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# Self-reflection in illness and health: literal and metaphorical?

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**ABSTRACT** Self-reflection describes a series of processes whereby a person appraises, evaluates or judges themselves. This appraisal can be in terms of physical, psychological or moral attributes. A number of self-reflection tasks have been designed and applied in experimental psychology and clinical settings. What is not known is whether self-reflection is a valid construct for study and whether it has any clinical implications for psychiatric patients deemed to have impaired self-reflection or "insight". One design is to contrast the appraisal of another person with that of the self. Although it would be useful to measure this appraisal against a gold standard, that is not always possible. Similarly there may be doubt about what the person really thinks as opposed to what they may say. Nevertheless, the simple act of self-reflection can be studied using cognitive neuroscience methods. It appears that a certain brain network, the central midline system (CMS), is engaged in this task. People with mental disorders, especially those at the psychotic end of the spectrum, often see themselves differently from how others see them and the term lack of insight may be used to describe this situation. Recent neuroimaging research has shown that those whose self-appraisal accords most with others, especially their doctors', show greater activation in the CMS and may have a better clinical outcome. One potential therapeutic approach with such patients to encourage self-reflection has been to make use of literal self-reflection through photographs and video.

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## Introduction

Self-*detection* if not self-*reflection* is a crucial biological function. Any complex organism has to be able to detect "what is me" and "what is not me"—from an immunological point of view so that the organism can mount a defence against what is not them, and this has to be accurate enough to prevent an inadvertent self-destructive attack. The science of immunology has uncovered the complexity of these functions and clinical medicine is full of examples where it may go awry.

In the cognitive domain recognizing self and non-self is a higher order function (see Kircher and David, 2003). A simple way in which it can be expressed is in terms of mirror recognition, that is, the ability to appreciate the image in the mirror is oneself. This is a task claimed to be accomplished only by higher primates such as chimpanzees, and in humans, only after the age of about 18 months (see Anderson and Gallup, 2015, for a recent critical review).

Taking self-reflection beyond mere recognition brings us to the main topic of this essay, namely self-judgement or appraisal and the ability to see oneself as if through another person's eyes. Specifically I will explore whether:

(i) there is a credible neurological substrate for such judgements; and
(ii) the ability (or lack of ability) for self-reflection has clinical implications and examine empirical studies which have attempted to address the issue. For the latter aim, I will concentrate on the major psychiatric disorder, schizophrenia, about which there has been most written in relation to self-reflection and where a deficit in this process has long been thought to be a core feature. However, other conditions will also be considered briefly. My overriding aim is to act as a bridge between certain empirical, neuroscientific and conceptual thinking on the topic of self-reflection.

Self-appraisal includes the sort of questions one might ask which fall under the headings: "What sort of person am I? What am I like physically? What am I like psychologically? What am I like morally? What are my strengths and weaknesses?" and moving into the domain of health and illness: "How well do I function or perform? How is my health, am I healthy or ill?" Moving into psychiatry, takes us to: "am I physically or mentally unwell, or disturbed or ill?" and if mentally ill, "can I re-label some of my experiences as pathological or because of a mental illness and do I think that they are the sort of phenomena that require a bio-medical treatment or some other form or restitution?" (see David, 1990,1999). The cloud hanging over all the answers to these questions is to what extent the person is able to answer the questions honestly: "what sort of person am I *really*?"

Looking at a wider model of insight and self-awareness and drawing on data from the neuropsychological literature and the neurological condition of anosognosia[1], we have constructed for the first time a detailed chart which bridges awareness of deficit and illness and unawareness of deficit or illness (see Fig. 1). However, awareness of deficit can be expressed explicitly, as in "yes, there is something wrong with me" although this sincerely held view may not be expressed for reasons of self-deception or other tactics. The awareness may however, be unconscious, implicit or tacit in which case it might emerge through behaviours or other mechanisms. Finally, there is the situation of genuine unawareness because of a cognitive- or other awareness-deficit, therefore there may not be a clear distinction between awareness and unawareness, insight and lack of insight, and when the person answers the question "are you ill?" with either a "yes" or more importantly a "no", several other questions remain unanswered.

