

The phenomenological correlates of acting on delusions

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Declaration

This thesis has been composed by me. The work on which it is based is my own and the thesis has not been submitted in candidature for any other degree, diploma or professional qualification.

Signed:

Date:

Acknowledgements

Data collection for the present study took place during the development of the Maudsley Assessment of Delusions Schedule (M.A.D.S.). Details of the M.A.D.S. and of its development have been published (Wessely *et al*, 1993; Taylor *et al*, 1994). The instrument was developed in the Department of Forensic Psychiatry at the Institute of Psychiatry by a team led by Dr. Pamela Taylor. The project was funded by the John D. and Catherine T. MacArthur foundation. In addition to the present author the other members of the team were John Cutting, Graham Dunn, Philippa Garety, Don Grubin, Alison Reed and Simon Wessely. Data collection was undertaken by Buchanan, Reed and Wessely. The literature review and some of the results reported here have been published (Buchanan, 1993; Buchanan *et al*, 1993). The papers are included as Appendix 5.

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Published papers

1 The Problem

1.1 Introduction

When do psychotic patients act on their delusions? Eugen Bleuler thought that the question was unlikely to arise. Psychotic subjects acted only rarely in accordance with their abnormal beliefs:

"They really do nothing to attain their goal; the emperor and the pope help to manure the fields; the queen of heaven irons the patients' shirts or besmears herself and the table with saliva" (Bleuler (1924), p. 392).

Bleuler's contemporaries shared his view (Kant, 1927; Jaspers, 1963). Since then those writers who have not ignored the issue have argued similarly that delusional action is uncommon (Anderson & Trethowan, 1973; Hamilton, 1985; Merskey, 1980; Slater & Roth, 1969).

There have, however, been hints to the contrary. In a study of pre-trial prisoners Taylor (1985) found that one fifth of psychotic subjects were driven to offend by their symptoms and described an association between delusions and violent acts. Gibbens' (1958) review of 115 cases of homicide

admitted to New Jersey State Hospital described one third of insane murderers as having "well structured" delusional motives for their crimes. And Lanzkron (1963) reported that 40% of insane homicides occurred, "as offspring of a delusional system". Despite the high rates of acting on delusions suggested by these studies, it is difficult to know to what extent one can generalise from the results. Prisoners are an atypical group.

Recently, however, it has been suggested that delusional action is a common phenomenon in general psychiatry. Wessely *et al* (1993) found that 60% of deluded patients reported acting on one of their delusions and that 20% of patients had acted on their delusions three times or more. Similar frequencies obtained whether delusional action was rated by other people or by the patient himself. Self-reported delusional action was associated with delusions of catastrophe and when delusional action was defined on the basis of information provided by informants persecutory delusions were more likely to be acted upon than were other categories of abnormal belief.

The purpose of the present research is to describe the phenomenological correlates of delusional action. There are several reasons to do this. Firstly, when the action is violent, it may benefit risk assessment. Secondly, it may benefit the investigation of other elements of psychotic

phenomenology. One such element is insight; delusionally based actions may test the veracity of the delusion and lead to an awareness that it is a symptom of illness. Finally, it will benefit the study of the nature of delusions.

Authoritative definitions of delusions describe them as false beliefs, held with conviction and regarded by the subject as self-evident, which are not amenable to reason and inherently unlikely in content (Kraupl Taylor, 1983; Mullen, 1979). It is easy to identify exceptions, however, and the extent to which individual delusions display each of these qualities varies (Kendler et al, 1983; Mullen, 1979; Garety and Hemsley, 1987). Perhaps as a result, some authors have attempted to identify different characteristics which distinguish delusions from normal beliefs; one suggestion is that delusions represent "defective reasons for action" (Fulford, 1989). Central to this debate is the degree to which delusions are acted upon and the way in which this occurs.

