relatively understudied. Our recent data provided evidence for disruptions in the attention-related electrophysiological responses among individuals following their first psychotic break (FESz). Specifically, FESz exhibited reduced amplitudes of the N2pc component compared to healthy controls (HC) during a target detection task. The present investigation additionally used the magnetoencephalography (MEG) data that had been simultaneously recorded during selective attention task performance to identify disruptions in source-resolved cortical regions underlying the N2pc impairment.

Methods: MEG and EEG were simultaneously recorded from 22 first-episode schizophrenia spectrum (FESz) and 22 healthy control (HC) individuals during two target detection tasks that required different degrees of top-down attentional control; pop-out and visual search. MEG and EEG sensor locations were coregistered with structural MRI scans for each participant and the boundary element method was used to model the forward solution. The inverse solution for cortical activity contributing to the N2pc signal (275 – 325ms post stimulus) was then derived using the noise covariance matrix calculated from the baseline period of each trial. BA7, BA39, and BA37 were selected a priori as regions of interests (ROIs) based on previous investigations of N2pc sources. Average activity during the N2pc time window was compared between groups using a 2 (task condition) x 2 (group) x 3 (ROI) ANOVA.

Results: A significant interaction between group and task condition was observed ($F1,42=5.3$, $p=.03$). HC exhibited marginally increased activity during pop-out compared to FESz ($t42=1.86$, $p=.07$) despite a statistically equivalent level of activity during visual search ($t42=-0.86$, $p=.39$). There were no main effects of group ($p=.54$), task condition ($p=.90$), or ROI ($p=.94$). Nor were there interactions between ROI and group ($p=.81$) or ROI and task ($p=.16$). Whereas no correlations between ROI activity and N2pc were observed among FESz (p's>.05), larger BA37 during visual search activity was associated with larger N2pc scalp amplitudes in HC ($r=-.65$, $p=.001$).

Discussion: In contrast to the simple group difference in N2pc amplitude recorded from the scalp, examination of the cortical dynamics contributing to this response revealed a differential effect of task condition between groups. FESz exhibited reduced activity relative to HC on target pop-out trials compared to those requiring a top-down, serial search of potential target stimuli. While this finding appears counterintuitive, it may reflect a hyperfocusing of attention on distractor stimuli in our FESz group recently described in a study of individuals with schizophrenia. This mechanism would explain the relative preservation of attention-related cortical activity in FESz during a task with increased distractor interference. The difference between our sensor-level N2pc results based on EEG recordings and our source-level cortical activity derived from simultaneously recorded EEG and MEG speaks to the importance of utilizing complementary imaging modalities to enrich our understanding of processes involved in complex cognitive functions.

O8.6. IS JUMPING TO CONCLUSIONS BIAS ASSOCIATED WITH FREQUENT "JUMPING" TO SALIENCE-RELATED FUNCTIONAL BRAIN STATES?

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Background: Delusion is a false belief with strong conviction and incorrigibility. It is well documented that people with delusions and schizophrenia show the jumping to conclusions (JTC) bias, which means patients need less evidence for judgment than healthy people. Recently, JTC bias is indicated to be associated with aberrant salience in schizophrenia (Speechley et al, 2010). However, its neural representation is unknown. In this study, we employed the beads task, which measures JTC, and resting-state functional magnetic resonance imaging (rsfMRI) to reveal the neural correlates of the association between JTC bias and aberrant salience in patients with schizophrenia.

Methods: Forty-one patients with schizophrenia (SCZ) and 34 healthy controls (HC) were recruited. All participants performed the beads task in the following procedure: subjects were presented with two jars containing 80 blue / 20 yellow and 20 blue / 80 yellow beads, respectively. Beads were drawn from one of the jars repeatedly with replacement, and subjects were told to decide from which of the two jars the beads were drawn. The number of draws needed to decision (DTD) was used as the index of JTC bias. The rsfMRI data were acquired from all the subjects on a Siemens 3T scanner, preprocessed by independent component analysis (ICA)-based denoising (Aso et al, 2017), and analyzed by group ICA implemented in FSL. Nine independent components (ICs) were identified as the networks of interest (NOIs) based on previous literature: the anterior, posterior, and ventral default mode networks (DMNs), left and right central executive networks (CENs), salience network (SN), medial temporal lobe network (MTLN) and basal ganglia network (BGN). The time-courses of these 9 ICs were analyzed by the Energy Landscape Analysis (ELA: Watanabe et al, 2013; Ezaki et al, 2018). ELA utilized pairwise maximum entropy model and Boltzmann machine to calculate "energy" of brain activation patterns (states), and created an energy landscape, which represented frequency of brain states. Transition rate between low-energy, stable states and high-energy, unstable states was calculated, and the effect of DTD and diagnosis and interaction between them on the transition rate were tested, with age, gender, IQ and temporal signal-to-noise ratio of rsfMRI data as covariates.

