

28.3 MINIMAL SELF IN SCHIZOPHRENIA: THE TIME PERSPECTIVE

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Background: The feeling of being one continuous individual in time is a natural evidence, which seems to be lost for patients with schizophrenia who display ‘minimal’ or ‘bodily’ self disorders. The continuity in time is a property of the ‘minimal’ self and its alteration could disrupt the sense of self. It has long been proposed that patients with schizophrenia experience a breakdown of the experience of time continuity. This proposal relies on the patients’ self-reports and the phenomenological analysis of their verbal descriptions. We will discuss to which extent recent experimental evidence supports this proposal and provides insight on the mechanisms underlying the perturbation of the experience of time continuity

Methods: We used two original experimental approaches to test the link between the sense of self and time disorders in stabilized patients with schizophrenia and controls. The first relies on the parallel measure of time expectation and minimal self disorders, as evaluated with the EASE (phenomenological scale). Time expectation is indexed by the ability to benefit from the passage of time to react to a visual target: expectation increases with time, leading to shorter reaction times. The second approach consists in asking subjects to evaluate their feeling of control when tapping with a stylus on a virtual surface. The feeling of control is a component of agency, i.e. related to the bodily self. It can be altered even when subjects know the action to be their own, and may thus show alterations in the absence of delusions. In order to test the link between the feeling of control and timing, the haptic feedback (tactile and kinesthetic) was manipulated, with perceptible or imperceptible delays.

Results: Both tasks show that patients can expect sensory signals and react to unusual events to some extent: they increase their reaction times after trials with missing targets, and their feeling of control decreases when sensory feedbacks are delayed. However, the patients who feel as not being immersed in the world (EASE) do not benefit from the passage of time, consistent with previous results suggesting that patients have a difficulty to fluently follow the events flow. In the motor task, contrary to controls the patients’ feeling of control drops as soon as there is an imperceptible delay in the haptic feedback, and patients have difficulty to adjust sensory anticipation in case of delayed haptic feedback

Discussion: The results suggest a link between timing and minimal self disorders. The patients are able to expect well-learned sensory signals. However, the patients with minimal self disorders (altered immersion in the world) display time disorders consistent with a breakdown of time continuity. All patients display disrupted time expectation when events become unusual or uncertain. Expecting events in time helps to link events with one another and thus participates to transform a chain of discontinuous events in a continuous flow. Conversely, fragile time expectations may lead to a sense of discontinuity, which could disrupt perceptions and especially the flow of bodily signals, thus contributing to bodily self disorders.

28.4 FLEXIBLE BODY BOUNDARY AND ALTERED MAPPING OF THE BODILY SELF IN THE SCHIZOPHRENIA SPECTRUM: CAUSES, PROCESSES AND POTENTIAL INTERVENTION

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Background: Our sense of embodied self depends on continuous spatio-temporal integration and predictive coding of multisensory signals to yield a stable internal landscape. However, schizophrenia is characterized by inconsistent mapping of the physical and parasomatic body space, auto-scopic hallucinations and flexible body self boundary. We aimed to elucidate the specific roles of exteroceptive, proprioceptive and interoceptive systems in generating self disturbances. Lastly, if schizophrenia represents one end of the spectrum of bodily self disorders, it is also important to understand what lies at the other extreme end, represented by those whose prediction coding is honed to perfection from years of training (athletes) to gain insight into potential remediation strategies.

Methods: In Study 1, components of bodily self-disturbances were examined in individuals with schizophrenia (SZ), matched controls (CO) and prodromal participants (P) with tasks that assessed tactile perception (2-point discrimination task), susceptibility to proprioceptive-tactile illusions, multisensory integration, visual body mapping of emotions (emBODY), and interoceptive awareness (heartbeat detection task). Phenomenological dissociative experiences were captured with a novel picture-based inventory (BODI). In Study 2, we recruited healthy participants with extraordinary expertise to coordinate interoceptive, proprioceptive and exteroceptive signals to perform physical tasks (athletes), and compared their embodiment of emotions with that of matched controls and individuals with schizophrenia.

Results: Individuals with schizophrenia and prodromal participants were impaired in interoceptive awareness, exteroceptive tactile discrimination, and audio-visual integration compared with matched control groups. SZ and P also showed increased sensitivity to proprioceptive illusions, which was associated with increased dissociative experiences and positive syndromes. Bodily sensations associated with emotions were reduced in SZ and P compared to CO. Importantly, the spatial locations of embodied emotions were different in SZ compared with CO. Interestingly, athletes showed highly precise localization of embodied emotions compared with matched controls. Self-disturbances were exacerbated by social isolation regardless of diagnosis.

Discussion: These results suggest that mapping of internal signals to the experience of external world is inconsistent or incoherent, contributing to fragmented and discontinuous self experience in persons with schizophrenia. More specifically, proprioceptive prediction errors seem to contribute to abnormally flexible self boundary. Diminished access to interoceptive signals may lead to reduced mapping of bodily sensations. Embodied emotions were reduced in SZ and P compared to CO. Athletes seemed to have much more precisely tuned awareness of embodied emotions. These results are consistent with the framework of increased internal neural noise in schizophrenia, which could lead to both weakened and poorly integrated interoceptive, proprioceptive and exteroceptive signaling, and a fragmented sense of self. Athletes data suggest that it may be possible to remediate bodily self disturbances via physical training. These findings underscore the importance of bringing back the body to psychiatry.

Plenary

29. THE COMPLEX INTERACTIONS BETWEEN MIND AND BODY: IT TAKES A BRAIN TO CONTROL IMMUNITY

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Overall Abstract: Thoughts and emotions can impact physiology. This connection is evident by the emergence of disease following stress or recovery in response to placebo treatment. Nevertheless, this fundamental aspect of physiology remains largely unexplored. We have recently shown that activation of the brain’s reward system, which is active in positive emotional states and positive expectations, boosts immunity. In this talk, I will discuss how brain activity can regulate anti-bacterial and anti-tumor immunity and