

NORMATIVITY AND RATIONALITY IN DELUSIONAL PSYCHIATRIC DISORDERS*

José Luis Bermúdez

Abstract

Psychiatric treatment and diagnosis rests upon a richer conception of normativity than, for example, cognitive neuropsychology. This paper explores the role that considerations of rationality can play in defining this richer conception of normativity. It distinguishes two types of rationality (procedural and epistemic) and considers how each type can break down in different ways in delusional psychiatric disorders.

Both psychiatry and cognitive neuropsychology study and attempt to treat patients suffering from cognitive disorders. Both disciplines thus depend upon conceptions of normal cognitive functioning. These conceptions are required not simply as goals for eventual therapy and treatment, but also for the purposes of classification. In familiar philosophical terms, both psychiatry and neuropsychology are irreducibly normative disciplines, But each involves a very different type of normativity and, as shall argue in this paper, we cannot understand psychiatric disorders without understanding the distinctiveness of the norms that they contravene. This paper explores the role that norms of rationality play in the distinctive normative dimension of psychiatry.

After distinguishing the different types of normativity implicated in cognitive neuropsychology and psychiatry in section 1, in section 2 I make a distinction between two different types of rationality – *procedural rationality* and *epistemic rationality*. In section 3 I apply to the special case of delusions the general thesis that psychiatric disorders are disorders of rationality. It turns out that the distinction between two types of rationality allows us to make sense of experimental work on the reasoning abilities of delusional patients. In section 4 I consider three competing accounts of the irrationality of delusional patients. Section 5 confronts two potential problems for generalising the thesis beyond delusional patients. In the final section I introduce a further type of rationality (*inclusive rationality*) and pose the question whether psychiatric disorders might nevertheless count as inclusively rational, despite being epistemically irrational.

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Address for correspondence: Department of Philosophy, University of Stirling, Stirling FK9 4LA, UK.

1. Normativity in Psychiatry and Neuropsychology

Let me start with a passage from Martha Farah's well-known book on the visual agnosias:

The explicit goal of the new field of "cognitive neuropsychology" is to relate models of normal cognition to neuropsychological phenomena, for the purpose of advancing our understanding of cognition in both normal and brain-damaged people. (Farah 1990 p.1)

How can attention to neuropsychological phenomena advance our understanding of cognition in normal subjects? It is standardly thought that neuropsychology can contribute to the study of normal cognition in two ways (Shallice 1988):

(A) The fractionation of cognitive abilities that we find in neuropsychological syndromes provides a valuable clue as to the functional architecture of particular cognitive systems. A classic example comes with the role that studies of visual deficits have played in the development and refinement of the hypothesis that there are two visual systems (Ungerleider and Mishkin 1982, Goodale and Milner 1992), as well as in Marr's theory of vision (Marr 1982).

(B) In conjunction with evidence from single neuron recordings and the various forms of brain imaging, as well as experimental work on animals, the study of specific impairments can help to identify the anatomical systems responsible for particular information-processing tasks in normal subjects. A classic example is provided by the role that the study of disorders of sensation like *achromatopsia* (loss of colour vision) has played in the plotting of the different areas of the visual cortex (Zeki 1993).

In both (A) and (B) the reasoning is clearly normative. In (A) one effectively subtracts the performance of a brain-damaged patient (or group of brain-damaged patients) from the performance of normal subjects to identify one or more of the processing components of normal subjects, while in (B) one carries out more or less the same subtraction in order to correlate the result with the lesioned area. The guiding assumption in both cases has been termed the assumption of *subtractivity* (Saffran 1982), namely, that the performance of a neuropsychological patient reflects total normal cognitive functioning minus those systems that have been impaired (rather than the operations of new post-traumatic brain structures). But what varieties of "normal cognitive functioning" are implicated here?

In the majority of neuropsychological disorders we find damage only to relatively elementary types of cognitive abilities. Consequently, the conception of normal cognitive functioning that underlies their diagnosis and classification is relatively thin. I will term it *weakly normative* and

describe the cognitive systems themselves as weakly normative systems.¹ These systems have the following four features.

- Their normal functioning is specifiable in anatomical, neurochemical and behavioural terms. For the purposes of diagnosis and classification, of course, the behavioural criteria are paramount. That these are relatively uncomplicated can be seen from the standard diagnostic tests for neuropsychological disorders. Unilateral neglect is standardly identified, for example, by crossing-out tasks in which a patient is asked to mark all the circles in an array of circles and crosses or simply by asking patients to draw copies of a figure.
- Their functioning does not vary enormously across individuals. This is probably most evident in the higher visual grouping processes that are impaired in apperceptive agnosics. There is little non-pathological interpersonal variation in the perception of overall form that subserves the grouping of local contours and colours into larger contours and bounded regions. One would expect most people in similar lighting conditions to discriminate much the same contours and boundaries. Other weakly normative systems manifest slightly more variation. Some people are better at recalling particular autobiographical events than others, for example and others may have more acute abilities to attend and focalise. But these interpersonal differences are negligible.
- They have most, if not all, of the features associated with modularity in Fodor's sense (Fodor 1983). That is to say, such systems possess a high degree of informational encapsulation, being relatively insulated from the processing going on in other cognitive systems. They are domain-specific, dealing only with certain highly circumscribed types of information, and are fast. Their outputs are shallow (best characterised as observational rather than inferential) and their operation mandatory (they are constrained to apply whenever they can apply).
- Deficits in weakly normative cognitive systems are stable. They break down in characteristic ways with determinate loss of function that is usually not intermittent (*modulo* puzzling phenomena like the remission of anosognosia through caloric stimulation, reported in Bisiach et al. 1991)

¹ In virtue of what do these cognitive systems count as normative, albeit in a weak sense? The important point is the correlation between normal functioning and proper functioning – that is, a weakly normative cognitive system that is functioning normally is functioning as it ought to function. It seems natural to think that the “ought” here should be understood at least partly in evolutionary terms, so that a properly functioning visual system, for example, is solving the perceptual problems which it evolved to solve. For some authors, of course, this is the fundamental form of normativity. As I go on to argue, however, it is a very weak form of normativity at best.

It should be clear even from this brief account that we cannot classify psychiatric disorders in terms of the breakdown of weakly normative cognitive systems. Central psychiatric disorders fail to qualify as impairments of weakly normative cognitive systems on all four counts.

- There is much less agreement on taxonomy of psychiatric disorders than on the taxonomy of neuropsychological disorders.² For example, the American Psychiatric Association's *Diagnostic and Statistical Manual*, the dominant approach to classifying psychiatric disorders in North America, eschews aetiological considerations altogether, grouping disorders purely in terms of observable symptoms. It is frequently suggested (e.g. Bolton and Hill 1997) that psychiatric diagnosis might best be effected by scores on different dimensions, as opposed to on a categorical model.
- Given that there is enormous variation across individuals both at the level of particular symptoms and in how those symptoms are combined, and that there are no easy tests that will uncontroversially establish the presence of a particular psychiatric disorder, it is natural to conclude that the cognitive abilities impaired in psychiatric disorders will also vary widely in normal subjects.
- Psychiatric disorders arise at a level of an individual's responses to their social and physical environment that is best described as volitional rather than mandatory. Of course, the disorders themselves are not subject to the individual's control, but the behaviour and impairments in which they manifest themselves are of the sort that would standardly be explained at the personal level, rather than at the subpersonal level.³ In the terms of Fodor's dichotomy, psychiatric disorders seem to be disorders of central processing rather than peripheral modules.
- Psychiatric disorders are not at all stable. Many symptoms can be relieved by pharmacological and/or psychodynamic therapy (Chadwick et al. 1996). Symptoms often evolve and transform themselves over time.

We need a richer conception of normativity to give a theoretical underpinning to the classification of psychiatric disorders and to these prominent differences between psychiatric and neuropsychological disorders.⁴ What norms are contravened by psychiatric patients? There is no single category. But in this paper I will pursue the suggestion that many of the symptoms of psychiatric disorders involve impairments of rationality – and consequently that the norms of rationality must be taken to play a vital role in the understanding of psychiatric disorders. The interdisciplinary possibilities here should be evident. Philosophers have been working for a long

² For further discussion of taxonomical issues in psychiatry see Poland, Von Eckhardt and Spaulding 1994.

³ For recent discussion of the personal/subpersonal distinction see the essays in Bermúdez and Elton 2000.

time on the theoretical understanding of the norms of rationality. But much of this work has been carried out without detailed consideration of the ways in which the norms of rationality can be breached - or more precisely, without detailed consideration of breaches of rationality other than those which we find in everyday weakness of will or self-deception. Conversely, although there has been discussion within psychiatry of the role of considerations of rationality in the classification and treatment of psychiatric disorders, this has not tended to be informed by philosophical models and theories of rationality. In the next section I will try to bring out some of the issues that serve to set up a constructive dialogue between philosophy and psychiatry.⁵

2. Procedural Rationality and Epistemic Rationality

The proposal is not, of course, that *all* psychiatric disorders can be understood as disorders of rationality - nor even that there are any psychiatric disorders that can be *wholly* understood as disorders of rationality. Even if there is a sense in which *post-traumatic stress disorder* qualifies as a failure of rationality, it is hardly exclusively such. The claim should also be distinguished from the proposal, characteristic of various forms of cognitive therapy, that psychiatric syndromes can best be treated by helping the patient to overcome the irrationality in which they are rooted. The therapeutic claim is far stronger than the analytic claim. The analytic claim does, however, have aetiological implications. The suggestion is that psychiatric disorders come about, at least in part, as a *consequence* of impaired rationality.