Results: Low-energy, stable states were characterized by activation and deactivation of almost all NOIs, while high-energy, unstable states were characterized by activation and deactivation of salience-related NOIs. A significant interaction was found between DTD and diagnosis ($p<0.05$, FWE), indicating smaller DTD was correlated with more frequent transition between low and high energy states in SCZ patients, while larger DTD was correlated with more frequent transition in HC subjects.

Discussion: This study revealed dynamic neural correlates of JTC bias and its association with aberrant salience in schizophrenia. These findings elucidate the pathway how aberrant salience in schizophrenia lead to psychotic symptom such as delusion.

O8.7. STIMULATING THE BRAIN TO IMPROVE INTROSPECTIVE ACCURACY IN SCHIZOPHRENIA

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Background: Introspective accuracy (IA) refers to the ability to accurately assess one's own skills and capabilities. Recent work provides evidence that IA deficits in schizophrenia that are predictive of everyday functioning and has demonstrated reduced activation for patients in right rostrolateral prefrontal cortex (rlPFC), a region thought to be critical for successful IA. Together, these findings suggest that increasing activity of the rlPFC in individuals with schizophrenia may result in improved IA, which may then lead to better functional outcomes. The current study aimed to directly test this hypothesis by using transcranial Direct Current Stimulation (tDCS) to increase activity in the rlPFC in individuals with a diagnosis of schizophrenia or schizoaffective disorder.

Methods: Thirty-five participants completed two brain stimulation sessions (one active and one sham) approximately one week apart. Active stimulation occurred at 1.5mA for 20 minutes. The sham condition included 5 seconds of stimulation at 1.5mA that was then discontinued for the remainder of the session. In both conditions, the anode was placed immediately over the right rlPFC, with the cathode placed on the left bicep. After each session, participants performed neurocognitive (i.e. Wisconsin Card Sorting Task; WCST) and social cognitive (i.e. emotion recognition; ER40) tasks that were modified to allow for assessments of IA. Participants also completed

a novel emotion recognition task that utilizes a signal detection framework to allow for measurement of IA while controlling for task difficulty.
Results: Paired samples t-tests indicated that overall task accuracy on both the WCST and ER40 did not differ across stimulation conditions (ps>.77). IA was calculated for the WCST and ER40 tasks by obtaining a type 2 ROC (receiver operating characteristic) curve and computing the area under this curve (AUROC2). Paired samples t-tests failed to reveal any improvement in IA during active stimulation as compared to the sham condition for either ER40 (active mean: 0.57; sham mean: .53; t(34)=.76, p=.46) or WCST (active mean: 0.56; sham mean: .53; t(34)=.01, p=.99). Data analyses for the novel emotion recognition task are underway.
Discussion: These preliminary findings indicate that stimulation of right rlPFC via tDCS does not improve introspective accuracy abilities in patients with schizophrenia spectrum illnesses. It is possible that greater durations of stimulation or repeated stimulation sessions are required to promote behavioral change. However, given the strong links between rlPFC and IA, continued attempts to increase neural activation with these regions seems warranted.

O8.8. THE NEURAL DYNAMICS OF BELIEF FORMATION: IMPAIRMENTS SPECIFIC TO THE SCHIZOPHRENIA SPECTRUM AND FEATURES THAT ALIGN ON THE PSYCHOSIS CONTINUUM

