according to birth place in a major city (level 5 of a 5-level rural-urban scale), length of residence in urban location, and length of residence during three critical 5 year periods, birth - 15 years. We studied effects on our 4 psychosis phenotypes of (i) urban birth, (ii) urban living, (iii) critical times of exposure to urban environment, (iv) putative etiological risk factors, before and after adjusting for depression. We investigated associations between etiological risk factors and urban exposures. 

**Results:** We identified 2,143 (5.4%) participants above a determined cut-off for psychoticism, 2,081 (5.3%) for paranoia, 760 (1.9%) with schizotypal symptoms, and 53 (0.1%) with schizophrenia. Effects of urban exposure on our psychosis phenotypes were only revealed following adjustments for depression in our models: Urban birth was associated with Paranoia (1.46, 1.24–1.70), schizotypal symptoms (1.90, 1.48–2.42), and schizophrenia (2.30, 1.14–4.63), but not psychoticism. All four phenotypes were associated with 10–15 years of exposure to urban living, but not shorter periods. Only schizophrenia was associated with critical timings of total exposures of 1–3 years and 4–5 years during the first 5 years of life to an urban environment. There were no associations or negative associations between putative etiological factors and urban exposures.

**Discussion:** We confirmed that urban birth and living were associated with PEs and schizophrenia in this large sample of Chinese university students, but these findings only emerged after adjusting for depression. Depression is more prevalent in rural Chinese samples and previous studies may have been confounded by effects of PEs secondary to depression. There was a gradient of association between paranoia, schizotypal symptoms and schizophrenia, the latter showing strongest effects in association with urban exposures of birth and length of time in an urban environment. Only schizophrenia showed effects of critical timing of exposure to urban environment during infancy. Finally, we could not identify what exposures in the urban environment contributed to psychosis in our sample - although we could identify the etiological factors that did not. Among Sichuan students, there was no indication that urban effects were due to increased risk from demographic factors of male sex, lower family income, increased genetic risk, or child maltreatment, although these factors showed some effects on psychosis across the entire sample which included previous rural residents.

### M133. DISCRIMINATION PHENOMENA AND THE LEVEL OF SCHIZOTYPY

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**Background:** Several have suggested a link between discrimination phenomena and psychotic disorders. Since this is a potentially modifiable factor, it seems important to clarify the links between discrimination and psychotic disorders. In the hypothesis of the psychotic continuum, schizotypal features in the general population are intermediate phenotypes in schizophrenia studies. In this study, the aim was to study the links between discrimination and level of schizotypy in the general population. We assumed that exposure to discrimination experiences is associated with increased levels of schizotypy.

**Methods:** Subjects from the general population (N = 1456), without psychotic disorders, were recruited in 17 cities and 6 countries (Brazil, Spain, France, Holland, Italy, UK). Each subject completed the Community Assessment of Psychic Experiences (CAPE), a autoquestionaire considered to assess the level of psychometric schizotypy (with positive, negative and depressive dimensions) and the 20-item Perceived Discrimination Scale developed by Williams et al. Linear regression analyzes were used with discrimination as an explanatory variable and CAPE scores as variables to be explained.

**Results:** We show that an increase in the perceived discrimination score was associated with significantly higher levels of schizotypy, in the positive (p = 1.7.10-10), negative (p = 3.4.10-10) and the depressed dimensions (p = 2.1.10-10). In more than half of the subjects who reported discrimination experiences, the reason for the discrimination invoked was not one of the reasons given. Ethnicity remains, however, a major cause of reported discrimination.

**Discussion:** The stress-vulnerability model could explain the link between discrimination and schizotypy, though dysregulation of the hypothalamic-pituitary axis and cortisol secretion in subjects with schizotypy, preventing them from responding adaptively to social stress. Psychological and social factors also seem to play a role in stress management.

