showed 51% of functional activity altered (61% was hypoactivity). The ventrolateral prefrontal cortex (VLPFC) presented 28% of aberrant fMRI (75% was hyperactivity). Thalamus presented altered activity with 20% (71% was hypoactivity). The Cingulate was also altered during activation with 20% of patients (85% was hypoactivity). Finally, functional alterations of the Amygdala were present in 14% of the selected patients (80% was hypoactivation).

Discussion: This larger review suggests that there are several possible areas apart from fronto temporal pathways (Mwansisya et al., 2017), that have to be taken into account at the early course of psychosis, such as limbic system, thalamo-cortical networks and cingulate. These functional activation abnormalities seem to be different to the reported in the previous review. The different results seem to be clearly influenced by the kind of paradigm. Moreover, our finding is not in concordance with the suggestion that thalamic alterations became only prominent at the chronic phase of psychosis (Li et al., 2017).

References:

S154. THE ROLE OF DOPAMINE IN PROCESSING THE MEANINGFUL INFORMATION OF OBSERVATIONS, AND IMPLICATIONS FOR THE ABERRANT SALIENCE HYPOTHESIS OF SCHIZOPHRENIA
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Background: The aberrant salience hypothesis of schizophrenia proposes that symptoms such as paranoia arise when behavioural salience is attributed to neutral stimuli. Mesolimbic dopamine dysfunction is thought to be central to this mechanism; building on findings that activity in this pathway conveys a (signed) reward prediction error signal. Given that many psychotic symptoms are not explicitly related to reward learning, it is relevant that recent studies in rodents have demonstrated a role for midbrain dopamine neurons in value-neutral associative learning. Direct evidence for this role in humans, however, is lacking.

In this study we asked whether the mesolimbic dopamine circuit is involved in encoding the value-neutral meaningful information of observations, using a model-based functional magnetic resonance imaging (fMRI) task and dopamine positron emission tomography (PET). We define ‘meaningful information’ as the degree to which an observation results in a belief-update to an agent’s internal model of the environment (Kullback-Leibler divergence from prior to posterior beliefs; ‘Bayesian surprise’).

Methods: Participants were tasked to infer the current (hidden) state of the environment, using partially-informative observations at each trial, and then report their belief at the end of each trial. Participant beliefs were modelled using a Hidden Markov Model of the task and iterative application of Bayes’ rule, allowing us to quantify the Bayesian surprise (meaningful information content) associated with a trial observation. Crucially, our task de-correlated Bayesian surprise from both the pure sensory unexpectedness of an observation (unexpected but meaningless information) and its signed reward prediction error. 39 healthy participants (22M, mean age 26y) performed 180 task trials within an fMRI scanner. 36 participants also had a [11C]-(+)-4-propyl-9-hydroxy-naphthoxazine (PHNO) PET scan to quantify dopamine-2/3 receptor (D2/3R) availability. 17 participants additionally had a second PET scan 3hrs post 0.5mg/kg oral dexamphetamine, to quantify striatal dopamine release capacity. Neuroimaging analyses were restricted to the bilateral substantia nigra/ventral tegmental area (SN/VTA) and ventral striatum (VS).

Results: Our computational model closely predicted participant behaviour (R2=.67), and there was a negative correlation between subclinical paranoia and the degree to which participant behaviour approximated normative Bayesian performance (rho = -.60, P=0.001). Neuronal activation encoding the meaningful information content of an observation (Bayesian surprise) was present in SN/VTA and VS (both P(peak)<0.05, SVC), whereas no such encoding was present for sensory unexpectedness or reward-prediction error. Crucially, activation encoding Bayesian surprise was inversely correlated with D2/3R availability in the SN/VTA (rho = -.43, P=0.009), with a tonic inhibitory role for midbrain D2/3Rs. Moreover, activation encoding Bayesian surprise was inversely related to dopamine release capacity in the VS (rho = -.66, P=0.005), indicating that subjects with high dopamine release capacity showed blunted striatal activation in response to belief-changing information, as is also found in schizophrenia.