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Background: Recent theories in computational psychiatry have proposed that unusual perceptual experiences and delusional beliefs in psychotic disorders may emerge as a consequence of aberrant inference and disruptions in prediction error updating. The current study investigates anomalies in belief formation and updating that are specific to the schizophrenia spectrum. Furthermore, we examine psychosis as a continuum, which extends into the non-clinical population, and investigate anomalies that align on the continuum of psychosis. We characterised the underlying neural dynamics of impaired belief formation, or 'regularity learning' in stable and volatile contexts.
Methods: 66 participants (22 inpatients with a schizophrenia spectrum disorder (SZS), 22 non-psychotic inpatients (NP), and 22 non-clinical controls (NC)) completed an auditory oddball task with volatility manipulated. The psychosis continuum in our sample was measured using the Community Assessment of Psychic Experience Questionnaire. We recorded prediction error responses with electroencephalography and behaviorally measured regularity learning errors to inferences on the probability of sounds presented within stable and volatile contexts. Furthermore, we explored how the neural dynamics relate to psychotic experiences using Dynamic Causal Modelling.
Results: Attenuated prediction error responses were specifically observed in the SZS but not in NP group, with reductions in mismatch negativity (MMN) in stable, and P300 in volatile contexts. Attenuation in P300 was related to poorer regularity learning and psychotic experiences across the whole sample. Whole-brain source reconstruction showed decreased activity for P300 prediction errors in SZS compared to NC in the medial frontal gyrus, insula and primary auditory cortex (A1); and for SZS compared to NP in the right superior temporal gyrus (STG). Further, we explored the effective connectivity differences between these regions, which also capture the know auditory prediction error network architecture. Dynamic Causal Modelling with Parametric Empirical Bayes analysis revealed stronger left A1 intrinsic connectivity in the SZS compared to the NP group, which was also related to better regularity learning. Furthermore, people that experienced more hallucinations and general psychotic-like symptoms had decreased intrinsic connectivity in the right IFG, which was also found to be related to poorer regularity learning.
Discussion: The findings provide evidence that reductions in auditory prediction error signaling is specific to the schizophrenia spectrum, related to attenuation in MMN and decreased activity in superior temporal gyrus. However, the results also support the notion of the psychosis continuum, with psychotic experiences across the three groups being related to poorer regularity learning and decreases in P300, suggesting a weaker prediction model of sensory probabilities. Weaker right IFG intrinsic connectivity may underlie impaired prediction formation, in patients experiencing hallucinations, and people within the general population who also experience psychotic-like symptoms. We suggest that increased intrinsic left A1 connectivity may play a compensatory role in SZS compared to other patient groups during regularity learning.

O9. ORAL SESSION: BIOLOGICAL AND PSYCHOSOCIAL INTERVENTIONS: TREATMENT STRATEGIES AND POTENTIAL OUTCOME MEASURES

O9.1. PROSPECTIVE MEMORY AND THE RELATIONSHIP TO SOCIAL FUNCTION AND NEGATIVE SYMPTOMS IN CLINICAL HIGH RISK, FIRST EPISODE PSYCHOSIS, AND SCHIZOPHRENIA

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Background: Thought to be essential for daily functioning, prospective memory (PM) deficits were found in both adults with established psychosis (Schizophrenia; SCZ) and younger adults recently diagnosed with SCZ (First Episode Psychosis; FEP). Examined further, time-based PM appeared to be more impaired than event-based PM, which may contribute toward various negative symptoms including social withdrawal. It remains unclear if similar PM deficits present at an earlier, prodromal stage of psychosis such as teenagers at clinical high risk for psychosis (CHR) and how they may correlate with negative symptoms and social functioning.
Methods: Participants included 25 teenagers at CHR (16-19yo), 22 young adults with FEP (18-21yo), 42 adults with SCZ (21-55yo), and 29 healthy controls (18-24yo). This cross-sectional assessment included the Cambridge Test of Prospective Memory (CAMPROMPT), Scale of Psychosis-risk Symptoms (SOPS), PANSS, Specific Levels of Functioning Assessment (SLOF), Social Adjustment Scale (SAS), and the Continuous Performance Test-Identical Pairs (CPT-IP). Differences were calculated using pairwise comparisons (Tukey test).
Results: CHR performed worse on time-based PM compared to healthy controls (F=2.45, p=0.01) while event-based PM was found to still be relatively intact. Compared to FEP and SCZ, CHR presented with similar time-based PM impairment to FEP, but it was not as severe as SCZ. These time-based PM impairments mirrored performances in attention, as CHR and FEP had similar attentional impairments compared to health controls (F=2.18, p=0.03), but again, not as severe as SCZ. Interestingly, across all three groups, while time-based PM was more impaired, it was event-based PM that was related to negative symptoms (r's>-0.23, p's<0.41) and social function (r's>0.26, p's<0.27).
Discussion: Findings support earlier studies that PM deficits can be present at a much earlier stage of psychosis, with time-based PM more impaired than event-based PM. Additionally, deficits in event-based PM were significantly correlated with negative symptoms and social functioning.