## Empirical studies

Is it possible to test self-appraisal in an objective, experimental setting? There are a number of self-appraisal paradigms, which are based simply on requiring a participant to respond to a stimulus—which could be a word or a picture—and indicate whether the stimulus applies to themselves (these have been well reviewed elsewhere—see Gillihan and Farah (2005); van der Meer *et al.* (2010); Northoff *et al.*, 2006). Most commonly the paradigm uses trait adjectives and these can be divided into whether they are positive or negative, physical or psychological or on any other dimension. The person's actual response, yes or no, to the words in terms of whether they apply to themselves may be recorded as well as other measures such as their reaction time. A quick reaction time may indicate a lack of conflict over the answer.

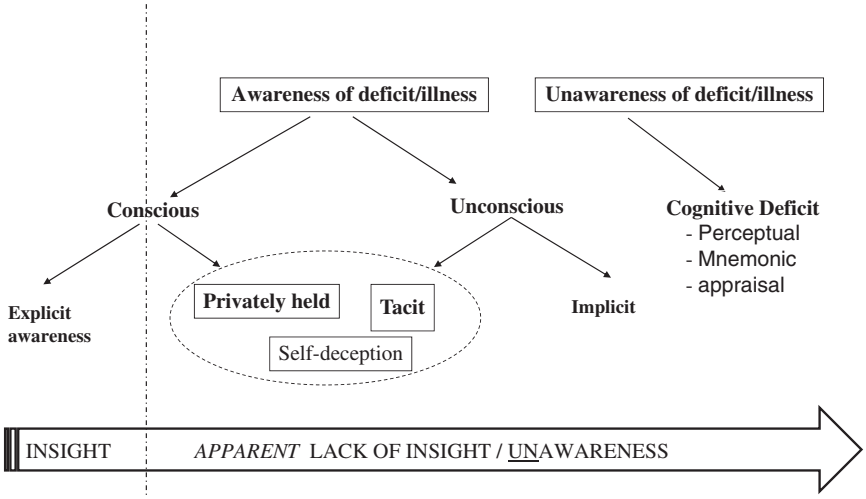


**Figure 1 | The spectrum of insight and self-awareness. As we move from left to right so the degree of awareness decreases. The broken line denotes a partial boundary between unconscious and conscious awareness. All attitudes to the right of this line can be summed up by saying that if a person is asked if there is anything wrong with him he will say "no". However what that tells us about their actual awareness is likely to be more complex.**

Responses might be compared to some putative "gold standard" although this is hard to come by. More commonly the comparison is made between the self-appraisal and the appraisal adjective in relation to another person, either someone close to the individual or generally known such as a famous person. A further level of control can be to require the participant to process the word at an orthographic or low level criterion such as whether the word contains a particular letter, or if it is in upper or lower case. The experimental paradigm has been well reviewed, particularly in relation to neuroimaging studies (Northoff *et al.*, 2006; van der Meer *et al.*, 2010; see below).

Using this kind of simple, structured experiment can be quite revealing especially when groups are compared—in terms of correctness against a gold standard, or reaction time difference between higher and lower levels of processing. For example a study comparing mental illness related terms and their self-appraisal in healthy subjects and patients with schizophrenia who had been categorised as having good or poor insight, revealed that not all trait adjectives are treated in a predictable way. While overall, mental health related words were less likely to be acceptable to patients with poor insight, certain terms which denoted general un-wellness or distress (for example, "depressed") were acceptable, in fact more accepted in the poor insight group than in the good insight group. On the other hand, more stark terms which had a pejorative implication (for example, "crazy") were particularly rejected by the poor insight group while being owned by other patients and healthy controls (David *et al.*, 2012a). Hence there is evidence of a degree of bias or discrimination being used in self-evaluation which tends to go against a blanket model of unawareness in schizophrenia patients with poor insight.

Comparing self- and other-evaluation can also be revealing even in very simple scenarios. The basis of the comparison is that I have privileged access to my own thoughts and feelings therefore I should be the best person to judge myself (but see Wilson, 2004 in his book *Strangers to Ourselves*). What I report to you is hugely influenced by how I want you to see me, therefore by my own values, and this relates to self and other deception. But if I notice an attribute or quality in someone else, it proves that I understand the nature of this attribute especially if other people notice the same attribute in that same someone else. If I fail then to own this attribute in myself that other people tend to ascribe to me, this can be put down to a failure of my self-reflection assuming of course that I am answering honestly.