This chapter has three purposes. The first is to describe some theoretical aspects of the study of delusional action. The second is to review the literature relating to acting on delusions. Most of this literature is anecdotal, allowing no estimate of rates or frequencies. In these circumstances an attempt will be made to illustrate the nature of the link between delusion and action by providing as full a phenomenological description as the literature allows. The

third purpose of the chapter is to review the limited literature concerning other aspects of psychotic phenomenology which are associated with acting on delusions.

1.2 Theoretical aspects of belief and behaviour

A review of the link between abnormal belief and behaviour demands some discussion of the role of normal beliefs in the genesis of action. In the nineteen forties and nineteen fifties behaviourists such as Hull (1943) and Guthrie (1952) opposed the then widespread notion that action must be explained in terms of purpose. They argued that human behaviour could be better explained in terms of "receptor impulses" and "movements". The elucidation of these "primary principles" would then, in turn, allow a rigorous definition of terms such as "purpose" and "intention". In the words of Hull,

"The present approach does not deny the motor reality of purposive acts (as opposed to movements), of intelligence, of insight, of goals, of intents, of stirrings or of value; on the contrary, we insist upon the genuineness of these forms of behaviour. We hope ultimately to show the logical right to the use of such concepts by deducting them as secondary principles from more elementary objective primary principles." (pp. 25-26).

While beliefs are clearly important if behaviour is to be explained in terms of purpose, their role is less clear when this behaviour is explained in terms of "primary principles". Hull was clear that an explanation of purposive

behaviour could be derived from postulates involving only "stimulus" and "movement".

The role of goal directed thought was similarly dismissed by Guthrie (1952) who suggested that thinking, like action, was a product of conditioning and tended to occur when action was blocked. These authors aspired to a science which was more rigorous and quantitative. As Hull wrote in 1951,

"the continuous quantitative use of relevant postulates and corollaries will hasten the elimination of errors and the day when mammalian behaviour will take its place among the recognised quantitative systematic sciences." (p.2).

But it was not the advocacy of a rigorous scientific method which concerned other authors, rather the theory which lay behind the writings of Guthrie and Hull. Keith Campbell (1970) noted that behaviourists had placed "the mind" not behind an action but in the behaviour itself and hence, worryingly for him, omitted the causal element in mental concepts. In the second half of the twentieth century philosophers' arguments have followed two related themes, both of which allow a pivotal role for belief in the explanation of action.

The first has been expanded by Papineau (1978) who argues that the reasons behind an action involve, firstly, a desire and, secondly, a belief that the action will contribute to

the satisfaction of that desire. He acknowledges that everyday explanations of action commonly invoke only a desire or a belief but argues that both are in fact required; we mention only that part of the cause which is most surprising, least generally known or most morally significant. The second theme has been described by Charles Taylor. Taylor (1964) explains behaviour in terms of Aristotelian teleology, that is, he argues that our present use of the terms "action" and "behaviour" do not allow them to be broken down into units of stimulus and response but require an explanation of behaviour in terms of its purpose. Thus he differs from Papineau in regarding behaviour as "pulled" into existence by its purpose, as opposed to "pushed" into existence by the belief and desire of its agent. Taylor's explanation of human behaviour, however, shares with that of Papineau a recognition of the importance of knowledge or beliefs. The author refers to the "Canute view" of those who reject purposive explanations of action and is graphic in his description of the logical consequences of behaviourist theory:

"The area in which we can attribute responsibility, deal out praise or blame, or mete out reward or punishment, will steadily diminish until in the limiting case, nothing will be left; the courts will be closed or become institutes of human engineering, moral discourse will be relegated to the lumber-room of history." (pp.42-43).

The emotive quality of Taylor's plea is not a new feature of the debate. In the sixteenth century the use of teleological arguments to demonstrate the existence of a deity led Francis Bacon to compare teleological explanations to vestal virgins: "They are dedicated to God, and are barren" (quoted by Papineau, 1990).

