Mirror self-face perception in individuals with schizophrenia: Feelings of strangeness associated with one's own image

Catherine Bortolon\textsuperscript{a,b,⁎}, Delphine Capdevielle\textsuperscript{b,c}, Rosalie Altmann\textsuperscript{a,b}, Alexandra Macgregor\textsuperscript{b}, Jérôme Attal\textsuperscript{b}, Stéphane Raffard\textsuperscript{a,b}

\textsuperscript{a} Epsylon Laboratory, EA 4556, University Montpellier 3, Montpellier, France
\textsuperscript{b} University Department of Adult Psychiatry, CHU Montpellier, Montpellier, France
\textsuperscript{c} French National Institute of Health and Medical Research (INSERM), U1061Pathologies of the Nervous System: Epidemiological and Clinical Research, Montpellier, France

\textbf{A R T I C L E I N F O}

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\textbf{A B S T R A C T}

Self-face recognition is crucial for sense of identity and for maintaining a coherent sense of self. Most of our daily life experiences with the image of our own face happen when we look at ourselves in the mirror. However, to date, mirror self-perception in schizophrenia has received little attention despite evidence that face recognition deficits and self abnormalities have been described in schizophrenia. Thus, this study aims to investigate mirror self-face perception in schizophrenia patients and its correlation with clinical symptoms. Twenty-four schizophrenia patients and twenty-five healthy controls were explicitly requested to describe their image in detail during 2 min whilst looking at themselves in a mirror. Then, they were asked to report whether they experienced any self-face recognition difficulties. Results showed that schizophrenia patients reported more feelings of strangeness towards their face compared to healthy controls (U = 209.5, p = 0.048, r = 0.28), but no statistically significant differences were found regarding misidentification (p = 0.111) and failures in recognition (p = 0.081). Symptoms such as hallucinations, somatic concerns and depression were also associated with self-face perception abnormalities (all p-values > 0.05). Feelings of strangeness toward one's own face in schizophrenia might be part of a familiar face perception deficit or a more global self-disturbance, which is characterized by a loss of self-other boundaries and has been associated with abnormal body experiences and first rank symptoms. Regarding this last hypothesis, multisensorial integration might have an impact on the way patients perceive themselves since it has an important role in mirror self-perception.

\section{1. Introduction}

One’s face detains a special meaning to humans due to its uniqueness and its importance for our sense of self, self-esteem and identity (Nguyen et al., 2016). Looking at ourselves in the mirror gives us access to our own image, besides the proprioceptive, tactile and motor sensory cues that are also necessary for the representation of one’s own face (Tsakiris, 2008).

Although during mirror self-recognition both explicit (e.g. visual) and implicit (e.g. proprioceptive) information are integrated to allow recognition, we were not born with this ability. In fact, the ability to recognize our own image relies on the development of our basic sense of body and the successful integration of multisensory signals (Sui et al., 2009). For instance, newborns are capable of distinguishing between other and self tactile stimulations from birth (Hespos and Rochat, 1997), but the ability to recognize their own image in the mirror emerges later (14–18 months; (Amsterdam, 1972)).

Recognizing oneself in the mirror is suggested by some authors to implicate the ability to become the object of one’s own attention and to perceive one’s body’s unity (Gallup, 1977). Thus, mirror self-recognition has often been used to explore the association between self-recognition and self-consciousness. However, in most cases, researchers used photographs of individuals’ faces to explore self-face recognition. Nevertheless, mirror and image self-processing cannot be considered as equivalent measures. Studies have found that mirror self-recognition emerges prior to photo self-recognition (Caudron et al., 2004). Furthermore, different neural responses have been found when comparing mirror and photo self-processing (Butler et al., 2012). Finally, preserved self-face recognition on photographs, despite incapacity of self-face recognition in mirrors, has been described in some neurological patients (Breen et al., 2000).

Schizophrenia disorder has been recognized since its earliest
descriptions as a fundamentally self-disorder. For instance, Bleuler (1950) described schizophrenia as being characterized by a “splitting of the self and loss of the feeling of activity or the ability to direct thoughts” (page 143). More recently, schizophrenia patients have been shown to suffer from a disturbance of the most basic sense of self, namely, Minimal Self, characterized by a reduced sense of existing as a subject of awareness for movement and the sense of agency, both of which has been shown to be impaired in schizophrenia disorder (Graham et al., 2014; Waters and Badcock, 2010). Moreover, anomalous self-experiences have been suggested to impact on depression in first episode schizophrenia patients (Haug et al., 2016). Therefore, we hypothesized that significant correlations would be found among these variables.

2. Method

2.1. Participants

A total of 49 adults participated, including 24 patients with schizophrenia and 25 healthy controls. Individuals meeting DSM-IV criteria for schizophrenia, currently receiving inpatient or outpatient care were recruited in the Montpellier University Psychiatric Hospital. None of the patients suffered from acute symptom exacerbations at the moment of the inclusion. Except for one patient, all were under antipsychotic medication. Exclusion criteria were: substance abuse, comorbid neurological disorder, history of severe brain trauma or current electro-convulsive therapy. Diagnoses were made by fully-trained psychiatrists using the structured clinical interview for DSM–IV (SCID).

The healthy subjects were recruited in the Montpellier area either by flyers or via participants and staff working at the hospital. They were screened for current psychiatric illness using the Mini-International Neuropsychiatric Interview (Sheehan et al., 1998). Controls were excluded if they met criteria for any current axis I disorder of the DSM-IV-TR or if they were first-degree relatives of subjects with schizophrenia. Healthy subjects were matched with schizophrenia patients in terms of age, gender and education.

All participants needed to speak, read and write French fluently and received a 40-Euro compensation for participation in the study. Moreover, all participants provided written informed consent, prior to the experiment, approved by the National Ethics Committee (CPP Sud Méditerranée III, Nîmes, France, # 2015.09.04ter and ID-RCB-2015-A01185-44) conforming to the Declaration of Helsinki.

2.2. Instruments and tasks

2.2.1. Mirror self-face task

Participants were sitting in a well-lit room at a distance of 60 cm from the mirror (Fig. 1). Thus, participants’ face was reflected in the mirror and clearly visible. Participants were explicitly requested to describe their image in detail during 2 min. After the task, they answered three questions exploring difficulties individuals might experience when looking at the mirror: 1) When looking at myself in the mirror, I had the impression it was someone else’s face (Misidentification); 2) When looking at myself in the mirror, I could not recognize my face.
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