Bearing these qualifications in mind, the only hypothesis we are warranted in putting forward is the modest proposal that several of the key psychiatric symptoms can partly be understood as departures from certain norms that it is natural to describe as norms of rationality. The norms of rationality form a network of principles governing decision-making, reasoning and inference, and agents/reasoners are rational to the extent that they work within the framework set by those principles and recognise themselves as subject to those principles. As we shall see further below, these norms can be grouped in different ways in a way that allows us to pick out different types of rationality, but for the moment we can stick with the broad characterisation.

The plausibility of the general idea that psychiatric disorders are disorders of rationality emerges perhaps most clearly in one of the most central psychiatric symptoms, namely delusion. Delusions are almost always, of course, false beliefs. But they are a very distinctive category of false beliefs. There are many different ways of spelling out just what is distinctive about delusional beliefs (Oltmanns and Mayer 1988), but all share an emphasis on the imperviousness of delusional beliefs to countervailing evidence, however overwhelming that countervailing evidence might seem to a

⁴ I will discuss further below approaches to psychiatric disorders that seek to assimilate them to neuropsychological disorders – in particular the approach of cognitive neuropsychiatry (Ellis 1998, Young 2000).

⁵ For further, and more explicitly methodological, discussion of the relations between philosophy and psychopathology see Bermúdez 1995, 1998a and 1998b.

third-person observer. It is fairly clear why this should seem a breakdown in rationality. Rational believers must be sensitive to evidential considerations and shifts in the balance of those evidential considerations.

We can make a similar point about the forms of ritual obsessive behaviour associated with various types of anxiety disorder. Rational agents act with determinate goals in mind and reasonably defined conceptions of how those goals can be achieved by behaving in the relevant ways. They can assess the likely consequences of their actions and are apt to modify those actions when they do not have the desired result. Behaviour governed by this sort of means-end rationality seems diametrically opposed to the behaviour of the obsessive-compulsive patient. A patient who washes his hands a hundred times a day and explains himself by saying that they feel dirty clearly fails to qualify as rational in this sense. Why continue washing one's hands to get them clean when the fact that the hands continually need to be washed quite clearly indicates that washing is ineffective? The point here is not that the patient has an irrational belief, nor that there is anything intrinsically irrational about washing one's hands when they feel dirty. Rather, the irrationality lies in the failure to recognise the inefficacy of the hand-washing.

The basic thought that many psychiatric syndromes are disorders of rationality is not hard to motivate at this sort of level of generality. But things get much more interesting when we start to look at the details. Let me start with a preliminary point. As we have already noted, one of the distinguishing features of psychiatric disorders is that they arise at the level of the person rather than subpersonally. Although the person who suffers from schizophrenia or depression is not acting normally, their behaviour and utterances are often to be interpreted as the behaviour and utterances of someone who is acting intentionally and for reasons – although there are psychiatric disorders, particularly those involving compulsive forms of behaviour, to which the applicability of personal-level notions of responsibility and deliberation is complex and controversial. This immediately poses a puzzle to any theorist who believes there to be a close conceptual connection between (1) the concept of a person, (2) the concept of intentional action and (3) the concept of rationality. There seems to be a clear and obvious sense in which many psychiatric patients are not acting rationally. But how then can they be intentional agents acting for reasons and susceptible to the various forms of therapy that effectively count as forms of rational persuasion?

At one level the answer is obvious. The notion of rationality that many have argued to be constitutively linked with intentional agency must be "thinner" and less demanding than the notion of rationality according to which psychiatric patients are behaving irrationally. But it is no easy matter to spell this distinction out in any detail.

An initial suggestion might be that the sense of rationality constitutively linked with intentional agency be elucidated in terms of what might be termed *procedural rationality* – that is to say, sensitivity to certain basic principles of deductive and inductive inference. Subjects are

procedurally rational to the extent that they reason in accordance with familiar deductive principles as modus ponens, modus tollens, contraposition and so on, together with such basic principles of probability theory as that the probability of a conjunction can never be greater than the probability of its conjuncts; that the probability of a hypothesis and the probability of its negation should add up to 1; and so forth.

The plausibility of taking procedural rationality in this sense as intrinsic to the notion of intentional agency emerges when we consider a canonical way of thinking about practical reasoning, one that goes back at least to Aristotle's theory of the practical syllogism. On this view, practical reasoning is ultimately not very different from theoretical reasoning. It is essentially theoretical reasoning with a distinctive set of premises. A modern version of this way of thinking about practical reasoning emerges very clearly in the following passage from Donald Davidson:

If someone acts with an intention then he must have attitudes and beliefs from which, had he been aware of them and had he had the time, he could have reasoned that his act was desirable. . . . If we can characterise the reasoning that would serve, we will, in effect, have described the logical relations between descriptions of beliefs and desires, and the description of the action, when the former gives the reasons with which the latter was performed. We are to imagine, then, that the agent's beliefs and desires provide him with the premises of an argument. (1980 pp. 85-86)

Let us suppose that practical reasoning is argument-like in the way that Aristotle, Davidson and many others have suggested. Then it straightforwardly follows that we can only explain and predict the behaviour of others to the extent that we can understand the inferential relations between their beliefs, desires and so forth, on the one hand, and their actions on the other. And it seems natural to think that our understanding of the inferential relations between propositional attitudes and actions depends upon their conforming to the dictates of procedural rationality. If practical reasoning is essentially a form of deductive or inductive inference, a matter of the broadly logical relations between a set of premises (provided by a particular nexus of beliefs and desires) and a conclusion (the description of an action) then how could the norms governing it be anything other than the norms of procedural rationality?

Although working backwards in this way from the demands of a particular conception of practical reasoning provides a clear argument for the view that procedural rationality exhausts the notion of rationality, it is a view that is often accepted independently of any conception of practical reasoning both by philosophers and by psychologists. Edward Stein's recent book on the rationality debate in philosophy and cognitive science adopts almost without discussion what he calls the *standard picture of rationality*. Here are the brief comments he does make:

According to this picture, to be rational is to reason in accordance with principles that are based on rules of logic, probability theory, and so forth. . . . As described, the

standard picture of rationality is intuitively very plausible. It seems certain that the principles that we think are the normative principles of reasoning are in fact the normative principles of reasoning. To appreciate the appeal of the standard picture, compare the principles of reasoning with mathematics. Consider the statement 'Two plus two equals four'. This statement seems intuitively plausible. A theory of mathematics that says two plus two does not equal four would be highly implausible. Principles of reasoning based on rules of logic, probability and so forth seem equally well established. (Stein 1996, p.4)

Stein's unquestioning acceptance of the standard picture of rationality is in many ways a reflection of the conception of rationality dominant in the cognitive sciences and in empirical psychology. The centrality of the Wason selection task in psychological discussions of rationality displays the emphasis on procedural rationality. The Wason selection task is designed to test mastery of the rules that govern conditional reasoning - in particular *modus tollens* and contraposition. As is shown by discussion of the selection task (and indeed by discussion of other experimental tests of performance on some other basic principles of procedural rationality, such as the conjunction principle in probability theory) the central background assumption is that failure to adhere to those principles is a *prima facie* index of irrationality.

The main problem with this one-sided emphasis on procedural rationality is that it results in neglect of the role in evaluating rationality of norms of good reasoning. The norms of good reasoning are principles that govern the processes of drawing conclusions; weighing up the balance of evidence for and against a particular proposition; deciding upon a particular course of action; judging the likelihood of a particular event and so forth. These are all psychological processes that result in either changes of belief or alterations in one's plans, and the norms of good reasoning are the norms that can plausibly be taken to govern these processes.

The formal principles of logic and probability theory, in contrast, govern the relations between propositions. The principles of deductive logic determine whether or not relations of implication hold between propositions. A set of propositions imply a further proposition when it is impossible for the members of the set all to be true without the further proposition also being true. The principles of probability theory determine the probabilistic relations between propositions. There is a clear difference of type and character between normative principles governing the deductive or probabilistic relations between propositions and normative principles governing the psychological processes resulting in either changes of belief or alterations in one's plans.

It is true that it is often plausible to take it as a norm of good reasoning that one should strive to adhere to the formal principles of procedural rationality - that is, to make sure that one does not reason in ways that result in manifestly inconsistent beliefs or that commit one or other of the formal fallacies, such as affirming the consequent or denying the antecedent. Let me term this the *norm of consistency*. But it is also true, first, that such a general norm is defeasible and, second, that

there are many norms of good reasoning that are not reducible to sensitivity to the norm of consistency. I will take these in order.

The thesis that the norm of consistency is defeasible can be motivated in several ways. Perhaps the simplest comes from reflecting on the practical limitations of time, attention and sheer processing capacity that beset any real-world and real-time reasoner. It cannot be rational to pursue the distant deductive consequences of all one's beliefs, nor to try to demonstrate that a particular set of beliefs must be consistent. Nor, indeed, is it always rational to respond to a manifest inconsistency in one's beliefs by seeking to eliminate it. For one thing, there may be more pressing epistemic tasks to carry out, which it would be correspondingly irrational to set to one side. For another, it is far from clear that it is always irrational to have contradictory beliefs, as the lottery and preface paradoxes strikingly illustrate.⁶ As far as probabilistic reasoning is concerned, the problems with establishing that any rational agent's probability assignments must adhere to the principles of the probability calculus are well-known. The most popular argument for such a requirement is the puzzlingly-named Dutch Book argument, which essentially points out that an agent whose probability assignments do not obey the principles of the probability calculus is open to a series of bets that he or she would be guaranteed to lose (and also would recognise as such). As many authors have pointed out, this is of course unlikely to trouble anyone who either avoids bets on principle or doesn't mind losing money – or indeed who rejects any of the argument's several key assumptions (see Kaplan 1996, 155-160). It seems unlikely that there will be a general argument to show that any rational agent must abide by the Kolmogorov probability axioms.

It doesn't look, then, as if the norm of consistency can possibly be the *only* norm of good reasoning. And nor should this be surprising. One might have reached the same conclusion by noting that neither the formal calculi of deductive reasoning nor the probability calculus have anything to say about how one should revise one's beliefs in the face of new evidence. The propositional and predicate calculi can identify an inconsistent set of beliefs, but they cannot recommend that one belief rather than another should be removed to restore consistency. And the probability calculus has nothing to say about evidence at all. Since good reasoning obviously involves revising one's beliefs in the light both of their deductive interconnections and of new evidence, it follows that there must be norms of good reasoning over and above the norm of consistency.

⁶ The lottery "paradox" will illustrate the point. Imagine a lottery with 1,000 tickets. You know that the lottery is fair and that a winning ticket will be drawn. In fact, you are subjectively certain about this. Each ticket in the lottery has only a 0.001 probability of winning, and hence a 0.999 probability of not winning. Assuming that, as far as you are concerned, a probability of 0.999 is sufficient for rational belief (and if not the number of tickets in the lottery can be adjusted until the right figure is reached), it follows that for any individual ticket in the lottery it is rational to believe that it won't win. So, it is rational for you to believe that ticket #1 won't win, that ticket #2 won't win, that ticket #3 won't win, and so on up to ticket #1,000. Since you also believe that some ticket will win, your overall belief set is inconsistent. Yet all the beliefs in the set are rational, and derived by a process of rational belief formation. The thesis that the lottery paradox reveals the rationality of inconsistent beliefs is defended in Foley 1991. The idea is worked out formally in some detail in Hawthorne and Bovens 1999. Further discussion of how it can be rational to hold apparently contradictory beliefs will be found in Bermúdez 2000c.

There are two possible positions here that it is important to keep distinct. The existence of norms of good reasoning over and above the norm of consistency does not entail that these additional norms are not codifiable at all in a formal theory. It would be perfectly consistent to maintain, as proponents of Bayesian epistemology maintain, that these additional norms of good reasoning should be understood in terms of further formal principles like the conditionalisation principle.⁷ But, *prima facie*, it seems more attractive to make the stronger claim that the norms of good reasoning cannot be fully codified at all in a formal theory. The conditionalisation principle takes assigned prior probabilities as given. But surely there are no principles governing the assignment of prior probabilities. And even if there are formal principles governing such assignments, it is hard to see how there could be principles governing the actual process of looking for and acquiring evidence. What would be the formal version of the norm of good reasoning that one should actively seek out evidence relevant to the truth-value of one's beliefs and apportion one's degrees of belief accordingly?

Be that as it may, for present purposes all that is required is the plausibility of the general distinction between the formal principles of the logic of consistency and the norms of good reasoning. Gilbert Harman is one philosopher who has been very sensitive to this difference (see, e.g. Harman 1999). The conclusion he draws is that logic (broadly construed to include deductive logic and probability theory) is not directly relevant to rationality at all. Rationality is a notion applicable only to the psychological processes of decision-making and belief formation/adjustment, and logical principles do not directly govern these psychological processes. Logic, in other words, is not a theory of reasoning:

Logic and probability theory are not directly theories of rationality and reasonableness and, furthermore, it is a misuse of language to say that violations of principles of logic and probability theory are indications of irrationality and unreasonableness. We do not normally consider someone to be 'irrational' or 'unreasonable' simply because of a mistake in arithmetic, or probability theory, or logic. Instead we use the words 'irrational' and 'unreasonable' in a rather different way; for example, for those who refuse to accept 'obvious' inductions, or for those who jump to conclusions on insufficient evidence, or for those who act knowing that they are frustrating their own purposes, or for those who are uncooperative. (Harman 1999, p.45)

Without getting bogged down in linguistic intuitions, it seems to me that Harman is not considering the full range of options. He is surely right that isolated slips in logic, arithmetic or calculations of probability do not betoken the presence of irrationality. And he is surely also correct that irrationality often consists in jumping to conclusions, failing to accept obvious inductive inferences, and so forth. But it is not appropriate to draw the conclusion that the principles of logic and probability theory are not normative principles of rationality. It is true that the principles of logic

⁷ Kaplan 1996 is a good introduction to Bayesian decision theory.

and probability theory are concerned with the relations of implication and probabilification that hold between propositions, rather than directly with the psychological processes of inference and practical decision-making. But the link between the logical and the psychological becomes much easier to see when one remembers that propositions are the objects of belief, and that the psychological processes of inference and practical decision-making are best modelled as transitions between propositions.⁸

Reasoners who affirm the consequent or deny the antecedent are not necessarily irrational – provided that they can be brought to recognise their error and to understand what the valid inference would have been. But if they refuse to accept that they have done anything wrong, or they repudiate the principles that they should have adopted when those principles are put to them, then they are irrational. Harman's extreme position is based on an overly narrow conception of the way in which principles of the logic of consistency might function as norms of rationality. The principles of logic and probability theory are not normative principles of rationality in the sense that any transgression is immediately open to censure. But that doesn't mean that they are not norms of rationality at all. They should be viewed as prescriptive principles that rational agents can reflectively employ to control and police their own deliberations (Levi 1995, Bermúdez 2000a).

There are interesting and deep questions to be raised about the relative importance of the normative principles of logic within the overall notion of rationality. One might ask, for example, as we have already done, when and how the normative principles of logic and probability can be trumped by demands coming from elsewhere within the sphere of rationality. The point here is that an adequate account of rationality must be sensitive to the various different constraints and requirements that rationality imposes. But issues like these lose their force and interest if we make too sharp a divide between logic and reasoning. It is both more theoretically profitable, and more faithful to the way in which we actually reason and control our reasoning, to distinguish two types of rationality. *Procedural rationality* consists in reasoning in ways that conform to the formal principles of the logic of consistency, while one is *epistemically rational* to the extent that one reasons in accordance to the norms of good reasoning. Whereas procedural rationality is a matter of inference, of the conclusions that it is appropriate to draw from a given belief or set of beliefs, epistemic rationality is principally a matter of the dynamical relations of how beliefs relate to evidence and how they should be changed in response to changes in the structure of evidence.

3. Impairments of Rationality in Schizophrenic and Other Delusional Patients

⁸ This is not to suggest that the relation between the normative principles of logic and probability theory and the actual practice of reasoning is simple or straightforward. Quite the contrary (see Bermúdez 1999a, 1999b, 2000a and 2000b and the essays in Bermúdez and Millar forthcoming for further discussion). The point is just that the principles of logic and probability theory are normatively binding on reasoners - although, as we have seen, these norms are defeasible norms.

Most of the experiments that have been done on the cognitive abilities of psychiatric patients have concentrated on very simple indices, like comparisons of pre- and post-morbid levels of IQ or performance on tasks like the Continuous Performance Task (Frith et al. 1991).⁹ Since the abilities tested are not really reasoning abilities it is hard to draw any conclusions about the degree of rationality or irrationality involved. More sophisticated tests have been carried out, however, on delusional patients, particularly schizophrenics. This section considers whether what is known of the reasoning abilities and habits of patients in this grouping supports the general hypothesis that psychiatric disorders are disorders of rationality.

In considering schizophrenia it is important to distinguish between the positive and the negative symptoms of the disorder (Crow 1980), although the rough distinction can be conceptualised in different ways (Frith 1992). The positive symptoms appear in acute schizophrenia, while the negative symptoms are characteristic of chronic schizophrenia. It is often the case that the positive symptoms will disappear in patients who are still classified as schizophrenic in virtue of showing negative symptoms. Positive symptoms respond favourably to treatment with neuroleptic drugs. Negative symptoms do not. As standardly construed, positive symptoms are those, like hallucinations and delusions, whose presence is abnormal, while negative symptoms are those like poverty of action or poverty of thought, that are abnormal in virtue of what is missing. This way of characterising the distinction is not without its problems. As Frith has pointed out (1992, p.11), it would seem to classify as positive certain symptoms such as repetitive speech or the repeated performance of pointless acts (since their presence is abnormal) even though they are associated with chronic rather than acute schizophrenia. But for present purposes the important point is that the presence of both negative and positive symptoms in schizophrenia presents an immediate obstacle to attempts to characterise schizophrenia in terms of disordered rationality. It seems highly unlikely that both the positive and the negative symptoms of schizophrenia will be describable as disorders of rationality in anything like the same way.¹⁰

The distinction between procedural and epistemic rationality that emerged in the last section can be pressed into service at this point. Recall that subjects are procedurally rational to the extent that they reason in accordance with the formal principles of the logic of consistency, while they are epistemically rational to the extent that they follow the norms of good reasoning. It is a natural hypothesis that the positive symptoms of schizophrenia will be correlated with impairments of epistemic rationality. As we remarked earlier, the central positive symptom of delusion seems *prima facie* to contravene the basic principles of epistemic rationality in so far as the delusional

⁹ On the CPT subjects are shown a sequence of letters on a video screen, one every 1.5 seconds. The task is to press a button every time a certain letter was flashed up, except when that letter is preceded by another designated letter. Frith and his collaborators applied a range of such tasks to schizophrenics. They found impaired performance on those tasks in patients suffering from the negative symptoms of schizophrenia, and from the positive symptoms of incongruity of affect and incoherence of speech.

¹⁰ As will emerge in the next section, some treatments of impaired rationality in schizophrenia do not take the negative symptoms into consideration at all.

patient is in the grip of a distorted perspective on the world. In contrast, the negative symptoms are not so easily seen as involving disordered epistemic rationality. Poverty of affect, incoherence and stereotyped behaviour do not seem to involve breakdowns in evaluating evidence, judging the likelihood of events, drawing conclusions and so forth. The negative symptoms do not manifest themselves in a distorted perspective on the world. They are best viewed, rather, as ways in which patients detach themselves from the world (which is why they have often been analysed as coping strategies adopted to deal with the psychological stresses imposed by the positive symptoms).

It may well be the case that the negative symptoms of schizophrenia are correlated with an impairment of procedural rationality. This would certainly mark them out from the positive symptoms, since it is known that cognitive impairments tend to be correlated only with negative symptoms (Frith et al. 1991) – and indeed it has been estimated that 25% of hospitalised chronic schizophrenics are operating at essentially demented IQ levels (Stevens et al. 1978). But there is as yet little hard data that would allow this hypothesis to be evaluated. Studies of the reasoning abilities of schizophrenics have concentrated on the positive symptoms, and it is to these that we now turn.

The general suggestion that the positive symptoms of schizophrenia can be partly explained in terms of impaired epistemic rationality incorporates two separate proposals. The first is the idea that procedural rationality is relatively unimpaired in acute schizophrenic patients whose symptoms are largely positive, while the second is that positive schizophrenic symptoms can be understood as deficits in epistemic rationality.¹¹

On the first of these it is worth pointing out that several influential accounts of the positive schizophrenic symptoms tacitly assume normal functioning of the mechanisms of belief formation that are most naturally described as procedural. Maher, for example, has argued at length that delusional thinking in general is the product of applying normal logical processes to abnormal perceptual or introspective experiences (Maher 1988, 1999). He suggests that delusional thinking is not itself aberrant, but that the delusions are best thought of as theories that provide order and meaning for anomalous data obtained through observation. Without going as far as Maher in comparing delusional patients to scientists, there still seems to be a sense in which delusional belief systems can be the result of sound inferences applied to anomalous data. This is clearly implicated in Frith's theory of the positive symptoms of schizophrenia as resulting from a breakdown in self-monitoring. The patient who hears a voice and fails to recognise it as his own because of some breakdown in the self-monitoring process must make an inference about where it comes from and who is speaking for the delusion to emerge.

¹¹ It is worth pointing out that there is a significant difference in the direction of fit between the suggestion that the negative symptoms of schizophrenia might be understood in terms of impaired procedural rationality and the proposal that the positive symptoms should be understood in terms of impaired epistemic rationality. There can be no suggestion that the negative symptoms of schizophrenia come about *because of* impairments in procedural rationality. The direction of explanation goes from negative symptoms to impaired procedural rationality. As we

Many delusional schizophrenics, particularly those suffering from so-called paranoid delusions, manage to construct a remarkably consistent and coherent view of the world. Apparently recalcitrant data are fitted into the web of delusional belief, their consequences noted and assimilated. Procedural rationality is, as we have observed, primarily a matter of consistency, and the internal consistency of the schizophrenic's delusional belief system is well known. This relatively unimpaired functioning of procedural rationality is not unique to the delusions of schizophrenia. Similar points can be made about the confabulation that we find in anosognosics (patients who delude themselves that they are not suffering from severe impairments such as blindness that ought to be manifest to them). Confabulation often proceeds in a procedurally impeccable manner. A good example comes in a frequently cited examination carried out by Eduardo Bisiach (1988) on a patient who was simultaneously anosognosic for left-field blindness and left-side paralysis. When Bisiach placed the patient's paralysed hand between his own two hands and asked the patient whose hand it was, the patient replied that the hand belonged to Bisiach. The conversation continued

Examiner	Whose hands are these?
Patient	Your hands.
Examiner	How many of them?
Patient	Three.
Examiner	Ever seen a man with <i>three</i> hands?
Patient	A hand is the extremity of an arm. Since you have three arms it follows that you have three hands. (Bisiach 1988)

It is clear that the patient's procedural rationality is (relatively) unimpaired. The inference from the proposition that anyone who possesses an arm possesses a corresponding hand and the proposition that the examiner possesses three arms to the conclusion that the examiner possesses three hands is valid. The real problem comes because the patient chooses to interpret the inference as a form of modus ponens, affirming both antecedent and conditional, rather than applying modus tollens and working backwards from the manifest falsity of the conclusion to the falsity of the antecedent. This, as we saw earlier, falls within the domain of epistemic rather than procedural rationality (since logic will not dictate whether or not to affirm a particular proposition and can only tell one what conclusions one is entitled to draw once one has affirmed it).

A limited amount of work has been done on testing the procedural rationality of delusional patients. In response to a suggestion from Von Domarus (1944) that schizophrenic delusions may be the result of defective syllogistic reasoning, studies have found that there are no substantial differences in syllogistic reasoning between schizophrenics and normal subjects, provided that each individual patient's IQ and education levels were suitably matched in the control group (Williams

shall shortly see, however, the direction of explanation is precisely the opposite in the case of the positive symptoms.

1964, Kemp et al. 1997). Both groups make roughly comparable patterns of mistakes in syllogistic reasoning. Kemp et al. found, for example, that both deluded patients (14 of whom were diagnosed with schizophrenia) and controls were influenced by the emotional content and the believability of the conclusion. Still on the theme of deductive logic, some investigations have also been made into the performance of schizophrenic patients on conditional reasoning tasks, for a long time the main focus of experimental research into human reasoning (Kemp et al. 1997). Here too it was found that there were no significant differences between the deluded patients and controls.

Research into the probabilistic reasoning of delusional patients has suffered from failing to recognise the distinction between the procedural and epistemic dimensions of probabilistic reasoning. There is a widespread failure to distinguish those experiments that test a patient's grip on the basic principles of the probability calculus from those that test the patient's performance relative to the epistemic norms of evidence-gathering, evidence evaluation and so forth.¹² This has led to generalisations being made about the probabilistic reasoning of the schizophrenic as if probabilistic reasoning were a single monolithic capacity – whereas we need to distinguish procedural probabilistic reasoning from epistemic probabilistic reasoning. The few experiments that have been done in this area do seem to show that the performance of schizophrenic patients is not significantly impaired in the first of these two types of reasoning. A well-known test of mastery of the basic principles of probability is a paradigm developed by Kahneman and collaborators (Kahneman et al. 1982). Subjects are presented with a short description of an individual and asked which of three statements is more likely to be true of that person. The third statement is a conjunction containing the second statement as one of its conjuncts (as in the classic example of the two statements 'Linda is a bank-teller' and 'Linda is a feminist bank-teller'). When the third statement fits in well with the brief sketch of the person, subjects reliably judge it more likely to be true than the second - even though it is impossible for a conjunction to be more probable than one of its conjuncts. Kemp et al. found that schizophrenic patients much the same as the normal controls. Both groups regularly committed the so-called conjunction fallacy.

As far as transgressions of the fundamental principles of deductive logic and the probability calculus are concerned, schizophrenic patients do not seem to perform significantly worse than normal subjects. Does this mean that they are unimpaired at the level of procedural rationality? It

¹² Some authors have come close to recognising the distinction between procedural and epistemic rationality. In a recent survey article Garety and Freeman point to the importance of evaluating reasoning relative to Bayesian norms, rather than in terms of the ability to grasp and manipulate the formal principles of deductive logic (Garety and Freeman 1999). They write: "Bayesian inference provides a general framework for evaluating beliefs as they are formed and maintained, since it incorporates the level of the prior belief and governs the way in which the strength of one's belief in a hypothesis should be revised in the light of new information" (p.123). The distinction that Garety and Freeman are drawing, however, is narrower than that between epistemic and procedural rationality, for two reasons. The first is that they do not seem to recognise that probabilistic reasoning has both a procedural and an epistemic dimension. The contrast they draw is between deductive logic, on the one hand, and probabilistic reasoning, on the other. Second, and as we saw in the previous section, there is much more to epistemic rationality than simple adherence to the norms of Bayesian inference. The Bayesian principles are silent on the

certainly provides strong support for the thesis, but a caveat must be registered. As we saw when discussing Harman's claim that the laws of logic are not normative principles of rationality, an important element in procedural rationality is that thinkers should reflectively employ them to control and police their own reasoning. The experiments of Kemp et al. and others are silent on this. It would be interesting to know, for example, if deluded subjects show the same alacrity in recognising their errors and correcting their judgments. If they do not then one should not conclude that their procedural rationality is completely unimpaired. Further investigation is required.

Let us turn now to the second strand of the proposed account of schizophrenia – the idea that positive schizophrenic symptoms can be explained, at least in part, as deficits in epistemic rationality. One way of denying this second claim would be to affirm, with Maher and others, that the reasoning processes of the acute schizophrenic are completely unimpaired (see Maher 1999 for a recent formulation of this view). On Maher's view the onset of the positive symptoms of schizophrenia is to be explained purely in terms of intense and highly anomalous experiences undergone by the subject.

One potential difficulty for Maher's view is the existence of delusions with no apparent basis in anomalous experiences (Chapman and Chapman 1988). Persecutory delusions are a case in point. Although persecutory delusions may be analysed at least in part as mechanisms of self-defence responding to abnormally low self-perception (Bentall, Kaney and Dewey 1991), there is no reason to think that such self-perception will be associated with an anomalous perceptual experience. But the basic problem with the extreme view pressed by Maher is, quite simply, that there *does* seem to be something wrong with the reasoning processes of the acute schizophrenic. In support of his thesis of the rationality of delusional beliefs Maher (1988) cites a case described in 1912 by E. E. Southard of a woman admitted to hospital with the delusion that her skull was filled with bees (Southard 1912). A subsequent autopsy revealed that she was suffering from a softening of the bones of the skull with consequent pressure on the brain and probable mechanical stimulation of receptor areas. But the results of the autopsy show merely that there was some experiential ground for the delusion. They hardly support Maher's claim that the delusion was a non-aberrant response to that experiential ground.

