4 (SD 18.9)], fearful [baseline: 51.3 (25.6); FU: 54.2 (SD 20.9)], angry [baseline: 72.8 (24.3); FU: 70.4 (26.9)]. For controls, mean DFAR scores were overall [baseline: 76.3 (SD 8.6); FU: 75.4 (SD 8.7)], neutral [baseline: 82.2 (SD 12.8); FU: 84.9 (SD 13.1)], happy [baseline: 93 (SD 7.9); FU: 90.7 (SD 8.5)], fearful [baseline: 60.5 (18.1); FU: 58.1 (SD 20.3)], angry [baseline: 69.5 (19.5); FU: 58.1 (20.3)]. Repeated-measures ANOVA showed that patients scored significantly lower than controls on: IQ [$F(1,103) = 22.6$, $p < 0.001$], beads task [$F(1,104) = 12.5$, $p = 0.0006$], DFAR overall [$F(1,101) = 6.94$, $p = 0.0096$], DFAR neutral [$F(1,101) = 10.36$, $p = 0.0017$], DFAR happy [$F(1,101) = 7.88$, $p = 0.0059$] and DFAR fearful [$F(1,101) = 5.45$, $p = 0.0213$]. There was a significant effect of time for IQ scores [$F(1,103) = 19.4$, $p > 0.001$], but no time*group interaction. There was no significant main effect of time or time*group interaction for beads task and all DFAR scores.
Discussion: In line with previous literature, lower IQ was found in the patients group, both at baseline and 5-year-follow-up. Likewise, jumping to conclusion bias and facial emotion recognition impairments were prominent in patients compared to controls. Preliminary Results: pointed out small yet significant improvement in current IQ for both groups. Nonetheless, JTC bias and deficits in recognising emotional facial expressions were found to be steady along the course of the illness. Further research is warranted to examine the association between those impairments and functional outcome.

T53. NEUROPHYSIOLOGICAL AND BEHAVIORAL EFFECTS OF THE STIMULATION OF NICOTINIC RECEPTORS AND NON-INVASIVE BRAIN STIMULATION IN PATIENTS WITH SCHIZOPHRENIA: STUDY DESIGN AND METHODOLOGY OF A RANDOMIZED CONTROLLED TRIAL

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Background: Tobacco dependence is the most common substance use disorder in schizophrenia patients. Research suggests that prevalence rates for patients with schizophrenia are 40 to 80 percent. It is believed that these patients smoke to improve cognitive deficits. This assumption is supported by several neurophysiological and behavioral studies. The aim of the current study is to assess the physiological fundamentals and the behavioral effects of smoking in patients with schizophrenia.
Methods: The present randomized double-blind and controlled study is ongoing and focusses on enhancing cognitive functioning in schizophrenia patients. Nicotinic receptors of participating patients are stimulated by the substance varenicline. The resulting changes are assessed by non-invasive brain stimulation (NIBS) and cognitive performance tests. Additionally, anodal transcranial direct current stimulation (a-tDCS) is applied for inducing plasticity to examine the interaction between tobacco consumption and brain stimulation. The treatment consists of twice daily 1 mg of varenicline (or placebo) and 20-minute a-tDCS (or sham tDCS) over a period of five days. Sixty patients with schizophrenia will be recruited for this pilot study.
Results: This is a double-blind study. Therefore no results can be shown so far. To this date 18 patients have been recruited (female = 6). There haven't been major side effects and patients are tolerating the interventions well.
Discussion: During the conference we will present the concept and design of the combined "varenicline x tDCS" trial for the treatment of cognitive deficits in schizophrenia.

T54. EFFECTS OF GAMMA TRANSCRANIAL ALTERNATING CURRENT STIMULATION TO THE LEFT DORSOLATERAL PREFRONTAL CORTEX ON WORKING MEMORY IN SCHIZOPHRENIA PATIENTS

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Background: Working memory (WM) impairment is characteristic for schizophrenia patients, lowering their occupational status and quality of life. Recent research suggests that non-invasive brain stimulation could have the potential to treat such cognitive deficits. One novel and promising approach is the transcranial alternating current stimulation (tACS) that could entrain the endogenous gamma oscillations in the dorsolateral prefrontal cortex (DLPFC), previously shown to be abnormal in schizophrenia patients and associated with WM deficits. Indeed, first studies demonstrated WM improvement in healthy participants following tACS at the gamma frequency (γ-tACS) to the DLPFC in healthy participants. However, till date, there is only one pilot study with ten schizophrenia patients, where cognitive enhancement was not evident. Here, we aimed to investigate the efficacy and feasibility of γ-tACS on simultaneous WM performance in schizophrenia patients with a bigger study sample and in regard of cognitive load
Methods: A total of fifteen patients with schizophrenia (N = 15, 8 female) participated in the current study. They underwent a pre-stimulation baseline, an active γ-tACS and a sham single-session in a double-blind, crossover design. Stimulation was administered over the left DLPFC (F3, anode) and the contralateral region (F4, cathode) at a current of -1mA to 1mA (peek-to-peek) at 40 Hz for 20 min (48000 cycles). We assessed WM during stimulation using a verbal n-back task with three cognitive loads (1- to 3-back). Reaction times and discriminability index d prime served as primary study outcomes. Using several RM-ANOVAs, we compared working memory performance during γ-tACS and sham across all cognitive loads.
Results: Data analysis showed no significant main effect of γ-tACS compared to sham on both d prime values ($p = .269$) and reaction times ($p = .166$). However, we observed a significant stimulation x load interaction effect on reaction times ($p = .043$), suggesting that with increasing cognitive load participants responded slightly slower during active than during sham γ-tACS.
Discussion: The current work is one of the first to investigate the effects of γ-tACS to the DLPFC on simultaneous WM performance in schizophrenia patients. In line with previous research, we did not find any significant changes in cognition due to stimulation. Surprisingly, we observed a slight decrease in WM speed with higher cognitive load during active compared to sham tACS. Results are discussed in line of study protocol and tACS feasibility and emphasize the need for future research on the specific study design parameters.

