

second experiment, we examined event-related potentials (ERPs) recorded during the same contour perception task in PSZ, HCs, as well as people with bipolar affective disorder (PBP) and first-degree biological relatives of PSZ (RelPSZ), which allowed us to examine the diagnostic specificity of perceptual abnormalities.

Results: Source signals revealed PSZ to exhibit diminished delta and theta frequency responses in visual cortex. HCs showed theta responses to the contour within visual areas V1 and V3 that were lateralized (contralateral to the visual field where the contour appeared), while PSZ failed to show such lateralization. HCs also had theta responses to the contour that were modulated by the perceptual context created by surrounding stimuli, while this theta modulation was absent in PSZ. Interestingly, PSZ who had stronger contextual modulation of theta in V1 tended to better discern the contours, and PSZ who more strongly modulated theta in V3 reported more unusual perceptual experiences in their daily lives. In the second experiment, contextual modulation of brain responses was absent in the early brain responses (P1 and N1 ERPs prior to 200 msec) for all groups. The P2 ERP response (240 msec), recorded over lateral occipital regions, was significantly modulated by perceptual context, but this modulation was weaker for both PSZ and RelPSZ. These similar aberrations suggest that genetic liability for schizophrenia is associated with diminished suppressive functions in visual cortex involved in visual context processing.

Conclusions: In sum, multimodal imaging and electrophysiological data provide evidence that initial registration of visual stimuli is specifically aberrant in schizophrenia. Diminished effects of perceptual context during contour detection may reflect genetic liability for schizophrenia and is apparent in biological relatives of individuals with this disorder. Additionally, low-frequency oscillations within visual cortex may reflect the pathophysiology of abnormal visual perception in schizophrenia.

16.3 ARE VISUAL MOTION PERCEPTION AND DETECTION OF ANIMACY CRITICAL TO HIGHER-ORDER SOCIAL COGNITIVE FUNCTION IN SCHIZOPHRENIA?

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Background: The observation that individuals with schizophrenia tend to misinterpret subtle social cues is often attributed to deficit in Theory of Mind (ToM). While ToM is commonly assessed using videos portraying interaction between actors, recent work in vision science shows that stimuli with no innate animate features can also convey similar social information through motion alone. These simplified stimuli are advantageous for experimental purposes and may provide further insights into perceptual mechanisms supporting social cognitive function. The Social Attribution Task-Multiple Choice (SAT-MC), based on the classic Heder and Simmel (1944) stimuli, tells a story using three geometric shapes moving about a centrally fixed figure, followed by questions about what the viewer observed. Although there are no explicit social cues, viewers typically detect actions suggestive of relationships between objects, their intentions, and emotions. This talk will present findings from three studies examining psychometric, functional, and neurophysiological aspects on SAT -MC performance in schizophrenia.

Methods: Study 1 examined psychometric properties of two forms of the SAT-MC in comparison to video-based social cognitive tests using human actors in 32 schizophrenia (SZ) and 30 substance use disorder (SUD) participants. Study 2 examined functional relationships of the SAT-MC and affect recognition (BLERT) performance across neurocognitive, metacognitive, ToM, and symptom domains in 72 adults with SZ. Study 3 is an in-progress investigation of neurophysiological mechanisms of social cognition using test versions adapted for EEG recording. Chronic SZ, clinical

high-risk (CHR), and healthy age-matched community samples are being collected.

Results: SZ scored significantly lower than SUD on two versions of the SAT-MC, each classifying ~60% of SZ as impaired, compared with ~30% of SUD. The two SAT-MC forms demonstrated good test-retest and parallel form reliability, minimal practice effect, high internal consistency, similar patterns of correlation with social cognitive test performance, and compared favorably to social cognitive tests across psychometric features. When examining functional correlates of SAT -MC performance, impairment is found to co-occur with deficits in affect recognition in the majority of cases but relates uniquely to reductions in verbal memory and emotional intelligence measures. Finally, a preliminary analysis (n=8 SZ, n=2 CHR) of EEG collected during SAT-MC video presentation finds significant correlations ($r=.66-.72$) between occipito-parietal gamma desynchronization and task performance. Additional analyses find task-related EEG during SAT to be predictive of affect recognition (BLERT) and ToM (TASIT) performance, with correlates including alpha desynchronization in frontal, occipital, and temporal regions, and synchronization of temporal theta and occipital gamma (all $r > .5$).

Conclusions: SAT-MC performance is found to be reliable using different stimuli, related to affect recognition and ToM in three independent samples, and shows high diagnostic specificity in classifying SZ against a SUD sample. Functional correlates also involve encoding and emotional intelligence abilities tested outside the visual modality. Analysis of neural oscillatory activity related SAT-MC performance to visual and attention processes, as well as engagement of a broader social cognitive network applied to affect recognition and ToM tasks. Impairment in visual motion processing appears integral to schizophrenia pathophysiology and a critical factor influencing social cognitive abilities attributed to higher-order ToM ability.

16.4 VISUAL DISTURBANCES UNDERLIE ABNORMAL EYE GAZE PERCEPTION IN PSYCHOSIS: PSYCHOPHYSICAL AND EFFECTIVE CONNECTIVITY EVIDENCE

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Background: Deficits in social cognition are pervasive in schizophrenia (SZ) and strong predictors of poor functional outcomes. Understanding of the mechanisms underlying critical social cognitive dysfunctions in SZ will advance our understanding of the disorder and help design targeted treatment. In this presentation, we examine a basic building block of social cognition—eye gaze perception—in SZ and bipolar psychosis (BP). Given the frequent documentations of visual perceptual anomaly in SZ, we specifically evaluate the role of visual disturbances in altered gaze processing in psychosis. We used psychophysics to isolate distinctive cognitive processes involved in gaze perception (Study 1) and applied dynamic causal modeling (DCM) to fMRI data to illuminate aberrant brain dynamics responsible for altered gaze processing (Study 2).

Methods: In Study 1, 157 participants (47 SZ; 55 BP; and 55 healthy controls, HC) viewed faces with varying gaze directions and made two-forced choice eye contact judgments (“yes” or “no”). In each individual, eye contact endorsement was examined as a logistic function of gaze direction. The slope and absolute threshold of this perception curve were used to index, respectively, visual perceptual sensitivity and self-referential bias. Individual measures and group differences were estimated using hierarchical Bayesian modeling. Markov Chain Monte Carlo (MCMC) implemented in WinBUGS was used to sample from the joint posterior distribution to estimate posterior probabilities of the parameters. In Study 2, 27 SZ participants and 22 HC completed a gaze perception task during BOLD fMRI. They viewed faces with varying gaze directions and made two-forced choice