Discussion: We provide direct evidence in humans that a mesolimbic dopamine circuit is involved in encoding the meaningful information content of observations, distinct from its involvement in processing signed reward prediction error. These results implicate dopamine in a wider range of function than reward learning, including updating a predictive associative model of the world, and are therefore relevant for the aberrant salience hypothesis of schizophrenia.

S155. SENSORY ATTENUATION DURING AURAL STIMULUS PROCESSING IN PARTICIPANTS AT CLINICAL-HIGH RISK FOR PSYCHOSIS: EVIDENCE FROM MAGNETOENCEPHALOGRAPHY
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Background: The ability to predict the sensory feedback of self-generated stimuli against incoming sensory information is of importance to distinguish internal from external stimuli and is associated with sensory attenuation. Furthermore, it has been proposed that deficits in sensory attenuation could contribute to clinical symptoms of schizophrenia, including hallucinations and delusions, involving potential deficits in corollary discharge. The current study examined the hypothesis whether sensory attenuation is present in participants at clinical high-risk (CHR) for psychosis.

Methods: Sixty-four CHR-participants and 32 healthy controls were presented with auditory stimuli during two experimental conditions: 1) In a
We replicated previous findings of reduced SPEM perfor-
thymology underlying schizophrenia according to antipsychotics
capacity and frontostriatal FC observed in this study indicates different
Discussion:
analysis confirmed the result (control group: R²=0.032, p=0.572; first-line
and the kicer in the corresponding region was found in first-line AP group
ence=0.67, s.e.=3.21, df=33, p=1.000). Voxel-based analysis found signifi-
between the first-line AP group and the clozapine group (mean differ-
tomography.
(2000ms duration,83db) with the right-index finger and 2) In an active condition,
riple sounds elicted by a button press with the right-index finger every 4s. MEG-data were acquired with a 248-magnetometers whole-
head MEG system (MAGNES 3600 WH, 4-D Neuroimaging) at a sam-
pling rate of 1017Hz. We focussed on the M100 response during the passive
and active conditions at sensor- and source-level. A LCMV beamforming
approach was employed for source reconstruction and virtual channels
in primary auditory cortex and the left superior temporal cortex were
used further analysis of sensory attenuation effects. Condition and group
effects were tested with a cluster-based nonparametric test implemented
in Fieldtrip with a window of interest for the M100 component between
120ms-150ms.
Results:
There was a significant decrease (P =0.009) in the amplitude of
M100 component in the active vs. passive conditions across groups at
both sensor- and source-level. Interaction-effects revealed that that sen-
sory attenuation was significantly reduced in auditory cortices in the CHR
vs controls (P=0.032).
Discussion:
The current results highlight that sensory attenuation can be
studied with ASSR-paradigms and that both primary auditory and supe-
tior temporal cortices underlie this effect. Moreover, our current findings
suggest that sensory impairment is impaired in CHR-participants, suggest-
ing the possibility of impaired corollary discharge processes as a potential
biomarker for the early diagnosis and detection of schizophrenia.

S156. FRONTO-STRIAL FUNCTIONAL
CONNECTIVITY AND STRIATAL Dopamine
CAPACITY IN TREATMENT-RESPONSIVE AND
REFRACTORY SCHIZOPHRENIA

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Background:
Schizophrenia is thought to be a heterogeneous disorder and
evidences reflect categorically distinct subtypes according to the antipsy-
chotic treatment response. Altered frontostriatal functional connectivity
(FC) in schizophrenia and its correlation with antipsychotic treatment
response also suggests divergence of underlying pathophysiological mecha-
nism. Meanwhile, the observations that prefrontal activity correlates with
striatal dopaminergic function, leads to the hypothesis that the disrupted
frontostriatal FC would be related with altered dopaminergic pathway in
schizophrenia. The aim of this study was to investigate the relationship
between frontostriatal FC and striatal dopaminergic activity in patients
with schizophrenia according to the responsiveness to first-line antipsy-
chotic drug.

Methods:
24 symptomatically stable schizophrenia patients were recruited
from Seoul National University Hospital, 12 of which responded to first-
line antipsychotic drugs (first-line AP group) and 12 stable under clozapine
(clozapine group), along with 12 matched health controls. All participants
underwent resting-state functional MRI and [F18]DOPA positron emission
tomography.

