Complex, culturally specific social relations are crucial for human survival. Interactions between two individuals are strongly influenced by each person’s developmental history, personality, perceptual stereotypes, and social scenarios (Bao & Poeppel, 2012; Klin et al, 2003). In the recent years there has been a growing interest in research on the neural correlates of social cognition, defined as the ability to construct representations of the relations between one and others and to use these representations flexibly to guide social behavior (Wood et al, 2003). A variety of methods were implemented in order to study social cognition. Usually the participants are exposed to verbal/non-verbal tasks that implement static and dynamic images of social interactions in photographs/cartoons/videos/stories. These tasks describe/illustrate scenes of interacting people and are used to examine participant’s interpretation of social situation, including identification of the facial expression, intentions of the characters, attributions of their mental states, mainly focusing on the third person perspective (for review see Frith & Frith, 2012). Despite astonishing progress in the neuroscientific research of social cognition, little attention has been paid to the effect of personal involvement during social interactions. Yet, it is one issue to be personally addressed by another person intending to communicate with us, but quite another issue to passively observe another person intending to communicate with someone else (Grice et al, 1975). This is also differentiated as online and off-line “theory of mind” (Frith and Frith, 2003). Recently neuroimaging studies have begun to target on the online interactions that require personal involvement (Kampe et al, 2003). However, so far the differential effects of personal involvement on the neural underpinnings of social interactions have not been studies systematically.

In online interactions the important aspect is a mutual eye gaze that connects people together and invites joint social attention as well as provides the information about interests and intentions of the interacting person. It is known that the direct gaze captures the attention of perceiver and this attentional capture increases the efficiency of cognitive operations (Baron-Cohen, 1995). Facial expressions are another important nonverbal cue with an impact on person perception, e.g. a smile leads to more positive evaluations than neutral expression (Otta et al. 1994), whereas crying person is judged to be less aggressive and evokes stronger feelings of sadness in the observer (Hendriks & Vingerhoets 2006). Such processing of nonverbal cues is held to occur mostly automatically and intuitively in healthy subjects (Lakin 2006). There is an ample evidence that emotional faces show stronger brain activation when they were presented dynamically rather than static images (LaBar et al, 2003; Sato et al, 2004). At the same time, emotions are important in shaping behavioral patterns by attributing personal significances and social meanings to objects and events, although perception and expression of social emotions might differ culturally. In addition to the universal basic emotions, “social emotions” such as pride, envy, and regret modulate and drive the interaction.

The ability to initiate and maintain communication requires the presence of so-called “social scenarios”: it can be assumed that such stereotyped patterns of behavior for social situations are stored in episodic memory (Mano et al, 2011). Social scenarios are a necessary part of social skills or techniques for maintaining good relations with others, play a major role in social relationships, particularly in communication and collaboration (Vygotsky. 1978). Recent functional neuroimaging studies have reported that the medial prefrontal cortex (mPFC) is involved when encoding high-frequency social scripts used in daily life (Krueger et al., 2009; Mano et al, 2011). In addition, some neuroimaging studies on the role of social context in social interaction, which are not specific to episodic memory, have suggested that the mPFC is recruited during other social cognitive processes that facilitate social context, such as communicative speech production (Sassa et al., 2007). In social interactions intentions (Bara et al, 2004) are also playing an essential not only in initiating of the interaction with another person but also in maintaining this interaction. To date, neuroimaging studies have not properly distinguished between intentions of persons involved in social interactions and intentions of an isolated person. In fMRI study using offline interactions based on the stories evaluation, Walter et al (2004) demonstrated that the anterior PCC is involved in the understanding of the intentions of people involved in social interaction.

Schizophrenia patients experience problems related to socializing with others. Social deficits may be the byproducts of other symptoms of schizophrenia, or they may be a separate schizophrenia symptom, not yet fully understood. Poor social competence in social interaction, in turn, has been found to be uniquely associated with impaired social cognition in patients with schizophrenia. Specifically, Brüne et al (2007) demonstrated in patients with schizophrenia an impaired ability to appreciate the mental states of others (“theory of mind”), predicted poor social skills in patients better than non-social cognition such as executive functioning or...
intelligence. At the same time, Cutting and Murphy (1990) found patients with schizophrenia impaired in their ability to appropriately react in hypothetical social scenarios.

Given the fundamental importance of interpersonal interaction on human development and behavior, we argue that related brain mechanisms should be studied during natural social interaction rather than monitoring snapshots of brain activity from individuals providing them artificial cues. Besides elucidating brain mechanisms underlying the processing of realistic personalized stimuli in every-day life natural set-ups, brain imaging might give an insight into schizophrenia, specifically into the emotional perception and modulation, attributional biases, intentions in online social interactions. The first experiment will investigate the neural correlates of social interactions derived from individual autobiographical experiences with distinct emotional connotations. The second experiment will examine possible neural mechanisms of instant interactions with a virtual person exhibiting dynamic facial expression that resembles real life approach situation when initiating social interactions.

References:


