



Denial of illness in schizophrenia as a disturbance of self-reflection, self-perception and insight



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ABSTRACT

Background: A substantial proportion of schizophrenia patients deny aspects of their illness to others, which may indicate a deeper disturbance of 'insight' and a self-reflection deficit. The present study used a 'levels-of-processing' mnemonic paradigm to examine whether such patients engage in particularly brief and shallow self-reflection during mental illness-related self-evaluation.

Methods: 26 schizophrenia patients with either an overall acceptance or denial of their illness and 25 healthy controls made timed decisions about the self-descriptiveness, other-person-descriptiveness and phonological properties of mental illness traits, negative traits and positive traits, before completing surprise tests of retrieval for these traits.

Results: The acceptance patients and denial patients were particularly slow in their mental illness-related self-evaluation, indicating that they both found this exercise particularly difficult. Both patient groups displayed intact recognition but particularly reduced recall for self-evaluated traits in general, possibly indicating poor organisational processing during self-reflection. Lower recall for self-evaluated mental illness traits significantly correlated with higher denial of illness and higher illness-severity. Whilst explicit and implicit measures of self-perception corresponded in the healthy controls (who displayed an intact positive > negative 'self-positivity bias') and acceptance patients (who displayed a reduced self-positivity bias), the denial patients' self-positivity bias was explicitly intact but implicitly reduced.

Conclusions: Schizophrenia patients, regardless of their illness-attitudes, have a particular deficit in recalling new self-related information that worsens with increasing denial of illness. This deficit may contribute towards rigid self-perception and disturbed self-awareness and insight in patients with denial of illness.

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1. Introduction

1.1. Self-awareness and self-evaluation in schizophrenia

A disturbance of self-awareness has long been viewed as a core deficit of schizophrenia. For example, it has been argued that an over-awareness of one's normally subconscious perceptions and thoughts forms the basis of hallucinations, delusions and incoherent speech (Frith, 1979), and that an under-awareness of one's intentions to move, think and imagine can result in delusions of control, delusions of thought insertion and hallucinations, respectively (Frith, 1992). Yet these disturbances of self-awareness do not fully account for the formation of such psychotic symptoms. Along with the *experience* of failing to feel control for self-initiated activity, and its resulting *attribution* to an external agent, there must arguably be the concurrent *evaluation* that such erroneous perceptions and beliefs are veridical, and not the result of abnormal self-functioning (Bedford, 2010). Thus, a problem of self-evaluation during the experience of psychotic symptoms

represents an important way in which self-awareness can be disturbed in schizophrenia.

1.2. Self-evaluation, denial of illness and insight in schizophrenia

When patients evaluate themselves during a clinical interview, most do appear to at least partially accept that their psychotic episodes indicate abnormal self-functioning, stem from having a mental illness, and require treatment, although a substantial proportion do not. For example, of the 221 schizophrenia patients studied by Amador et al. (1994), 40% and 58% completely rejected having their hallucinations and delusions, respectively, 32% completely rejected having a mental illness, and 22% completely rejected the efficacy of their medication. Such rejection of illness-related aspects is clinically referred to as 'poor insight' (David, 1990) or 'unawareness of illness' (Amador et al., 1991), and may indicate the presence of disturbed self-awareness and a self-reflection deficit.¹ Alternatively, such a patient may have intact self-reflection and good *privately-held* self-awareness of illness, yet a conscious motivation

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¹ The term 'self-reflection' will be used to refer to a theoretical cognitive mechanism of self-directed thinking that underlies self-evaluative decision-making.

to withhold this awareness from others (e.g., because of a need to avoid stigma or hospitalisation). The present study sought to address this issue by examining self-reflection ability in schizophrenia patients with either an overall acceptance or denial of illness. To avoid confusion, the terms 'acceptance' and 'denial' will be used to refer to patients' explicitly-stated attitudes, and 'insight' to refer to their privately-held self-awareness of illness.²

1.3. Neuroimaging studies of self-evaluation in schizophrenia

A handful of studies have examined whether self-reflection is impaired in schizophrenia. Using a functional neuroimaging paradigm, Bedford et al. (2012) found reduced dorsomedial prefrontal cortex (PFC) activity during the self-evaluation (but not other-person-evaluation) of positive and negative personality traits in schizophrenia patients (compared to healthy controls), indicating underuse of a key region of the cortical midline brain network that is normally highly active during self-reflection (Northoff et al., 2006; van der Meer et al., 2010). However, when self-evaluating mental illness traits, both the dorsomedial PFC and dorsolateral PFC (a region normally associated with executive function rather than self-reflection) were *overactive* in the patients, with higher denial of having a mental illness moderately correlating with lower activity in the former region but higher activity in the latter. These findings indicate that, rather than being underused, the self-reflection brain network of schizophrenia patients is under increased effort during mental illness-related self-evaluation, and that the inappropriate use of executive regions during this exercise is related to denial of illness. Whilst other neuroimaging studies have found either reduced or increased cortical midline activity during personality-related self-evaluation in schizophrenia (Holt et al., 2011; Shad et al., 2012; van der Meer et al., 2012), they did not examine illness-related self-evaluation.