Results:
There were no significant difference in the total PANSS score
between the first-line AP group and the clozapine group (mean differ-
ce=0.67, s.e.=3.21, p=0.001). Voxel-based analysis found significant
correlation between frontal FC to the left associative striatum and the kicer in the corresponding region was found in first-line AP group
but not in clozapine group or healthy control. Additional region of interest
analysis confirmed the result (control group: R²=0.032, p=0.572; first-line
AP group: R²=0.551, p=0.005; clozapine group: R²=0.108, p=0.297).

Discussion:
Different patterns of relationship between striatal dopamine
capacity and frontostriatal FC observed in this study indicates different
pathophysiology underlying schizophrenia according to antipsychotics

treatment-responsiveness. Results should be reconfirmed in prospective
manner with larger sample size in future studies.

S157. NEURAL CORRELATES OF SMOOTH
PURSUIT EYE MOVEMENTS IN POSITIVE AND
NEGATIVE SCHIZOTYPY

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Background: Both schizophrenia patients and highly schizotypal
individuals are known to perform worse in smooth pursuit eye movements
(SPEM) as compared to healthy controls with low levels of schizotypy.
However, little is known about the neural correlates of SPEM deficits
in subjects with high levels of schizotypy. In a previous study, individ-
uals with high total schizotypy levels showed reduced activation in motion
processing and other visual areas during SPEM than low schizotypal
controls. Interestingly, reduced activation in these areas is also observed in schizophrenia patients. This suggests that schizotypy
and schizophrenia overlap not only at the behavioral, but also at the
neural level. In the present study, we followed up on these intriguing
results by differentiating between negative and positive schizotypal
groups. We expected to find lower SPEM performance in both highly
negative and highly positive schizotypal individuals (HNS and HPS) as compared
to low schizotypal controls (LS). Moreover, in the schizotypy groups,
activation in the SPEM network was expected to be reduced in a simi-
lar way as previously reported for schizophrenia patients and highly
schizotypal individuals.

Methods: In this ongoing, bi-center study, 88 healthy subjects (28 HNS,
23 HPS, 37 LS) underwent functional magnetic resonance imaging (fMRI)
at 3T during a smooth pursuit task with concurrent oculographic mea-
surement. Sinusoidal targets with frequencies of 0.2 Hz and 0.4 Hz were
presented in a block design, with pursuit blocks alternating with blocks of
fixation.

Results: At the level of performance, we found an interaction between tar-
get frequency and group for the root mean square error (RMSE) of eye
position (p =0.026). This result indicates greater performance 
detriments from low to high frequency in HPS, as compared to the other two groups. At the neural level, overall activations during pursuit across the entire sample were found in brain regions known to be part of the pursuit network, i.e.
frontal and supplementary eye fields, lateral geniculate nucleus, and visual
cortex including V5. However, none of these regions displayed activation
differences between groups. With multiple regression analyses for each
of the groups, we investigated associations between cluster peak voxel activa-
tions and performance. For the low target frequency, a negative association
was found between visual area V5 in the left hemisphere and the total sac-
combe frequency during pursuit (β = –.462, p = .03). For the high target frequency,
activation in left V5 was negatively associated with RMSE in the LS group
(β = –.411, p = .01).

Discussion: We replicated previous findings of reduced SPEM perfor-
ance in highly schizotypal individuals. In addition, a negative associ-
bation between activation in area V5 and RMSE was only found among
LS, but not for the two schizotypy groups. This is in line with previous
findings of SPEM impairments in schizophrenia patients being
associated to alterations in motion sensitive area V5 and underlines
the importance of motion processing for SPEM deficits in the schizo-
phrenia spectrum. However, we also found an association between activa-
tion in V5 and total saccade rate during pursuit in HPS, suggesting
that V5 abnormalities may be restricted to negative schizotypy. Given
the relatively small number of participants in this analysis, we expect to
find broader and clearer group differences of neural mechanisms dur-
ning pursuit with larger sample sizes.