Any distinction between self and other evaluation can be easily detected using a vignette method of assessment. In one of the first studies to use this method, McEvoy *et al.* (1993) presented vignettes to psychiatric patients with schizophrenia and their psychiatrists. The vignettes contained the usual features of psychotic disorder. The psychiatrist was asked whether the person in the vignette resembled a particular patient. The patient was then asked whether the description of the person in the vignette could be attributed to someone suffering from a mental illness. And finally the patient was asked whether the person in the vignette was anything like themselves. In answer to the first question the psychiatrist tended to confirm that there was a strong resemblance between the patient in front of them and the vignette. Interestingly the patient tended to agree that the person in the vignette would be deemed to be suffering from a mental illness hence confirming a general understanding of the nature of mental illness and what is constituted by it. However, where the difference in opinion emerged was where the patient was asked if they recognised a resemblance between the person (and their experiences) in the vignette, and themselves—which they emphatically rejected. This strongly suggests that the "lack of insight" which patients with schizophrenia show, is not because of a lack of understanding of the rules by which a person is given a diagnosis of a mental disorder, but rather it is because of an inability or reluctance to apply these rules to themselves. A further more refined test of this was carried out by Benjamin Wiffen *et al.* (2013). He tested judgements of vignettes representing psychosis, in both patients and controls. The hypothesis was: if patients had low explicit insight but preserved implicit insight they would tend to attribute mental illness symptoms to the "other", that is, a vignette expressed in the third person more than themselves, that is, a vignette expressed in the first person.

He carried out a study with 44 first episode psychosis patients plus healthy controls. Four vignettes were composed to briefly represent psychotic experiences. For example:

> John is a 28 year old who believes he is too easily influenced by strong minded people. It is almost impossible to understand what he says as he jumbles many different ideas together. He often criticises himself for the mistakes he makes because he believes everyone knows what he is thinking because his thoughts are broadcast just like television.

In the third person condition participants rated the statements made on three dimensions of insight (David, 1990), namely: this person has something wrong with them like a mental illness; this person needs treatment for what is happening to them; these events and experiences are in this person's mind. Stories and statements are also rephrased in the first person and the question is asked if these events were happening to me, that is, not to "John" in other words, I would think there was something wrong with *me* like a mental illness; and that I would need treatment; and the experiences are in *my* mind.

The results were surprising as they showed that the *healthy controls* were more likely to attribute mental illness to the third person rather than the first person vignettes. Contrary to expectation, patients were even handed. Patients and controls accepted the description of the person in the first person to same extent. Psychosis patients were less likely to attribute mental illness to the third person vignette than to themselves so there was no evidence of self-serving bias as seen in controls.

The self-appraisal paradigm comparing ownership of trait words to self-other and the phonological judgement can also be used to examine the so called self-reference effect. This is based on the levels of processing framework within memory theory. The self-reference effect states that encoded material in relationship to the self, such as "are you such and such" has a mnemonic advantage over the same material encoded in relation to another person or another feature and this is because ofthe organisation of the self-semantic structure (Symons and Johnson, 1997). We used this to test the hypothesis that schizophrenia patients with poor insight would have a reduced self-reference effect versus good insight patients and controls because ofpoor self-reflection when recalling mental illness trait words (Bedford and David, 2014). We found the expected self-reference effect in controls, that is, more words were recalled when they were encoded in relation to self, versus other (in this case Tony Blair) or following phonological encoding (whether the word rhymed with another word). However there was no evidence of a self-reference effect in either of the two patient groups both good and poor insight. Their overall level of recall was comparable with the controls so this was not because of a generally poor memory. So, contrary to the hypothesis there does appear to be a problem with self-reference, which is perhaps because of a less structured self-semantic system and this applies to all patients with schizophrenia irrespective of their level of insight and is probably an enduring trait.

## Cognitive neuroscience

One advantage of the structure and uniformity of the self-reflection or self-appraisal paradigm is that it is now possible to examine brain activity while a person carries out the task. Again, the different objects of appraisal and the different kinds of stimuli used can be exploited in a subtraction paradigm to explore the key areas of the brain, using functional imaging techniques, which underlie the particular cognitive activity. Such work has been carried out in a number of centres and subject to reviews and meta-analyses for example van der Meer *et al.* (2010).

In van der Meer *et al.*'s review, it was found that an area in the medial frontal cortex both superior and mid orbital, and anterior cingulate were the most consistently activated during self-reflection tasks. Less commonly activated were areas in the posterior mid line cortex. The general consensus from this and other reviews (Schmitz and Johnson, 2007) has given rise to the notion of a cortical midline system (CMS) in relation to self-reflection and self-appraisal. Applying such paradigms in clinical groups is a recent development but interestingly a consistent pattern has emerged, namely that a variety of conditions thought to be characterized by poor insight and lack of awareness such as addictions and dementing conditions all show dysfunction in this cortical midline system.