### M134. MISMATCH NEGATIVITY IS REFLECTIVE OF DISEASE PROGRESSION RATHER THAN SYMPTOMATIC RECOVERY IN FIRST-EPIISODE PSYCHOSIS

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**Background:** Whether mismatch negativity (MMN) is associated with clinical status or reflects the disease progression in first-episode psychosis (FEP) patients has not been established. We aimed to investigate whether the change in MMN impairment fluctuates with the change in clinical status during 1-year.

**Methods:** MMN and the clinical status of 25 patients with FEP were measured at baseline and reassessed after 1 year. MMN of 25 matched healthy controls (HCs) were measured at baseline. Repeated-measures analysis of variance (ANOVA) was used to compare MMN at baseline among the groups, and paired t-tests were utilized to compare baseline and 1-year MMN amplitude of FEP. To identify the association between MMN impairment change and symptomatic, cognitive or functional change during 1-year, this study used multiple regression analysis controlling possible confounders.

**Results:** MMN amplitudes at baseline were significantly attenuated in FEP patients compared to HC. One-year follow-up MMN amplitude decreased significantly at Fz electrode site in FEP group. Also, the change in MMN amplitudes significantly correlated with the worsened TMT-B but did not with the symptomatic or functional recovery.

**Discussion:** These results suggest that MMN impairment may be more closely related to cognitive deficits reflecting disease progression than the currently apparent symptoms and functional status during the beginning of a psychotic episode. Future studies are needed to elucidate the relationship with the disease pathophysiology of psychosis and MMN.

### M135. DEVELOPMENT OF VISUAL SCANPATH PATTERN ANALYSIS BASED ON FACIAL EMOTION PERCEPTION ENHANCEMENT TRAINING PROGRAM IN SCHIZOPHRENIA PATIENTS

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**Background:** Facial expression is an important non-verbal way of expressing the person’s emotional state. If the process of perceiving facial features is impaired, the ability to recognize the emotional state of others is degraded, which may make it difficult to maintain interpersonal and social communications. Many studies have reported on the association between deficit of facial emotion perception (FEP) and the social functioning in schizophrenia. Therefore, we developed visual scanpath pattern analysis based FEP enhancement training program in schizophrenia.
Methods: We enrolled patients visited and admitted Gongju National Hospital and those lived in shared housing facilities for rehabilitation from Sep 2018 to May 2019. 128 patients attended to FEP training program as open, blind and randomized-controlled cross-over design. Both FEP training and mock programs were provided twice a week for a month treatment period with a 4-week washout period between treatment periods. Primary outcome was results of heatmaps based on visual scanpath patterns.

Results: Among 128 patients, 121 completed the study and 7 was dropped out. In FEP training group, their visual scanpath pattern somewhat closer to normal than mock group. When they had an efforts to perceive the emotion of face pictures, FEP training group tended to scan the face pictures more broadly including eye rims, middle of forehead and sided of the mouth in addition to eyes, nose and mouth whereas mock group tended to gaze eyes, nose and mouth intensively.

Discussion: This FEP training program may improve the ability to integrate facial expression cues through visual scanpath pattern changes in schizophrenia patients.

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M136. PSYCHOSIS POLYRISK SCORE (PPS): IMPROVING DETECTION OF INDIVIDUALS AT-RISK AND PREDICTION OF CLINICAL OUTCOMES
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Background: Primary prevention in Clinical High Risk for psychosis (CHR-P) can ameliorate the course of psychotic disorders. Further advancements of knowledge have been slowed by the standstill of the field, which is mostly attributed to its epidemiological weakness. This underlies the limited identification power for at-risk individuals and the relatively modest ability of CHR-P interviews to rule-in a state of risk for psychosis. One potential avenue for improving identification of individuals at risk for psychosis is a Psychosis PolyRisk Score (PPS) integrating genetic and non-genetic risk and protective factors for psychosis. The PPS hinges on recent findings that risk enrichment in CHR-P samples is accounted for by the accumulation of non-genetic factors e.g. parental and sociodemographic risk factors, perinatal risk factors, later risk factors, and antecedents.