Even as they were written the views of Hull and Guthrie were not universally held. William Hunter (1930) referred to the importance of "symbolic processes" in influencing man's instinctive behaviour, invoking a model more cognitive than that allowed by some behaviourists. And in 1932 Krechevsky published his claim to have found empirical evidence that rats running mazes formed hypotheses to assist them in solving problems. In the second half of the twentieth century writers in medicine and psychology have been more prepared to entertain a cognitive view of behaviour where a subject's knowledge and beliefs assume a greater role. Austin (1956-7) described some of the elements in his "machinery of action" as consciousness, voluntariness, self-control, knowledge and foresight. Fulford (1989) developed this theme in *Moral Theory and Medical Practice*, writing, "in the case of raising my arm, what has to be specified, in addition to the state of motion of my arm, is my purpose in raising it." Psychologists such as Spence (1956) and Mowrer (1960) still draw heavily on a view of learning based on Pavlovian conditioning but Mowrer's references to subjects

"learning to be afraid" and "learning what to do" make it clear that he gives greater weight to the cognitive processes of his subjects than did his predecessors.

McGinn (1979), developing the work of Davidson (1971), divides bodily movements into active and passive. Action is based on reasons and reasons for actions are based on a combination of desires and beliefs; in McGinn's words, "desire without belief is blind, belief without desire is purposeless." He adds several qualifications to this description of action. Firstly, he argues that desires and beliefs exist in a dynamic state in the conscious mind and that interaction occurs between them; beliefs must be reckoned in the light of the pattern of desires. Secondly, he concedes that no general law of action can be derived from this framework; "what was sufficient to make me cross the road on a certain occasion will almost certainly not be repeated." Finally, he acknowledges that belief and desire are not in themselves sufficient to produce the will to act. We can desire an end, and believe that a particular course of action will produce that end, without ever getting around to doing something about it. The will to act is partly dependent on what he calls "noticings", internal or external cues which precipitate action. Someone who believes that their drinking is damaging their health, and who desires to stop, may only be precipitated into action by an event such

as being convicted of drunk driving or seeing a friend die from gastro-intestinal haemorrhage.

In the second half of the twentieth century the influence of purely behaviourist explanations of human action has diminished. Recent medical and psychological writing has focused more on the influence of belief on human action and this reflects the tenor of philosophical writing on the subject. The role of beliefs in behaviourist theory is vague and this may go some way to explaining the lack of research in the psychological literature into actions based on delusions.

1.3 Delusions implicated in action

The literature pertaining to the behavioural consequences of delusions will now be reviewed. Ideally, such a review would be informed by epidemiological data providing information as to the likelihood of a particular type of delusion being acted upon. Unfortunately, most reports in this area are anecdotal and allow no such estimate of risk. Indeed, it seems reasonable to assume that such reports as do exist concentrate disproportionately on actions which are violent or attract attention in other ways. When delusions lead people to stop doing things, the reporting of such delusions will be less common. It seems unlikely, for instance, that the progressive social isolation of some people with persecutory delusions will be described in the literature, even if that social isolation is delusionally driven.

Delusions of persecution

Reports of actions based on delusions most frequently concern persecutory delusions; often these reports focus on violence inflicted on others. On 20th January 1843 Daniel M'Naghten, apparently under the impression that he was attacking the Prime Minister, Sir Robert Peel, fired at and mortally wounded Edward Drummond who was Sir Robert's

Private Secretary. M'Naghten believed he was the victim of a conspiracy and that he was being followed by spies sent by Catholic priests with the aid of the Tories, of whom Peel was the leader. At his trial he stated,

"The Tories in my native city have compelled me to do this ... They have accused me of crimes of which I am not guilty; they do everything in their power to harass and persecute me; in fact, they wish to murder me."

(Rollin, 1977, p.92).

M'Naghten was found not guilty and the "M'Naghten Rules", which govern the use of an insanity defence in English courts, were the direct outcome of his case. In this century many authors have recorded persecutory delusions in mentally ill offenders but often make only vague reference to the motive for the crime. Bach-y-rita (1974) and Bach-y-rita and Veno (1974), examining 62 violent prisoners, found 13 who demonstrated "subtle delusional systems" and who "warranted a diagnosis of paranoid schizophrenia." Green (1981), looking at 58 male homicidal patients in Broadmoor Hospital reported that in 27 cases the act of killing "appeared to be a response" to the patients' persecutory beliefs. Shore et al (1988, 1989) examined the subsequent criminal records of mentally ill people arrested near the White House, in many cases trying to see the President. They found that amongst those with no record of violent behaviour persecutory delusions were significantly associated with future

violence. They gave no further details as to the nature of the delusions.

Other authors give fuller descriptions. Maas *et al* (1984) describe the case of a man who killed both parents claiming that they had tried to kill his children by drowning them in battery acid. Reviewing the records of ten men charged with patricide, Cravens *et al* (1985) found four cases where the father was considered by the patient to pose threats of "physical or psychological annihilation." Mawson (1985) found 14 patients with delusions of poisoning in a case note study at Broadmoor Hospital and "in all but one the symptom seemed an important antecedent factor to serious violence." In a study of 15 matricidal men Campion *et al* (1985) refer to a schizophrenic patient who killed his mother because he was convinced that she was a sadist who tortured him. Other authors have reported actions based on persecutory beliefs in association with Capgras delusions (Crane, 1976; Weinstock, 1976; Christodoulou, 1978; Romanik and Snow, 1984; Tomison and Donovan, 1988); De Pauw and Szulecka (1988) report that a patient attacked her mother believing that every time her mother put on her glasses she changed into a local woman whom she disliked intensely. Hafner and Boker (1973) found that eight percent of their sample of 263 violent schizophrenics exhibited 'paranoid feelings of malaise' and felt that these patients were especially likely to act on their delusions when they perceived an immediate

threat to their lives or when persecutory beliefs were accompanied by bodily hallucinations or delusions of bodily harm.

Persecutory delusions have also been described in cases of self harm but here again the degree to which the delusion motivates the act is often unclear. In some cases, such as that described by Mintz (1964) where a cook on board ship cooked and ate his index finger in attempt to "rise above his persecutors in the way that Christ had", it is difficult to see any logical link. In other cases, such as those of ocular self-mutilation described by Shore *et al* (1978), Shore (1979) and Yang *et al* (1981) or of auto-castration described by Mendez *et al* (1972), the link between persecutory belief and action seems vague. Blacker and Wong (1963) are more specific describing the case of a man who castrated himself believing that evil spirits were using his body to perform unnatural acts. Standage *et al* (1974) describe a case of genital self-mutilation in a female schizophrenic who believed that the men in her community were going to sexually molest her. Firesetting, eating and hospital attendance have also been claimed to be influenced by persecutory delusions. Virkkunen (1974) found that three out of 30 cases of arson committed by schizophrenics represented an attempt to escape persecutors. In 1911 Bleuler had described the case of a woman refusing to drink milk because she believed it was poisoned and Lyketsos *et al*

(1985) have described cases where the eating habits of chronic schizophrenics have been influenced by similar fears. Hutchesson and Volans (1989) have described patients whose persecutory delusions led them to attend hospitals with unsubstantiated complaints of being poisoned.

Delusions of infidelity and grandiose delusions

The propensity of delusions of infidelity to be acted upon in a manner dangerous to others has been described by Shepherd (1961) and Mowat (1966). Gillies (1965) described the case of a schizophrenic who murdered his wife, telling his psychiatrist, "a mysterious power told me she was being unfaithful." More recently, Hafner and Boker (1973) noted delusions of love and infidelity in 11.2% of their sample of violent schizophrenics as against 1.4% of non-violent schizophrenic controls. Of the 14 patients at Broadmoor with delusions of poisoning described by Mawson (1985), six also had delusions of infidelity.

Actions based upon grandiose delusions were described in 1823 by John Haslam. Shortly after the New Bethlem Hospital was built in St George's Fields in London Haslam described the case of Thomas Lloyd whose confidence in his madrigal and linguistic abilities led him to dance and sing in public and address foreign visitors in miserable French. In the

presence of a hypomanic affect, however, it becomes debatable whether such phenomena should be attributed to the mood state or to the delusion. Kraines (1957) wrote that,

"the manic patient who says that he is the son of God is not expressing a delusion of symbolic significance as would be true in schizophrenic thinking, but has merely left unsaid the feelings that he is superior, that he is capable of undertaking any enterprise, that he is superior enough to be as powerful as the poetic concept of 'Son of God'." (p.280-281).

Should such a patient attempt to walk on water it is not clear whether this would occur as a consequence of his belief or his mood. This point will be returned to in the discussion of drive, motivation and affect.

Delusions of passivity, ill health or bodily change

The influence of delusions of passivity on behaviour was alluded to by Tomison and Donovan (1988) in their description of a 23 year old man who attacked two others with a Stanley knife but no details were given. Two studies of matricidal men (Campion *et al*, 1985; Green, 1981) have also described delusions of passivity in association with acts of violence but command hallucinations were also present and it is not clear to which element of phenomenology the act can best be attributed, if indeed it

can be attributed to either. Planansky and Johnston (1977) are more explicit. Looking at 59 male schizophrenics who had attacked others or made verbal threats to kill, they identified nine cases where the subject "had to attack against their will, as if directed by others or by an impersonal force". Delusions of passivity have also been described in cases of self-mutilation (Rosen and Hoffman, 1972; Sweeney and Zamecnik 1981); Shore *et al* (1978) describe the case of a man who enucleated both of his eyes believing that "a force" had overpowered him and had taken control of his actions.

Delusions of ill health or bodily change have been described by Green (1981) in matricidal men and by d'Orban and O'Connor (1989) in women who kill their parents. Jones (1965) studied 13 chronic schizophrenic patients with stereotypies. One of his cases touched his car repeatedly, explaining that it controlled the pumping of his blood. Hafner and Boker (1973) considered that delusions of bodily harm, when linked with persecutory delusions, were associated with violence in schizophrenics. Delusions of bodily change leading to self harm were described in 1928 by Lewis while Beilin (1953) reported the case of a Polish labourer who amputated his penis claiming that there had been a change in his body contour and that he was assuming the form of a woman. Sweeney and Zamecnik (1981), reviewing predictors of self-mutilation in patients with

schizophrenia, described instances of patients acting on beliefs that their blood needed to be cleansed or that a limb required surgical investigation.

De Clerambault's syndrome and Capgras; delusions of guilt

De Clerambault (1942), quoted by Goldstein (1987), included a description of a man who repeatedly struck his ex-wife in public in his original description of the eponymous syndrome. Goldstein reviewed seven cases of erotomania and found that all had acted on their delusions, several to the extent of making physical assaults. Enoch *et al* (1967) and Taylor *et al* (1983) both emphasised the possibility of physical assaults consequent upon the imagined infatuation but a recent review referring to the "spectre of dangerousness" in de Clerambault's syndrome has concluded that "the evidence that it usually represents anything more than an apparition remains unconvincing" (Bowden, 1990). Capgras syndrome has been linked with violent behaviour in several case reports (Weinstock, 1976; Crane, 1976; Christodoulou, 1978; Shubsacks and Young, 1988; De Pauw and Szulecka, 1988; Tomison and Donovan, 1988; Silva *et al* 1989); Romanik and Snow (1984) described the case of a 57 year old woman who pointed a loaded gun at two meter readers believing that one of them was a homosexual who had been impersonating her by wearing a mask since he was eight. He

had acted like a prostitute and sullied her reputation. Fishbain (1987) attempted to quantify the frequency of Capgras delusions but his paper highlights the methodological problem that Capgras delusions are usually reported only when attention is drawn to them by violent behaviour.