T55. DETECTING SEMANTIC DISTANCE ABNORMALITIES IN PSYCHOSIS: QUANTIFICATION OF WORD ASSOCIATIONS USING SEMANTIC SPACE MODELING

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Background: Language Disorganisation is central to the conceptualization of psychosis. Disruptions in semantic processing have been observed both as a "state", and a "trait" phenomena in psychotic disorders. Quantification of semantic abnormalities have been improved with recent advances in semantic modeling. The current study applied such computational methods on a word association task, using immediate response to cue words to explore semantic associations. We employed a longitudinal design to investigate semantic relationships during a psychotic episode compared with the same patients after remission six months later, in order to clarify the state-trait status of the semantic variables, and their relationships with clinical symptoms. We hypothesized that semantic distance would be significantly greater in patients than controls at baseline, and would decrease upon follow-up.
Methods: A continued word association task (WAT) was employed to elicit three associations per cue from a set of 200 cue-words. The set of cues were previously established as being representative of words in general speech, in terms of valence, concreteness and part-of-speech composition. The task was administered to 47 patients with schizophrenia spectrum disorders and 44 matched healthy control participants. Data was collected at two time points, at baseline when patients were actively psychotic and then at 6-months follow-up. In addition, extensive clinical and cognitive measures were collected at both time points. Patterns of word associations were explored using vector representations, derived from Word2Vec, that encompass semantic meaning. Semantic distance of each cue-response pairing is defined using the cosine angle of their vectors. Changes in semantic distance were further examined on their correlation with symptom change over time.
Results: There was a significant interaction between group and time point on semantic distance ($F = 6.865$, $p = 0.009$), where measures of the semantic distance of patients' responses were significantly greater than healthy controls at both time-points ($p < 0.001$).There is a significant time effect: the semantic distance reduced significantly over time ($p < 0.001$). Within the patient group, a change in semantic distance was correlated with symptom change over time, specifically with general psychopathology ($p = 0.024$), depressive ($p = 0.046$) and manic symptoms ($p < 0.01$).
Discussion: Measures of semantic distance were significantly greater in patients both at baseline during a psychotic episode, and at follow-up upon clinical remission. There is a significant but not full normalization of semantic distance upon remission. Increase in semantic distance is therefore both a state and a trait marker in psychosis. We have employed a novel technique to quantify semantic distance of a word association task using Word2Vec to generate vector representations of responses in a high-dimensional semantic space. The findings illustrate the feasibility of applying Word2Vec to a word association task to detect subtle changes in language. Subsequent research possibilities using this approach includes exploration of the semantic content of responses, by grouping similar meaning responses into conceptual clusters, and its correlation with symptom change.

T56. RISKY DECISION-MAKING IMPAIRMENT IN EARLY-STAGE PSYCHOTIC BIPOLAR DISORDER

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Background: Previous research suggests that bipolar disorder may be associated with increased risk-taking / impulsivity. Risky decision-making paradigm is an objective, performance-based measure which has been increasingly applied in bipolar disorder research examining. Nonetheless, literature focused only on chronically ill samples, with illness chronicity, clinical heterogeneity and prolonged medication exposure being potential confounding factors of study results. The current study aimed to explore whether patients with early-stage psychotic bipolar disorder (BDP) exhibit impaired risky decision-making relative to healthy controls, using a well-validated, widely-applied experimental paradigm of Balloon Analogue Risk Task (BART).
Methods: Thirty-nine patients with early-stage BDP (defined by having received psychiatric treatment for first-episode BDP within 3 years since service entry) and 36 demographically matched healthy controls were recruited. BART was administered to examine risky decision-making performance. Deliberative risky behavior was operationalized as the willingness to inflate balloons as each pump was accompanied by an extra point gained in the temporary repository or balloon explosion. Three performance-based indices (adjusted score, explosion rate and cumulative score) were derived and analyzed.
Results: There were no significant differences between patients and controls in age, gender and educational levels. Independent samples t-tests illustrated that