We recently carried out a study on insight and self-evaluation on schizophrenia patients using fMRI in conjunction with the paradigm described earlier (Bedford *et al.*, 2012). Eleven patients with schizophrenia were compared with eight healthy controls. Summarising the results, there were areas of the medial and superior frontal region that were more activated in controls compared to patients overall while carrying out the self-evaluation paradigm. There were also some areas that were more active in the schizophrenia patients outside this region such as the right mid frontal and left temporal lobes. Of particular interest was an interaction which was significant in the left frontal gyrus wherein healthy controls showed a specific increase in activation in the appraisal of self- versus other while the schizophrenia patients showed the same level of activation across self and other conditions. This suggests there is some impairment in self-reflection caused by dysfunction in this brain region. Whether this relates purely to insight or other aspects of the schizophrenia condition is not proven. Similarly whether this functional impairment relates to structural abnormalities in the same or similar brain regions is a topic of ongoing research. Our own work suggests there is some alignment between the structural and functional abnormalities.

It must be acknowledged that this study involved a small number of participants so awaits replication. However a larger study carried out by van der Meer *et al.* (2013) found broadly similar results. Their aim was explicitly to investigate the neural correlates of self-reflective processing and in turn, their relationship with insight in schizophrenia. They recruited 47 schizophrenia patients and 21 healthy controls. The task was the usual verbal self-reflection paradigm. Higher insight scores were associated with greater brain activation in inferior frontal and parietal regions. Furthermore a measure of an individual's propensity to self-reflect and question their beliefs and perceptions (so-called "Cognitive Insight" Beck *et al.*, 2004) was correlated with activation in ventromedial prefrontal cortex, that is, the CMS. Cognitive Insight itself is emerging as a predictor of clinical outcome in psychosis (O'Connor *et al.*, 2017).

## Clinical applications

**Psychosis**. One can ask whether the foregoing observations can be put to any therapeutic use with patients with psychosis. The study of self-reflection and insight in clinical settings naturally leans towards discussions on adherence to treatment and the formation of a therapeutic alliance between patient and doctor. While "good insight" and adherence go together the attempt to actually foster self-reflection with the aim of improving treatment outcomes more broadly would seem to have only recently been attempted using non-interpretative psychotherapeutic techniques (Hillis *et al.*, 2015). In fact, this idea goes back to the mid-nineteenth century and the psychiatrist Diamond (1976) working in Springfield hospital, South London. He wrote a book entitled *On the application of photography to the physiognomic phenomena and insanity* (1856). He studied the effects of self-observation on insight in psychotic patients. One illustrative case was a lady known as Ann Dimes who was 20 years old when admitted to Springfield hospital in 1854 having left the Bethlem Hospital after one year apparently "uncured". She suffered from grandiose delusions, believing she was The Queen. Doctor Diamond took her photograph giving slightly spurious grounds:

> I told her that it was my wish to take portraits of all the queens under my care, the patient was non-plussed;
> Queens indeed! How did they obtain their titles? They imagined them.

He goes on to describe her later reaction to seeing her own photograph.

> Her subsequent amusement in seeing the portraits and frequent conversation about them was the first decided step in her improvement and about four months ago she was discharged perfectly cured and laughed heartily at her former imaginations.

A more modern version of this has been attempted by Davidoff and colleagues (Davidoff *et al.*, 1998) in Boston. They used video recordings of patients recently admitted with psychosis. They compared the effect of patients watching videos of themselves with that of a control video—of the comedy pianist Victor Borge. They found that the experimental condition later led to greater insight compared to those shown the control video in a comparison of nine versus nine patients using the Insight and Treatment Attitudes Questionnaire (ITAQ) as the outcome measure. The question that arises from this study is whether seeing *anyone* in a psychotic state and appreciating that it was abnormal was the critical factor to having a positive therapeutic benefit or whether it was specifically seeing *oneself* when psychotic.