Methods: A prototype of the PPS has been developed encompassing 26 non-genetic risk and protective factors, utilising Relative Risks (RR) from an umbrella review of risk and protective factors for psychosis onset in the general population. This was combined with prevalence data to ensure positive scores indicated increased psychosis risk and negative scores indicated decreased psychosis risk. To pilot this, patients referred for a CHR-P assessment (n=15) and healthy controls (n=66) were recruited and assessed with the PPS. Additionally, to investigate the range and distribution of these scores in the general population, 10,000,000 permutations were run utilising prevalence data to produce a simulated dataset.

Results: In the simulated general population data, scores ranged from -15 (least risk, equivalent RR = 0.03) to 35.9 (highest risk, RR = 8912.51). 50% of individuals had an RR < 1 (PPS < 0), 26.7% of individuals had an RR > 3 (PPS > 5), and 2.7% RR > 30 (PPS > 15). Patients referred for a CHR-P assessment had higher PPS scores (median=9, IQR=12.75) than healthy controls (median=-1.75, IQR=8.875). PPS scores in the simulated general population dataset (median=0, IQR=9.5) were similarly lower than patients.

Discussion: The PPS has potential for improving identification of individuals at risk for psychosis. Its distribution in a simulated general population is reflective of expected psychosis risk, with the vast majority of people not being at-risk and very few being at high risk. In addition to supplementing current assessments for CHR-P, this could be implemented at an earlier stage to stratify individuals based on psychosis risk and inform prognoses and clinical decision-making. This promise warrants further research to ascertain its prognostic accuracy and optimal thresholds for clinical intervention.

M137. HIGH CONFIDENCE FOR VISUOMOTOR ACTION RECRUITS THE VENTRAL STRIATUM – A METACOGNITIVE APPROACH FOR UNDERSTANDING NEGATIVE SYMPTOMS?
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Background: Metacognition refers to the ability to discriminate between one’s own correct and incorrect decisions, thus representing a key function for goal-oriented behavior. The neurobiological underpinnings of metacognition have mainly been studied in perceptual decision-making and memory-related processes; therefore, mechanisms and neural correlates underlying metacognitive processes during visuomotor actions are still poorly characterized and the specific role of confidence remains to be elucidated. This is of particular interest as deficits in goal-directed behavior and insight both are a hallmark of the negative symptoms of schizophrenia.

Methods: We examined 31 healthy controls who were asked to draw straight reaching trajectories towards a visual target, while measuring their brain activity with functional Magnetic Resonance Imaging (fMRI). Deviations were introduced in 70% of the trajectories seen on the screen. Participants then reported awareness of deviations (first-order), followed by (second-order) confidence in their response. The amount of deviation was titrated to reach a 71% average detection rate using an adaptive staircase procedure. Metacognition was measured using the M-Ratio, which estimates the ratio of first-order information available for confidence computation (Maniscalo & Lau, 2012). Whole brain activity was analyzed via a parametric general linear model (GLM).

Results: Participants showed good metacognitive abilities at evaluating the correctness of their first-order responses (M-Ratio: 0.98±0.25). Movements were decomposed into two phases based on peaks in the variance of the trajectory deviation and actual joystick position. We found that confidence ratings after deviated trials were explained by a combination of the trajectory deviation in the initial phase (p=0.006; linear mixed model) and the amount of motor correction in the final phase of the movement (p<0.001). At the neural level, as expected, conscious detection of deviation engages strongly the visual cortex, whereas higher visuomotor corrections engage primarily the primary motor cortex. Importantly, we show that high confidence specifically recruits the ventral striatum bilaterally (p<0.05 corrected for multiple comparisons), suggesting a role for confidence in motivating action.

Discussion: Taken together, these results show for the first time in healthy controls that confidence for visuomotor action strongly engages motivational regions in line with a key role of metacognition in goal directed behavior and accurate insight into self-performed actions. These results in healthy controls are currently being tested in a cohort of schizophrenia patients and our hypothesis is that patients with higher level of apathy will display lower metacognitive confidence and lower ventral striatum activity.