Objective: Learning about potential rewards and neural representation of reward information are crucial for motivated behaviour and successful environmental interaction. Alterations in neuro-circuits mediating such reward processing and cognitive functions may therefore contribute to the formation of negative symptoms in schizophrenia patients.
Methods: Neuroimaging findings probing reward learning and more general cognitive processing in schizophrenia patients are reviewed with regard to their association with negative symptoms.
Results: While schizophrenia patients display abnormal neuronal activation during reward processing and reinforcement learning in striatal and cortical areas, the reported associations of those alterations with psychopathology are heterogeneous. For example reduced ventral striatal activation during reward anticipation was found to be related to overall as well as subtypes of both negative and positive symptoms. Recently, computational reinforcement learning modelling is applied to describe different aspects of patient's behavior and task solving strategy.
Conclusion: A dysregulation of the brain reward system may contribute to different aspects of psychopathology in schizophrenia. Heterogeneity in sample characteristics, clinical symptom assessment and task design may partially account for inhomogeneous findings. Reinforcement learning modelling provides a powerful tool to disentangle different aspects of reward learning processing in schizophrenia patients. In combination with careful, longitudinal clinical characterization those techniques may help to deepen our understanding how reward system alterations contribute to different aspects of negative symptoms.
Policy of full disclosure: None.

S-03 What happens in adolescence? Developmental aspects in developing psychosis

S-03-001
Impact of age on the prevalence and clinical significance of risk symptoms in 8- to 40-year-olds of the general population

F. Schultze-Lutter (University of Bern, Child & Adolescent Psychiatry, Bern, Switzerland; C. Michel, B. G. Schimmelmann)

Objective: Early detection of psychosis is an important topic in psychiatry. Yet, there is limited information on the prevalence and clinical significance of risk symptoms in children and adolescents as compared to adults. Within two projects funded by the Swiss National Foundation (SNF), we examined ultra-high-risk (UHR) and basic (BS) symptoms and criteria in 8–40-year-olds from the community.
Methods: Risk symptoms were assessed with the Structured Interview for Psychosis-Risk Syndromes and the Schizophrenia Proneness Instruments by well-trained psychologists. Logistic regression analyses were used to assess impact of age on risk symptoms and their clinical significance (current functioning deficits or non-psychotic axis-I disorder), thereby differentiating between perceptive and non-perceptive/cognitive phenomena.
Results: ltogether, 9.9 % of interviewees (N = 689) reported attenuated (APS), none transient psychotic symptoms, and 18.1 % BS; 1.3 % met APS, 3.3 % COPER and 1.2 % COGDIS criteria. For APS, a strong age effect was detected around age 16: compared to 16–40, 8–15-year-olds reported more perceptive APS. Perceptive APS were generally little related to functional impairment, regardless of age. Conversely, non-perceptive APS were related to low functioning, although this relationship was weaker in those below age 16. The age effect detected for BS occurred some good 4 years later: compared to 20–24, 8–19-year-olds reported BS more frequently, in particular cognitive BS. BS in general and especially cognitive BS—while not generally associated with functional deficits—revealed significant interactions with age that impacted on functioning but not psychiatric morbidity, this impact increased with age.
Conclusion: These findings strongly suggest differential developmental factors affecting prevalence and clinical significance of UHR and BS criteria. Further, they emphasize the need to address the differential effects of perceptive and non-perceptive risk phenomena, and their interaction with age, also in terms of conversion to psychosis, in future studies.
Policy of full disclosure: None.

S-03-002
Adolescent brain development and the onset of psychosis

S. Wood (University of Birmingham, Birmingham, United Kingdom)

Objective: Adolescence is a formative period of human development, characterized by increases in affective reactivity, greater interest in and sensitivity towards peer-relationships, and an enhanced capacity to engage in behaviour directed towards long term goals. The developmental changes through this period promote the skills necessary for greater independence and enhance new forms of peer attachment, but they also create greater vulnerability to emotional and behavioural dysregulation. Indeed, the peak age of onset for psychotic illnesses is between 15 and 25, roughly equating to late adolescence.
Methods: Epidemiological, cognitive, and brain imaging studies will be reviewed that demonstrate the importance of the adolescent developmental period for psychosis onset.
Results: There is significant evidence that adolescent onset is associated with premorbid social impairments, longer duration of untreated psychosis, a more severe clinical course, more severe premorbid neurodevelopmental abnormalities, greater genetic loading and more severe negative symptoms. Furthermore, higher cognitive functions fail to show age appropriate gains during adolescence in those who later develop psychosis, while brain imaging data indicates faster maturation of grey matter regions.
Conclusion: Understanding the link between adolescence and the onset of psychosis, including the relationship with abnormal developmental trajectories of functional and structural brain networks, will assist in the search for biomarkers for the development of such illnesses.
Policy of full disclosure: Work relevant to the presentation has been supported by the NHMRC Australia, MRC UK, and NARSAD.

S-03-003
Development of neural oscillations during adolescence: relevance of the development and early detection of psychosis?

P. Uhlhaas (University of Glasgow, Institute of Neuroscience and Psychology, Glasgow, United Kingdom)

Objective: Developmental psychology and brain research have focussed mainly on the early pre- and post-natal periods as critical windows for the organization and functional adjustment of neural circuitry. However, more recent evidence suggest that brain development and its susceptibility to epigenetic influences extends way beyond early postnatal stages. The putative relevance of these changes is highlighted by the fact that the onset of schizophrenia often occurs during the transition from adolescence to adulthood, indicating a vulnerable period during brain development.
Methods: We obtained EEG, MEG- and fMRI-data in two cohorts of participants between 6 and 24 years. In the first study, development of