1.4. Memory studies of self-evaluation in schizophrenia

The present study used a similar evaluative task to that of Bedford et al. (2012), but with episodic memory performance rather than neural activity as the index of self-reflective processing. The task is based on the 'levels-of-processing' theory that the 'depth' to which stimuli are originally processed can be measured by the extent to which they are subsequently remembered (Craik and Lockhart, 1972), as exemplified by the finding that higher retrieval of words results from deeper (e.g., semantic) processing than shallower (e.g., phonological) processing (Craik and Tulving, 1975). In line with this theory, the finding that self-evaluation results in higher retrieval of trait-adjectives than semantic-evaluation (the 'self-reference effect'; SRE; Rogers et al., 1977) indicates that self-reflection normally involves a particularly deep level of processing, and offers a paradigm for gauging self-reflection depth.

Three previous studies have used this paradigm in schizophrenia. Harvey et al. (2011) found reduced recognition for a mixture of self-evaluated (but not semantically-evaluated or orthographically-evaluated) positive and negative personality traits in schizophrenia outpatients (compared to healthy controls), indicative of particularly shallow self-reflection. However, in a study by Pauly et al. (2011), there appeared to be reductions in the schizophrenia patients' recognition for other-person-evaluated as well as self-evaluated positive and negative personality traits (compared to healthy controls), indicative of shallow person-reflection in general (although the statistical significance of these reductions was not reported). Finally, Clifford and Hemsley (1987) observed an intact SRE and *increased* recall for self-evaluated (but not semantically-evaluated or orthographically-evaluated) positive

and negative personality traits in schizophrenia patients (compared to patients with severe depression), indicative of deep self-reflection in schizophrenia and shallow self-reflection in depression (in line with other studies that also found reduced retrieval for self-evaluated traits in depression, e.g., Derry and Kuiper, 1981; Kuiper and Derry, 1982).

In conclusion, it is unclear whether schizophrenia patients engage in particularly shallow self-reflection (Harvey et al., 2011) or person-reflection (Pauly et al., 2011), and, given that both these studies compared schizophrenia patients with mild depression to healthy controls, it is possible that the patients' shallow self-reflection was due to their depression rather than their schizophrenia.

1.5. Present study's aims

The present study used a similar mnemonic paradigm to examine self-reflection duration and depth in schizophrenia patients with either an overall acceptance or denial of illness and healthy controls. Mental illness traits were employed as well as personality traits in order to examine whether the denial patients might display particular self-reflection problems during mental illness-related self-evaluation. It was predicted that, if denial of illness in schizophrenia is related to particularly (1) brief and (2) shallow self-reflection during mental illness-related self-evaluation, the denial patients would (1) make faster evaluative decisions and (2) have lower recall and recognition for self-evaluated mental illness traits than the comparison groups. Furthermore, it was predicted that there would be correlations in the total patient sample between higher denial of illness and (1) faster evaluative decisions and (2) lower recall and recognition for self-evaluated mental illness traits. Finally, the experimental paradigm offered an opportunity to examine self-perception and the 'self-positivity bias' (the normal tendency to regard oneself as having more positive than negative traits; Mezulis et al., 2004) in each group, both at an explicitly-stated level (encoding performance) and at an arguably implicit level (retrieval performance).

2. Methods

2.1. Participants

Schizophrenia patients were recruited from the South London & Maudsley NHS Foundation Trust (SLAM) and were eligible if they were aged between 18 and 65 years, were proficient speakers and readers of English, were aware of the current British Prime Minister (Tony Blair), and had a diagnosis of schizophrenia with hallucinations and delusions (DSM-IV-TR criteria; American Psychiatric Association, 2000), a stable dose of antipsychotic medication and no other major medical condition. Using a modified version of the expanded Schedule for the Assessment of Insight (a clinical interview for rating illness-related attitudes; SAI-E; Kemp and David, 1997),³ 26 patients were divided into two groups: 14 who displayed an overall acceptance of their illness (SAI-E total score ranging from 15 to 28) and 12 who displayed an overall denial of their illness (SAI-E total score ranging from 3 to 9). 25 healthy controls with similar demographic characteristics to the patients were recruited according to the same inclusion criteria, but with the exceptions that they did not have a major medical condition and that they did not score highly (i.e., more than 21 out of 37) on the Schizotypal Personality Scale (STA; Mason et al., 1995). All participants gave their informed consent to take part and were remunerated for their assistance. The study was approved by the SLAM research ethics committee (NHS Research Ethics

² The term 'denial' will be used in line with its neuropsychological definition as 'the statement that some state of affairs does not exist' (Beaumont et al., 1996), and does not imply that the denier privately accepts what is being explicitly denied.

³ Patients' SAI-E 'treatment-acceptance' scores were measured on the basis of their own (rather than informants') reports for the two items of (1) behavioural acceptance and (2) unprompted request for treatment, in line with the study's focus on patients' own explicitly-stated attitudes towards their illness.

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