Nonetheless, the full range of theoretical possibilities at this point is often not fully recognised in the literature. It is frequently assumed (in Frith 1992, for example) that the only alternative to Maher's view is that the acute schizophrenic is employing abnormal processes of deduction that leads to the formation of false beliefs. After rejecting the Maher view that delusions are the product of normal reasoning processes applied to abnormal perceptual experiences, Frith characterises the alternative as being that "delusions reflect the faulty application of logic" (1992 p.79). As we have seen, however, there is not a simple choice between normal reasoning processes and the faulty

question of how we should assign prior probabilities, for example – they merely tell us how to modify the ones

application of logic. There are ways in which normal reasoning processes can go seriously awry that are compatible with unimpaired logical thinking (unimpaired, that is, relative to populations of normal subjects). Such impairments of epistemic rationality can have a crucial role to play in the generation of delusional beliefs, as examples throughout this paper show.

Moreover, there is a crucial distinction between the establishment of a delusional belief and the maintenance of that belief. It is possible that the formation of a delusional belief might be procedurally rational even though its maintenance is epistemically irrational. Recall that the domain of epistemic rationality is the dynamical relations of how beliefs relate to evidence and how they should be changed in response to changes in the structure of evidence. As we saw earlier, belief revision is rarely, if ever, a deductive matter. And it is clear that it can never be a *purely* deductive matter. Deductive reasoning can tell one that a given set of beliefs is inconsistent, but it is unable to advise on which belief to reject to restore consistency. And it is here that we move from the domain of procedural rationality to the domain of epistemic rationality.

Epistemic rationality is determined by norms that govern the acquisition and processing of evidence relevant to a given belief. There are several prominent such norms that seem blatantly to be ignored by delusional patients in general (Hemsley and Garety 1986). For example, it is a norm of reasoning that in evaluating the evidential status of a belief one should be sensitive to the prior probabilities. For most beliefs this will involve recognising that the belief has a certain probability of being true and, correlatively, a certain probability of being false. Yet it is characteristic of delusional patients not to entertain the possibility that the delusional belief might be false. Relatedly, it is also a norm of good reasoning to search for evidence that might confirm or disconfirm a given hypothesis. Yet delusional patients either fail to engage in such search or filter out any non-confirmatory evidence. In fact, many delusional belief systems are constructed in such a way as to be effectively untestable and irrefutable. Lastly, we might identify a sensitivity to the likelihood ratio as a further norm of reasoning. But delusional patients are notoriously poor at considering the probability of the datum to be explained occurring in the absence of the explanatory factor put forward (Garety and Hemsley 1994).

It is important to address a general worry concerning the possibility of explaining delusions in terms of impaired reasoning abilities. An important class of delusional disorders are monothematic (that is to say, they each involve a highly determinate single delusion) and highly circumscribed (patients tend not to pursue the logical implications of their delusions very far). Patients suffering from Capgras syndrome, for example, believe that someone close to them has been replaced by a double or an impostor. Patients with Cotard's syndrome believe that they are dead, while those suffering from reduplicative paramnesia believe that their environment has been duplicated and that they are in an identical environment in a different location. It has been suggested that the

that we have.

monothematic and circumscribed nature of these and other delusions of misidentification shows that there is no global impairment in reasoning ability (Young 2000). The thought here is presumably that if global impairments in reasoning ability result in delusions at all they will produce delusional belief systems that are polythematic and global. This is a serious difficulty for proposals to explain delusions in terms of impaired reasoning abilities, but it is not as telling as it is often taken to be. There are three points that it is important to stress in this context.

In the first place, not all delusions are circumscribed and monothematic. Many schizophrenic patients have delusional belief systems that are polythematic and global. The more "florid" delusional symptoms have not received as much attention from theorists influenced by the general approach to delusions known as *cognitive neuropsychiatry* (Ellis 1998) as the more tractable delusional syndromes, such as the delusions of misidentification (including Capgras and Cotard delusions, as well as the *Frégoli delusion* in which patients form the delusional belief that other people are carefully disguising themselves and *Paraprosopia*, the belief that the faces of others have become horribly disordered). These disorders lend themselves to the cognitive neuropsychiatric approach, which attempts to transfer the methodology of cognitive neuropsychology to psychiatric disorders, precisely because they combine circumscribed and monothematic delusions with a relatively clear-cut organic pathology. But from the classical psychiatric viewpoint the florid delusions are in many ways more central, as well as being considerably more numerous. The first point, therefore, is that even if the approach I have been suggesting cannot be applied to circumscribed and monothematic delusions, it remains applicable to an extremely important class of delusions.

But in fact the inference from the circumscribed and monothematic nature of some delusions to the impossibility of explaining them in terms of impaired reasoning is not as convincing as it initially appears to be. It is important in appreciating this to separate out the circumscribed dimension of these delusions from the fact that they are monothematic. As will be discussed in more detail in the following section, delusions of misidentification should be understood at least in part in terms of the highly abnormal perceptual experiences that precipitate them. If the account of Capgras delusion put forward by Stone and Young (1997) is correct, then the origins of the delusion lie in the abnormal experience of perceiving a familiar face in the absence of the standard affective response to that face. The delusion is a way of explaining and coming to terms with the perceptual abnormality. But, if this is right and it has powerful evidence in support of it (Ellis and Young 1990), then it is hard to see how one could expect the delusion to be anything other than monothematic. If what I have been suggesting is true then the delusion will not emerge without impaired epistemic rationality on the part of the patient (and, as we shall see in the next section, Stone and Young's account is broadly compatible with this suggestion). But the delusion emerges because of the combination of impaired epistemic rationality and abnormal perceptual experience.

One would not expect the delusional beliefs developed in response to abnormal perceptual experiences to extend to domains other than those relevant to those experiences.

This is not to say that delusions only emerge in response to abnormal perceptual experiences. As we saw earlier any such claim would be false (Chapman and Chapman 1988). It is natural to think that impairments of epistemic rationality will only generate delusional belief formation in response to some sort of “dissonance” in a broad and non-technical sense – but abnormal perceptual experiences represent only one way in which such dissonance can emerge. Nor does it imply that all impairments of epistemic rationality result in delusions (and hence, conversely, that a non-deluded subject will *ipso facto* be epistemically rational). Delusions are highly specialised phenomena and represent only one way in which impairments of epistemic rationality can manifest themselves. Epistemic rationality can be impaired in different ways and to greater or lesser extents.

None of this, however,, explains why the delusional beliefs of patients suffering from delusions of misidentification should be circumscribed. These patients make little effort to pursue the consequences of their delusional beliefs. Patients with Capgras delusion, for example, tend not to ask what has happened to the spouse or family member whom they think has been replaced by an impostor, and this is very puzzling. As we have just seen, it is reasonably comprehensible why delusions of misidentification should be monothematic, restricted to the sphere of experience affected by severe perceptual abnormality. But why should they be circumscribed? Why should patients fail to pursue the logical consequences of their deluded beliefs?

It seems clear that the problem is not that the patients are unaware of the logical consequences of their deluded beliefs. Consider the following conversation between an examiner and a 44-year old man suffering from Capgras delusion who was convinced that his house and family had been duplicated (from Alexander et al. 1979, quoted in Stone and Young 1997, pp. 334-335):

Examiner Isn't that [two families] unusual?

Patient It was unbelievable.

Examiner How do you account for it?

Patient I don't know. I try to understand it myself, and it was virtually impossible.

Examiner What if I told you I don't believe it?

Patient That's perfectly understandable. In fact, when I tell the story I feel that I'm concocting a story. It's not quite right. something is wrong.

Examiner If someone told you the story, what would you think?

Patient I would find it extremely hard to believe. I should be defending myself.

There is no breakdown in procedural rationality here. The patient is perfectly able to work out the logical consequences of his belief. This of course is why he finds the whole situation so deeply

troubling. He knows what the logical consequences are, but is neither able to integrate them with the rest of his belief system nor to abandon the deluded beliefs.

But once the point is put in these terms it becomes highly plausible that the circumscribed nature of deluded beliefs is just as much a reflection of difficulties at the level of epistemic rationality as the emergence and maintenance of the delusion in the first place. The problem is, in broad terms, a problem of belief revision. The deluded belief is too deep-seated to be subject to the norms of belief revision, which in this case seem strongly to dictate the application of *modus tollens* to the deluded belief. Yet, while appreciating and fully comprehending the propositions that are entailed by the deluded beliefs the patient is unable and unwilling fully to endorse them. Case studies like those in Breen et al. 2000 seem to indicate that delusions of misidentification are at their most powerful when the patient is actually in the grip of the abnormal perceptual experiences that are partly responsible for them. It is when the patient suffering from mirrored-self misidentification is actually in front of the mirror that he is most convinced by the content of his deluded beliefs. The vividness of the perceptual experience makes them plausible. But the further the logical consequences of the perceptually-inspired deluded beliefs are pursued, the less effect this vividness has on the patient. A patient confronting his own reflection in the mirror may well find it compelling that he is looking at a duplicate of himself, because this is a way of making sense of the alien experience brought about by deficits in face-processing. But there are many propositions logically entailed by the duplicative hypothesis that are not impressed on the patient with the same force by the alien character of his experience. Hence the circumscribed nature of the delusion.

Let me end this section by considering what might seem an unattractive implication of the general position that I am developing.¹³ I have suggested that we can understand the monothematic nature of a delusion of misidentification in terms of the specific nature of the experiential abnormality that gives rise to it – in conjunction, of course, with a general impairment of epistemic rationality. Does this not commit me to claiming that patients suffering from generalised deficits of epistemic rationality are going to be prone to form delusional beliefs in response to any form of abnormal perceptual experience – and hence for example to the prediction that a delusional patient repeatedly subject to a perceptual illusion will form the corresponding false belief? This seems implausible. Fortunately, given how unlikely it is that such a prediction will be confirmed, this is not a consequence of my general position. There are important differences between delusions and illusions (Austin 1962, pp.23-25). For one thing, illusions, unlike delusions, tend to be responses to phenomena that are publicly and intersubjectively accessible. Relatedly, the perceptual abnormalities involved in perceptual illusions do not have the same affective resonance as the perceptual abnormalities associated with the formation of delusional beliefs. So, for example, the perceptual abnormality in Capgras delusion is often suggested to be a familiar face that is perceived without the standard autonomic affective responses that the sight of that face would

¹³ I am grateful to an anonymous referee for drawing my attention to this potential difficulty.

normally generate in the subject (Stone and Young 1997). And it is relatively easy to see how this would be affectively disturbing enough for a subject with impaired capacities for epistemic rationality to form the (for us) massively implausible hypothesis that the owner of the face is an impostor replacing a loved one. No similar line of reasoning suggests itself in the case of a delusional subject confronted with the Müller-Lyer illusion, or any other standard perceptual illusion. The genesis of monothematic delusions requires more than simply the conjunction of an abnormal perceptual experience and impaired epistemic rationality. The abnormal perceptual experience has to be of a particularly affectively significant type. It is the affective dimension of the abnormal experience that demands that it be “taken at face value” – and hence that ultimately leads, via the impairments in epistemic rationality, to the formation of delusional beliefs. But there is no such impetus in the case of ordinary perceptual illusions.

4. Competing Accounts of Delusional Irrationality

In this section I consider the relation between the suggestions I have made about the role of impaired epistemic rationality in the genesis and/or maintenance of delusions and other accounts that have been (or could be) given of delusional irrationality. I will suggest that each of the three competing accounts I consider is valid in its own terms, but that they do not get to the heart of the phenomenon. Each of the types of irrationality that they describe is more perspicuously described as a deficit of epistemic rationality.

Let me start with a proposal that has not been explicitly put forward but that has been discussed in the recent literature (Davies and Coltheart 2000, Gold and Howhy 2000). The proposal, drawing on an idea mentioned in passing by David Lewis, is that we should view delusional irrationality not in terms of impaired reasoning, but rather in terms of fundamentally defective content. Here is the passage from *On the Plurality of Worlds* in which David Lewis distinguishes what he calls content irrationality from instrumental irrationality (which subsumes impaired functioning of both procedural and epistemic rationality):

Instrumental rationality, though it is the department of rationality that has proved most tractable to systematic theory, remains only one department among others. We think that some sorts of belief and desire (or, of dispositions to believe and desire in response to evidence) would be unreasonable in a strong sense - not just unduly sceptical or rash or inequitable or dogmatic or wicked or one-sided or short-sighted, but utterly unintelligible and nonsensical. Think of the man who for no special reason expects unexamined emeralds to be grue. Think of Anscombe's example of someone with a basic desire for a saucer of mud. (Lewis 1986, p.38)

On this view, delusions are irrational simply in virtue of their content. Their irrationality is not a matter of the reasoning that led to the formation of the delusion - nor of the patients's failure to

engage in the sort of reasoning that one might expect to have led them to revise their delusional beliefs.

This proposal is more suitable for some delusions than others. It seems most plausible for some of the more extreme delusions of misidentification (such as those reported in Breen et al. 2000). There certainly is something content-irrational about the belief (Cotard's delusion) that one is dead – because, to put it mildly, the belief is pragmatically self-defeating. It is far from clear that it can even be coherently expressed by the patient, there being something paradigmatically self-defeating about the utterance "I am dead". Other delusions can be coherently formulated but yet still seem to count as content irrational in Lewis's sense. Capgras delusion, in which patients believe that close friends and relatives have been replaced by more or less indiscernible duplicates, is a case in point. But, as has been pointed out (Gold and Hohwy 2000), many delusions just do not seem to fit the bill. They are not totally absurd and there are conceivable situations in which it might make perfectly good sense for a rational agent to entertain the delusional scenario as a live possibility. One thinks here of delusions of persecution.

But the real problem with the content irrationality proposal is that the content irrationality of delusional beliefs is a derivative phenomenon. It derives from failures of epistemic rationality. The conceivable situations in which a perfectly rational agent would be warranted in believing that people are out to get him are ones where the evidence available to the agent seems to point to that hypothesis. Conversely, the reason the patient suffering from delusions of persecution is irrational is not that, to borrow Lewis's phrase, there is something "utterly unintelligible and nonsensical" about the idea that he might be the object of persecution. The irrationality comes because the belief is wildly underdetermined by the evidence available to the patient; because the patient does not test the hypothesis or seek out further evidence in anything like the proper manner; and because the patient does not properly integrate the delusional hypothesis with the rest of his or her beliefs. In other words, the problem is one of epistemic rationality.

Gold and Hohwy, although taking exception to the general idea that delusions might be content irrational, offer what is in effect a highly specialised type of content irrationality to explain schizophrenic delusion. They suggest that what makes schizophrenic delusion irrational is a failure of what they call *egocentricity*. Egocentricity is "the property of a thought that allows the thinker of that thought to recognise it as having originated in his mind" (Gold and Hohwy 2000). One might view personal-level egocentricity as the personal-level product of the subpersonal-level processes of self-monitoring (e.g. the processes of monitoring willed intentions) whose breakdown Christopher Frith identifies as the primary motor cause of schizophrenia (Frith 1992):

If Frith's model is correct, then in thought insertion the subject has the thought 'Catch the bus!', but because there is no monitoring of willed intention, the subject does not have available to him an explanation of the source of that thought – an explanation of

the form 'I have the intention to be on time which naturally led to the thought to catch the bus. The intention was mine and so, therefore, is the thought'. While the subject is quite aware that the thought resides in his mind, he is not aware that it originated there. In effect, the subject is capable of thinking 'Someone has produced the thought "Catch the bus!"', but not 'I am that someone'. There is an awareness that a thought has been produced, as well as an awareness of the content of the thought, but no awareness of one's own role as its producer. (Gold and Hohwy 2000, pp. 153-154)

Gold and Hohwy argue that egocentricity is not equivalent to either procedural rationality or content rationality. It is, in their view, a key element in a *sui generis* form of rationality that they term *experiential rationality*.

An initial sense of unease with this proposal emerges when one considers that the proposed form of rationality does not involve anything recognisable as reasoning. It does not involve any transitions between thoughts that can be judged as valid or invalid, well-grounded or ungrounded. In the quoted passage they suggest that a breakdown of egocentricity manifests itself in a subject *failing* to make a particular sort of inference about the aetiology of their occurrent thought that they must catch the bus. This cannot be their considered opinion. However, it is as clear as anything is that no normal subjects ever make inferences about the aetiology of their current thoughts - and certainly not as a condition of their being rational. It may well be the case that experienced thought insertion results from the breakdown of processes whose proper functioning generates what is often termed a *feeling of ownership* with respect to one's own thoughts, but it is unacceptable to think that this feeling is produced by anything like an inference (Frith himself is often guilty of this confusion). This presumably is why Gold and Hohwy switch to talking about experiential rationality and to identifying the source of thought insertion and related delusions in the alien quality of the experience of schizophrenic subjects (in the content of their experience, which is why I earlier described their proposal as a form of the content irrationality proposal). But then one wonders why this should be taken to fall within the domain of rationality at all. In what sense is it properly described as *irrational* to have one form of experience rather than another?

In fact, it seems that we are being offered a version of Brendan Maher's thesis that delusions are the product of normal reasoning processes applied to abnormal experiences. We have already seen how Gold and Hohwy explain the abnormal experiences in terms of a breakdown of self-monitoring. Here is what they have to say about the reasoning processes of the delusional schizophrenic:

Delusion can be seen as a sensible cognitive response. To refrain from explanation [of the abnormal experiences] is psychologically impossible, and the other options, such as hypothesising that one is mentally ill, may require giving up beliefs that are more important to the agent - such as the belief that he *is* an agent; that he has some grip on the nature of his experience; or that he can affect his environment. Thought insertion, however bizarre, may be among the more adaptive hypotheses one could adopt. This

seems particularly true if one supposes that delusional experience is pervasive in schizophrenia and that more 'rational' hypotheses than thought insertion would require dismissing the veridicality and relevance of one's experience. (Gold and Hohwy 2000, p.163)

There are two points to make here. The first is that, as emerged when we discussed Maher's views in section 3, the real problem is not with the experienced properties of the thoughts but with the conclusions that are drawn from them. This puts us squarely in the domain of epistemic rationality/irrationality. Secondly, the considerations that Gold and Hohwy adduce may indeed show that delusion is a sensible cognitive response, but this does not in any sense show that the only irrationality in schizophrenic delusion is experiential irrationality (granting for the moment that this actually is a form of irrationality) and that schizophrenic delusions are epistemically rational.¹⁴ There is a confusion here between epistemic rationality and what I prefer to term *inclusive rationality*. The pragmatic considerations they bring in (such as the subjective cost of abandoning certain beliefs and the adaptiveness of the thought insertion hypothesis) are completely irrelevant to discussions both of procedural rationality and epistemic rationality (both understood in my sense). There may well be, as I will tentatively suggest in section 6, an overarching sense of rationality (inclusive rationality) on which certain courses of action can count as rational despite being epistemically irrational (just as certain types of reasoning can count as epistemically rational despite being procedurally irrational). But this is not at all what Gold and Hohwy are suggesting.