Reports of delusions of guilt associated with behaviour usually involve self harm. Numerous examples exist in the literature of such an association in depression (e.g. Albert *et al*, 1965) and even mania (Hartmann, 1925) and in depression the frequency of suicide attempts has been shown to correlate with the presence of delusions (Miller and Chabrier, 1988). In schizophrenia, MacLean and Robertson (1976) described the case of a man who enucleated his own eye when preoccupied with his "sins". Numerous reports exist of self-inflicted eye injuries (Westmeyer and Serpass, 1972; Shore *et al*, 1978; Crowder *et al*, 1979) and genital self-mutilation (Beilin and Gruenberg, 1948; Greilsheimer and Groves, 1979; Waugh, 1986) in the presence of delusions of guilt which do not appear to be mood congruent.

Religious and sexual delusions

Delusions with religious or sexual themes are common in psychiatry and similar themes are evident amongst those

delusions which are acted upon. Witherspoon *et al* (1989), reviewing the literature on self-inflicted eye injuries, found that 34 out of 85 patients gave religious reasons for their action. Often these were associated with delusions of guilt. Waugh (1986) describes a schizophrenic man who severed his testicles with a razor blade stating that he felt evil and that self-castration was the only way to gain forgiveness. In other cases religious beliefs in themselves seem to have motivated an act of self harm. Kushner (1967) quotes a schizophrenic who was "sure that he had castrated himself in search of purification and not because of feelings of guilt". In many cases the religious motivation is described in very general terms (Gorin, 1964; Anaclerio and Wicker, 1970; Tapper *et al*, 1979; Crowder *et al*, 1979; Sweeney and Zamecnik, 1981); Tenzer and Orozco (1970) describe the case of a woman who removed her own tongue after receiving a message from God that "duty demanded it".

In other cases the motivation seems more specific. The series of cases of filicide reported by Resnick (1960) includes that of a psychotic woman who threw her baby out of the window in the belief that this was what the Lord wished. Shore (1979) describes a patient who was found with a pencil lodged in his right eye who quoted Mathew 5 : 29, "And if they right eye offend thee, pluck it out, and cast it from thee, for it is profitable for thee that one of thy members should perish, and not that thy whole body should be cast

into hell." This concrete interpretation of a biblical passage might be described, not as an example of delusional motivation, but as retrospective justification. That Shore's patient was delusionally motivated, however, is further suggested by his later explanation that he had, "misconstrued the spiritual meanings." Waugh (1986) describes a man who castrated himself in response to Mathew 19 : 12, "There are eunuches made so by men and there are eunuches who have made themselves that way for the sake of the Kingdom of Heaven," while Greilsheimer and Groves (1979) describe a case of genital self-mutilation invoking a similar passage at Mathew 18 : 7-9. A religious component is frequently present in delusionally based acts which harm others (Maas *et al* 1984); Campion *et al* (1985) report the case of a 23 year old man who killed his mother believing she was the devil. Sexual ideation was present in the motivation of 21 out of 85 cases of ocular self-mutilation reviewed by Witherspoon *et al* (1989). Frequently associated with guilt in such cases (e.g. MacLean and Robertson, 1976; Crowder *et al*, 1979), such ideation may also be implicated when the harm is directed at others. Cravens *et al* (1985) described homosexual delusions focused on the father in three out of their ten cases of patricide.

1.4. Other psychotic phenomena affecting action

The previous section described cases where a delusion apparently contributed to a psychotic individual's behaviour. In many of these cases, however, the belief in question was held for a considerable period before being acted upon. And many patients hold similar beliefs without doing anything about them. The mere presence of a delusion is insufficient to generate action. As described in the discussion of theoretical considerations, McGinn (1979) has argued that, in addition to a belief itself, "desire" and "noticings" are required to explain behaviour. Is it possible to find equivalents for these terms in psychiatric phenomenology and hence use McGinn's model as a framework to investigate delusional action? This section will consider those elements of psychosis which might be expected to affect the likelihood of a belief influencing a patient's behaviour.