We therefore carried out a new study on 40 patients assessed on admission with baseline psychopathology and insight scores (David *et al.*, 2012b). Consent was taken to record a video interview shortly after admission. A few days after initial treatment, participants were randomized to viewing the self-video or another video, a pre-recording of an actor of the same gender displaying the same kinds of psychotic symptoms. Insight and other scores were measured blind to allocation before and 48 hours after the video was presented. The results showed that comparing the initial assessment pre video and post video all patients were (thankfully) on a trajectory of improvement with lowering of symptoms and increasing insight. However, there was no significant difference between watching the self-video and the other video although there was a trend for scores on the Schedule for Assessment of Insight Scale (SAI-Expanded; Sanz *et al.*, 1998) to improve more but not on the ITAQ. We therefore have to conclude there is not necessarily a specific effect of watching oneself on improving insight but perhaps it is a general effect of watching a person in an ill state that causes an individual in a similar ill state to reflect on their own condition. So the nature of

the video may still have an effect through prompted self-reflection although it is hard to see an experiment other than the one presented that could really pin this down.

**Other conditions**. Video self-observation (VSO) has been used as a therapeutic technique in other conditions in ways which shed light on the influence of literal and metaphorical self-reflection. Social anxiety disorder is characterised by an excessive fear of situations involving social interaction or social performance where scrutiny by others is likely. This can range from giving a lecture in front of a large audience to signing a cheque in a bank. One consistent element to the sufferers' experience is that they imagine themselves, rather vividly, "in the act" but in the worst possible light, wherein all their worst fears are played out. Hence they see themselves pouring with sweat, falling over and stammering incomprehensibly and so on. A standard therapeutic approach to this and other anxiety-driven syndromes, cognitive behaviour therapy, involves encouraging the person to confront the feared situation but armed with a method for questioning and hopefully refuting each of their "biases", along with knowledge that "exposure" to the feared situation will lead to habituation to the anxiety. It has been found that video recording and playback of the person enacting the feared "performance" facilitates the process since it provides concrete evidence that the worst fears were not evident to an objective observer (Rapee and Heimberg, 1997). This use of VSO contrasts with the use in psychosis since here it is aimed at showing that the patients' view of themselves is distorted in the direction of pathology while in the former it is the other way round. The effectiveness of VSO in social anxiety may be because of the inherent lack of severity of the condition compared to say, schizophrenia. Alternatively it is possible if not likely that shifting a person's self-awareness towards a view of themselves that is more healthy rather than less so, will encounter less resistance.

Another use of VSO recently reported is in traumatic brain injury (TBI) where impairment in abilities to carry out complex procedures as well as in awareness of such abilities is often compromised. People with TBI often have similar failures to those with psychosis, to appreciate how their behaviour impacts on others and often minimise their disabilities and the effects their brain damage has had on their personality and intellect. A recent well-conducted trial required TBI patients to learn how to prepare a meal while their competence was measured. The study compared three conditions: VSO combined with simple verbal feedback, verbal feedback alone and experiential feedback (Schmidt *et al.*, 2012). The authors found that participants made on average 70.7% fewer mistakes following the condition with VSO versus the other conditions (approximately 20–40% reductions) which they interpret as evidence of improved "online awareness". There was also the suggestion that this group improved in terms of "intellectual awareness" as measured by a questionnaire which contrasts the individual's own rating of their difficulties and abilities with that of their therapist (the larger the discrepancy, the worse their awareness). This work suggests that despite the neurological origins of impaired self-awareness in TBI, there is some scope for it to be compensated. Adaptations of VSO would seem to be worth pursuing as a therapeutic approach in a range of neuropsychiatric conditions.

## Conclusions

We have seen that the topic of self-reflection and self-evaluation is a useful normative construct that can be used with healthy people and those with psychiatric disorders to try and understand processes underlying "insight". Studying self-reflection is hampered by difficulties interpreting self-reports and there is evidence of self-serving bias and presumably self-deception in taking self-report at face value.

Self-reflection involves appraising oneself against all representations of health and illness and against other perspectives. Understanding the mechanisms which underlie this and those which may encourage or discourage such self-reflection may have therapeutic implications.

In terms of cognitive neuroscience there is increasing acceptance that there is a central mid-line cortical system which is associated with self-awareness in the brain. Damage or dysfunction of this area may underlie poor insight in a variety of conditions. Schizophrenia patients who often show poor insight into their condition show objective evidence for abnormal self-processing in the self-reference paradigm and there is now fMRI evidence of altered self-appraisal at the brain functioning level implicating part of the CMS. Finally, it is possible that literal self-reflection (watching oneself in a video or photograph) may directly or indirectly aid psychological self-reflection and can be utilized in the treatment of a number of different disorders.

## Note

1 The term anosognosia is used "to denote a complete or partial lack of awareness of different neurological…and/or cognitive dysfunctions.", from G.P. Prigatano, ed. *The Study of Anosognosia*, Oxford University Press, 2010, p.17.

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