Turning now to the third of the three competing accounts I will be considering, the explanatory framework developed by Stone and Young (1997) to explain the genesis of the Capgras delusion could be developed into a more general account of delusions, and *a fortiori* into an account of schizophrenic delusion. Although Stone and Young do not themselves propose extending their account in this way, the proposal is made by Davies and Coltheart (2000). The Stone-Young explanation of the Capgras delusion is in some ways similar to Maher's general theory of delusional belief. Like Maher, Stone and Young stress the significance of abnormal perceptual experiences in generating the delusion that a loved one has been replaced by an impostor. On their view (following Ellis and Young 1990) the anomalous perceptual experience consists in a familiar face being seen without the characteristic affective response it evokes. This occurs as a result of damage to the occipito-temporal and/or temporo-parietal regions of the right hemisphere. The feeling of strangeness will obviously be exacerbated by the degree of attachment felt by the patient to the owner of the face, which is why the patient's spouse is usually the object of the delusion. Unlike Maher, however, Stone and Young do not think that the reasoning processes of the patient are unimpaired. The Capgras delusion only emerges (and persists) because Capgras patients are in the grip of systematic reasoning biases. They draw attention to certain of the aspects of delusional

¹⁴ Although they do not employ the terminology of epistemic rationality, it is clear that they are committed to holding that schizophrenic delusions are epistemically rational, since what I am terming epistemic rationality is

reasoning brought out in the studies discussed in the previous section (although without paying attention to the fact that these studies were not carried out in patients suffering from Capgras delusion) and conclude in the following way:

These differences between people with and without delusions are found in inductive reasoning tasks; deductive reasoning has been less thoroughly investigated, but available studies have not shown differences. For example, Maher (1992) reviews evidence indicating that people with paranoid schizophrenia perform logical reasoning tasks such as syllogisms as well (actually, as badly) as normal people. This fits the point we have emphasised here, that people with delusions need not be considered to be pervasively irrational or illogical. (Stone and Young 1997, pp. 342-343)

However, the distinction Stone and Young stress between inductive and deductive reasoning is cruder and less accurate than the distinction between procedural and epistemic rationality. It is wrong to say, as Stone and Young seem to be saying, that delusional subjects are impaired at the level of inductive reasoning. The general category of inductive reasoning, which I presume they equate to non-deductive reasoning, is too coarse-grained. As we saw in the previous section, delusional patients are reasonably secure on the procedural aspects of non-deductive reasoning. Their difficulties are at the level of epistemic rationality.

Stone and Young ascribe the reasoning problems of delusional patients to what they call reasoning biases. Many of these (like their propensity to reach conclusions on the basis of evidence insufficient to convince normal subjects) are simple failings in epistemic rationality. But others seem initially not to fit into the schema I have outlined. They draw attention, for example, to the so-called attributional bias of patients with persecutory delusions who are known to tend to blame negative events on external rather than internal causes, essentially transferring responsibility for things that go wrong from themselves to others. There is no doubt that this sort of behaviour is extremely common among patients suffering from paranoid delusions.¹⁵ But describing it in terms of the functioning of an attributional bias does not seem the most informative way of characterising it. In fact, it seems pretty pleonastic – although this is a criticism of Bentall, the originator of the analysis, rather than of Stone and Young themselves. If possessing an attributional bias just is having the tendency to find external causes for negative outcomes, then we learn nothing about the genesis of the behaviour by being told that patients with paranoid delusions find external causes for negative outcomes because they reason with an attributional bias. What would be

subsumed within what they term procedural rationality and they hold that delusional patients are procedurally rational.

¹⁵ Some caution needs to be exercised, though, in applying the account to delusions of misidentification. One might think, for example, that the patient with Cotard delusion who deludedly believes that he himself is dead is a prime example of someone in the grip of an attributional bias – by making himself the locus of all the problems. And one might think that the patient with Capgras delusion who thinks that his wife has been replaced by an impostor exemplifies an attributional bias in the opposite direction. But the fact that Cotard and Capgras delusions can occur concurrently in a single patient renders these explanations in terms of attributional biases rather problematic.

genuinely informative, however, would be an exploration of the particular impairments in evidence-gathering and hypothesis-testing (that is to say, in the central areas of epistemic rationality) that generate this type of biased reasoning. Here too, as with the explanation of delusions in terms of content irrationality, we find that the framework proposed earlier in this paper provides a more satisfying and less misleading way of making the basic point.

Stone and Young do go some way towards this in the second half of their paper when they address the question of why delusional patients do not revise their beliefs. They suggest that belief revision in normal subjects is driven by a perceived need to balance two requirements. The first requirement (which they call the principle of conservatism) is to minimise the drasticness of changes to the belief system, while the second (the principle of observational adequacy) is to revise one's beliefs in line with one's perceptual experience of the world. In delusional subjects, on the other hand, the principle of observational adequacy massively outweighs the principle of conservatism. Here we do seem to be in the realm of epistemic rationality, since these are both higher-order constraints upon belief maintenance/revision. Nonetheless, Stone and Young's particular formulation of the problem leaves open as many questions as it answers. It is too coarse-grained to say simply that the processes of belief revision in normal subjects over-compensate for observational adequacy to the detriment of conservatism. Such a description really adds little to what we already know – namely, that abnormal perceptual experiences precipitate a drastic revision of the belief system in delusional patients because taking their abnormal perceptual experiences at face value leads such patients to entertain and adopt massively implausible hypotheses. But what we really need to know is the details of the mechanisms by which such states of affairs come about. Clearly something has gone wrong. But it is uninformative to be told merely that observational adequacy has trumped conservatism. We need a better grasp of the particular norms that have been breached and of the particular principles that have been – or, in other words, we need a more detailed understanding of what has gone wrong at the level of epistemic rationality. We need to know not just that there is a bias in favour of observational adequacy – but what exactly that bias consists in.

5. Generalising the Thesis: Two Potential Problems

The evidence from delusional patients, particularly those suffering from schizophrenia, seems broadly in favour of understanding delusions, at least in part, in terms of disordered epistemic rationality. A natural question to ask is how widely this thesis can be generalised. How plausible is it that (as tentatively suggested in section 2) all, or even most, of the central psychiatric disorders can be understood in terms of disordered epistemic rationality? A full discussion is beyond the scope of the current paper, but in this section I will discuss two potential problems for any generalisation of the thesis.

The first potential problem comes from the thesis of *depressive realism*, according to which depressive patients are in fact more, rather than less, epistemically rational than normal subjects. If the notion of depressive realism is well-founded then at least one important class of psychiatric patients cannot possibly be described as impaired in epistemic rationality. Second, there is considerable and well-known experimental evidence that has been interpreted as suggesting that normal subjects are themselves a long way short of epistemic rationality. One might wonder, then, whether it is possible to draw a firm enough line between the level of epistemic rationality of normal subjects and that of psychiatric patients.

Let us start with depressive realism. The thesis of depressive realism, which has impressed some philosophers (Graham 1990), emerged from various studies that appear to show that people suffering from clinical depression are more accurate and less biased in describing themselves or their situation than normal subjects. Supporters of the thesis have proposed, therefore, that depressives see themselves and the world in a clearer light than normal subjects. They are less biased in weighing up evidence and assessing probabilities, and consequently more epistemically rational. This is not the place for a full evaluation of the thesis of depressive realism, but a few remarks are in order. It is far from clear that the thesis of depressive realism is the correct conclusion to draw from the experiments that are often cited in its support. One example will make the point. In one set of experiments (Golin, Terrell and Johnson 1977) subjects were asked to bet on the outcome of throwing a set of dice. In the 'control' setting the subjects were told that they themselves would be throwing the dice after making their bets. In the 'croupier control' setting they were told that a croupier would throw the dice. In both settings the subjects were asked to assess their confidence in their bets. Non-depressive subjects were far more confident in the control setting, clearly under the misapprehension that they were more likely to win when they were actively participating in the game. Depressive subjects, however, showed the converse effect. The greater the illusion of control the less optimistic they were about their chances.

The conclusion usually drawn from these experiments is that the depressive subjects are much more accurate at evaluating probabilities than normal subjects, and consequently, in the terms we have been using, much more epistemically rational. Such a conclusion seems completely unwarranted, however. The 'correct' answer is surely that the probabilities of winning are exactly the same whether one throws the dice oneself or not. Since the depressive subjects clearly fail to give this answer they can hardly be described as any freer from cognitive bias than the normal subjects. Of course, this hardly refutes the overall thesis of depressive realism, but it does strongly suggest that a closer look be taken at its alleged experimental support.

Claims structurally similar to those of the depressive realism hypothesis have been made by Maher with respect to research on probabilistic reasoning in deluded subjects (Maher 1992). Experiments by Huq et al (1988) showed that deluded subjects were significantly quicker to "jump to conclusions" than either mixed psychiatric controls or non-clinical controls. Subjects were

presented with two opaque containers each containing beads of two colours. The proportions of beads of one colour to beads of another varied across the containers according to a constant ratio. So, for example, if container A contained 85% red beads and 15% green beads then the second container would include 85% green beads and 15% red beads. The subjects were allowed to draw beads until they came to a judgement about which container the beads had been drawn from. . These experiments are usually interpreted as showing that deluded subjects suffer from a probabilistic reasoning bias. Maher suggests however that the deluded subjects are in fact operating more closely to the Bayesian norms than the control subjects (who were notably more cautious). The mean number of draws before coming to a decision in the deluded group was 2.2. Maher suggests that, since the objective probability that once two beads of one colour have been selected the third will be of the same colour is 97%, the deluded subjects were in fact making their decision at the appropriate moment. As in the case of depressive realism, however, the results are far from unequivocal. For one thing, as Garety and Freeman (1999) point out, focusing on the mean draw rate gives a misleading impression of the performance of individual deluded subjects, over half of whom reached a decision on the basis of a single bead – an incautious strategy by anyone’s standards. Secondly, even if we do take the mean as the significant statistic, a draw rate of 2 is only “rational”, even in Bayesian terms, if the first two beads are the same colour. It would be highly imprudent if the first two beads are different colours. Again, as in the depressive realism case, no wide conclusions can be drawn – except that the studies usually taken to indicate the Bayesian rationality of deluded subjects need to be studied very closely.

