Psychiatry Research 253 (2017) 205–210

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

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

Catherine Bortolon[a,b,*], Delphine Capdevielle[b,c], Rosalie Altman[a,b], Alexandra Macgregor[b], Jérôme Attal[b], Stéphane Raffard[a,b]

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

ARTICLE INFO

Keywords:
Self-face
Schizophrenia
Self-mirror perception

ABSTRACT

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.

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 (Courage 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

* Corresponding author at: Epsylon Laboratory, EA 4556, University Montpellier 3, Montpellier, France.
E-mail address: catherine.bortolon@gmail.com (C. Bortolon).

http://dx.doi.org/10.1016/j.psychres.2017.03.055
Received 5 September 2016; Received in revised form 26 February 2017; Accepted 17 March 2017
Available online 03 April 2017
0165-1781/

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, in the first person perspective or as an agent of action (Nelson et al., 2014; Sass, 2014). Likewise, Stanghellini (2009) suggested that the Minimal Self also implicates the differentiation between self and other and a sense of one's own body, which includes the sense of ownership for movement and the sense of agency, both of each has been shown to be impaired in schizophrenia disorder (Graham et al., 2014; Waters et al., 2012).

Concerning self-face recognition (SFR), like most of the research performed in healthy individuals, SFR has been explored in schizophrenia with photographs, leading to mixed results (Heinisch et al., 2013; Irani et al., 2006; Jia et al., 2013; Kircher et al., 2007). Whereas first studies indicated that schizophrenia patients have abnormal performance on SFR tasks (Kircher et al., 2007), two recent studies revealed that SFR appears to be preserved in schizophrenia patients (Bortolon et al., 2015a, 2016). However, less is known about mirror self-face recognition in schizophrenia. Two studies so far have investigated mirror self-faceperception (SFP) in schizophrenia disorder and in schizotypy. First, Caputo et al. (2012) found that patients with schizophrenia report more frequent and more intense apparitions of strange-faces in the mirror compared to healthy controls. In this study, participants were requested to look at their face in the mirror for 7 min in a room with reduced lighting in order to experimentally induce apparitional experiences (Mirror-Gazing test – MGT). Subsequently, Fonseca-Pedrero et al. (2015) implemented a similar experimental task in a nonclinical sample of adolescents. They found significant correlations between disorganization dimension of schizotypy and illusions during the MGT. Although these results can help us to understand mirror self-recognition, they used an experimental task whose aim was to create the apparitions of strange-faces in the mirror. Therefore, it might not be representative of patients' daily experiences.

Daily difficulties in processing one's own face have been reported in healthy individuals when looking at one's own image in the mirror such as having the impression that their face looks weird or different somehow (Bredart and Young, 2004; Laroi et al., 2007). Although schizophrenia disorder is characterized by self-abnormalities (Graham et al., 2014; Waters et al., 2012) as well as abnormal body dysmorphic experiences (Stanghellini, 2009), schizophrenia patients seem to experience similar amounts of daily life SFP difficulties as healthy controls (Bortolon et al., 2015a). Nevertheless, patients also report looking at their own image less often, which may explain why they report less daily life SFP difficulties than expected. One way to overcome this issue is to request participants to look at themselves in the mirror and assess the perception associated with their own face/image.

Thus, this study's first aim was to investigate the physical self in schizophrenia patients, which implicates self-face recognition (Sugiura, 2013, 2015). More specifically, our goal is to explore mirror self-face perception difficulties in schizophrenia. Based on previous studies (Caputo et al., 2012; Fonseca-Pedrero et al., 2015), we hypothesized that schizophrenia patients would experience more SFP difficulties when looking at their image than healthy controls. Secondly, we aimed to investigate the association between mirror SFP difficulties and clinical symptoms in schizophrenia disorder. More specifically, we were interested in the relationship between SFP difficulties and auditory hallucinations, somatic concerns and depression symptoms. Aforementioned, dysmorphic experiences and abnormal body experiences have been previously described in schizophrenia disorder (Stanghellini et al., 2012) as well as a abnormalities in body image and schema, which seems to be especially characteristic of patients experiencing first-rank symptoms including auditory hallucinations (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 Méditérannée 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 reflect 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 – Not at all; 2 – A little bit; 3 – A lot; 4 – Totally) based on the questionnaire developed by Laroi et al. (2007):

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

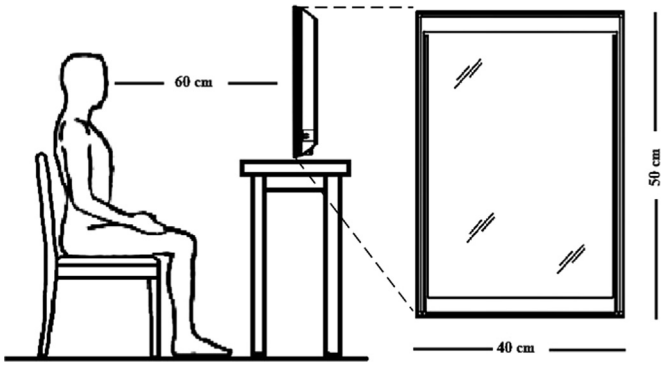

Fig. 1. Experimental set-up for the mirror self-face task.