The discussion of depressive realism and “deluded rationality” leads naturally into the second misgiving, since the response to the first misgiving was effectively that the depressive subjects were no less under a cognitive illusion than the normal subjects. Once this has been granted it is natural to go on to ask whether psychiatric subjects are any *more* impaired in epistemic rationality than normal subjects. It is well-known from the reasoning literature that normal subjects not only have problems with taking due account of prior probabilities but also exhibit a confirmatory bias, focusing on confirmatory evidence to the exclusion of countervailing evidence (Baron 1980). Various explanations have been proposed of these apparent breakdowns in epistemic rationality, and it is sometimes denied that they really are such (Evans and Over 1996). One might wonder, then, whether psychiatric breakdowns in epistemic rationality are really all that different from everyday breakdowns in epistemic rationality? Frith has voiced a version of this worry:

There is a major problem with the notion that delusions reflect the faulty application of logic. Ample research on normal people (e.g. Johnson-Laird 1982) has shown that the faultless application of logic is not a common feature of human thinking. Most problems are solved on the basis of knowledge drawn from experience rather than reasoning. In circumstances where logic and reasoning have to be used, even those with special training may fare very badly. On this basis we might even argue that what is

wrong with many schizophrenic patients is that they are trying to apply logic in circumstances where normal people would not. (1992, pp. 79-80)

As this passage makes clear, there are two distinct concerns that might be voiced in this general area. The first is whether there are significant differences between delusional patients and normal subjects, while the second is whether most thinking, both that undertaken by delusional patients and normal subjects, really falls within the domain of rationality at all.

As far as the first worry is concerned, we should not, I think, overstress the parallels between the reasoning processes of delusional patients and those of normal subjects. It seems clear that many of the sorts of arguments that have been offered to rationalise poor performance on standard tests of epistemic rationality cannot be extended to apparent delusional breakdowns of epistemic rationality. Many such explanations proceed by trying to show that experimental subjects who are apparently failing to follow the dictates of epistemic rationality can be reinterpreted as successfully following a procedure that pursues a different, but nonetheless epistemic, goal. So, for example, in the 'rational analysis' approach to the apparent confirmatory bias in the selection task, we find an argument that the choice behaviour that seems to display a confirmatory bias is really best interpreted as an attempt to satisfy the epistemic goal of reducing uncertainty, where uncertainty is calculated in information-theoretic terms (Oaksford and Chater 1994). The point here is that a norm of procedural rationality, namely that rational subjects should abide by the basic principles of conditional reasoning such as *modus ponens* and *modus tollens*, can be trumped by an overarching norm of epistemic rationality, namely, that rational decision-making and belief revision requires as little uncertainty as possible. Yet the contrast with the psychotic's breach of the norms of procedural rationality should be clear. The attitude of the psychotic towards the evidential basis for delusional beliefs can hardly be described as driven by epistemic goals.

The second worry stems, I think, from the (by now familiar) neglect of the distinction between procedural and epistemic rationality. It is certainly true that many of the paradigms employed to test procedural rationality (such as the Wason selection task and the many experiments in which subjects are asked to perform complicated calculations about the ratios of different coloured balls in an urn) are very artificial, and it is unlikely that these paradigms tap directly into commonly employed reasoning practices. But it is absurd to conclude that, because subjects regularly endorse fallacies of conditional or probabilistic reasoning, they are not engaged in reasoning. It is true that practical reasoning and everyday theoretical deliberation rarely involve the explicit application of the principles of deductive logic or the probability calculus (and that this is probably why they tend not to perform very well on the standard tests of "rationality"). But that is because much everyday reasoning and theoretical deliberations falls within the scope, and is subject to the norms of, epistemic rationality – rather than of procedural rationality.

6. Inclusive Rationality?

This brings us to the final question that I want to raise. I have so far discussed two different types of rationality – procedural rationality and epistemic rationality. There is a sense in which an apparent breakdown in procedural rationality can nonetheless be epistemically rational. Or so at least it is argued by many psychologists who study the Wason selection task and other apparent breakdowns of procedural rationality. But then the obvious question to ask is the following. Is there a perspective from which non-epistemically driven psychiatric breakdowns in epistemic rationality can nonetheless properly be described as rational? Is there an overarching perspective, a perspective of *inclusive rationality*, from which considerations of epistemic rationality can be trumped by pragmatic considerations?

There is certainly a difference between being rational and being rationalisable. It is one thing to say that obsessive-compulsive rituals are persisted in because they produce a feeling of control. Quite another to say that the feeling of control bestowed by obsessive-compulsive rituals makes them rational responses to the situation in which the obsessive finds him or herself. Yet there is a certain plausibility in the stronger claim. Many psychiatric symptoms can be interpreted as being driven by the goal of maintaining a limited degree of mental stability in the face of wildly dissonant and disruptive data – which is not, of course, the same as being driven by the (epistemic) goal of making sense of wildly dissonant and disruptive data. Some of the negative features of schizophrenia provide a case in point.¹⁶ Normal subjects employ a variety of defence mechanisms against information overload and parallels have been proposed with certain clinical aspects of schizophrenia (Miller 1960, Hemsley 1977):

Normal subjects

Temporary non-processing of information
 Failing to make adjustments to error
 Approximation¹⁷
 Delaying responses during peak load periods
 Escape

Schizophrenics

Poverty of affect, under-responsiveness
 Incoherence of speech
 Undifferentiated responding
 Retardation
 Social withdrawal

¹⁶ In section 4 I tentatively suggested that the negative symptoms of schizophrenia, particularly in chronic patients no longer displaying positive symptoms, could be understood at least in part as involving impairments in procedural rationality. Here I am treating them as epistemically irrational. Is there a tension? No, because the claim was never that chronic schizophrenics are procedurally irrational but epistemically rational.

¹⁷ A process whereby a number of distinct stimuli that would be treated differently by normal subjects all receive the same response.

It might be suggested that the defence mechanisms of schizophrenics are no less rational than the defence mechanisms of normal subjects. They are certainly more drastic, but then so too is the disruption and dissonance with which they are trying to cope. A similar analysis is plausible for the compulsive rituals of the obsessive¹⁸ - or the denial and confabulation of the anosognosic. These are all cases in which the over-riding goal of preserving some, albeit very limited, degree of cognitive equilibrium trumps the goals of epistemic rationality.

For this line of argument to go through, rationality must be understood as a goal-oriented notion, so that an action or pattern of behaviour will come out as rational to the extent that it effectively satisfies the most salient goals in a particular context.¹⁹ But the notion of a goal being effectively satisfied can be interpreted in one of two ways. We can take it externally or internally. On the internal construal, for an action to count as rational in virtue of satisfying a goal it must have been intended by the agent to satisfy the goal in question. In contrast, on the external construal all that has to be the case is that the agent possess the goal in question and that the action in fact satisfy that goal. Now, it is natural to think that the rationality in this case cannot be internal. It seems wrong to say that the negative symptoms of schizophrenia are *intentional* coping strategies (except, of course, in a highly etiolated sense of “intentional”). And many would take this as a conclusive reason against the proposal that non-epistemically driven psychiatric breakdowns in epistemic rationality can nonetheless properly be described as rational. But if we expand our conception of rationality to admit the external construal of goal satisfaction (so that assessments of rationality are relative to the *de facto* satisfaction of goals that may or may not be epistemic) then the way becomes clear for allowing an inclusive sense of rationality on which the actions and beliefs of a psychiatric patient can count as rational, even though they are neither procedurally nor epistemically rational. This will give us a tool not simply for classifying and understanding psychiatric disorders, but also for therapy. There is no point trying to alleviate those psychiatric symptoms that can be classified as rational in this inclusive sense unless some substitute is found that will perform the same function that those symptoms were performing.

Putting this final therapeutic suggestion to one side, however, what I have tried to show in this paper is, first, that the notion of rationality is indispensable for understanding delusional psychiatric disorders and, second, that we need to distinguish clearly between procedural rationality and epistemic rationality in thinking about the reasoning processes of delusional patients. There is no univocal sense in which psychiatric patients, and delusional patients in particular, can be described as rational or irrational. They can be epistemically irrational but procedurally rational (as I have suggested seems to be the case with acute schizophrenics whose symptoms are largely positive). Or they can be epistemically irrational but procedurally rational (as seems to be the case, for example, with patients suffering from various types of paranoid delusion. When considerations of inclusive

¹⁸ This would be denied by those who hold obsessive-compulsive disorder to have a purely organic aetiology. Rapoport (1990) has argued, for example, that OCD results from damage to the basal ganglia.

rationality enter the picture things become more complex still. Chronic schizophrenics may be inclusively rational, despite being both procedurally and epistemically irrational. The thought I would like to end with, however, is the following. Thinking about the interplay between rationality and irrationality in psychiatric patients forces to re-examine many of the things that we take for granted about everyday rationality. The notion of rationality is complex and multi-layered. It is not simply that we need to distinguish between procedural rationality and epistemic rationality. We also need to take seriously the possibility that the everyday notion of rationality is broader than many philosophers have been prepared to accept – that we should accept an overarching conception of rationality in terms of the *de facto* satisfaction of goals that may or may not be epistemic.

Department of Philosophy

University of Stirling

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¹⁹ Foley 1993 provides a sophisticated philosophical treatment of this idea.

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