Perceptual changes

Foremost amongst these elements may be the perceptual changes associated with schizophrenia. These will be examined with regard to two areas, namely, the perception of form and the perception of emotion. Cutting (1985) considers

that although basic visual processes are probably normal in schizophrenia a deficit exists in the appreciation of visual form. He quotes Levin and Benton (1977) who demonstrated that chronic schizophrenics were worse than neurotics in their ability to recognise faces. Auditory perception may also be affected and, reviewing other modes of perception, Cutting concludes that there is evidence for a disorder of body image perception in some patients (Weckowicz and Sommer, 1960; Cleveland *et al*, 1962). Examples given by the authors make clear the threatening nature of these perceptual changes: Weckowicz and Sommer quote the case of a man who, when he looked in the mirror, saw his eyes completely out of their sockets. Several writers have commented on the propensity of perceived threat to lead to violent action in psychosis (e.g. Mullen, 1988).

Perception of emotion has been found by several authors to be abnormal in schizophrenia. Dougherty *et al* (1974) showed photographs of facial expressions to schizophrenic and control subjects and found that schizophrenics were significantly worse at identifying the emotion shown. Iscoe and Veldman (1963) found that schizophrenics did worse than controls when asked to arrange nine drawings in order from "happy" to "sad" and argued that they had difficulty in perceiving "subtle emotional graduations". Spiegel *et al* (1962) found schizophrenics "normally sensitive to the nuances of facial expression" but found that, while they

were able to arrange facial expressions in order from angry to happy, they were unable to derive the criteria they were using. Similar findings have been described with reference to emotion in speech. Turner (1964) tested the ability of 60 schizophrenics and 30 controls to identify the emotional flavour of a taped nonsense sentence and found that the performance of schizophrenics was impaired. Studying 24 acute schizophrenics Jonsson and Sjostedt (1973) found that they did worse than controls when asked to identify the emotional intonation of spoken single words. Perceptual changes such as these may correspond to the "noticings" described by McGinn (1979) as triggers for action based on belief. The abnormal sensitivity of schizophrenics to certain emotional themes (Brodsky, 1963; Cutting, 1985) may also affect the likelihood of their acting on their delusions. Finally it is possible that the decreased empathic ability of schizophrenics described by Milgram (1960) allows them to act in ways which cause harm to others.

The importance of these perceptual changes has been alluded to by several authors. MacLean and Robertson (1976) considered that a perception that an alarming change was occurring in one's body contributed to self-mutilation in psychotic patients. Mowat (1966) found that many of his sample of morbidly jealous murderers described, as grounds for their delusions and subsequent action, a change in their

wives' emotional attitudes. In their review of homicidal aggression in schizophrenic men Planansky and Johnston (1977) conclude that "transient misperception of danger to life, very frightening and potentially ominous, was distinctly revealed by some men." Of relevance here may be the work of Bemporad (1967) and Reich and Cutting (1982) showing that schizophrenics faced with visual problems were more likely to approach them by concentrating on details rather than on any overall view. In the words of Shakow (1950): "If there is any creature who can be accused of not seeing the forest for the trees, it is the schizophrenic." It may be that schizophrenia renders sufferers prone to concentrate on one or two threatening aspects of a situation which would be innocuous if viewed in overall perspective.

Insight

The meaning, in psychiatric phenomenology, of the term insight is notoriously confused. Some authors have gone so far as to suggest that the concept is "Eurocentric" and "arrogant" and ought to be abandoned (Perkins and Moodley, 1993). Aubrey Lewis defined the phenomenon as, "A correct attitude to morbid change in oneself" (Lewis, 1934). While concise, this definition is less than complete, begging, as it does, the question of what is a correct attitude. Does this involve recognising that something is wrong or

recognising the need to do something about it? The issue has been reviewed by David (1990). He and other authors (see McEvoy *et al*, 1989) have distinguished three elements of insight: the ability to recognise that one is ill, a willingness to seek treatment and an ability correctly to label certain phenomena as abnormal. It seems reasonable to suppose that the third of these elements, at least, would influence the likelihood of a patient acting on his or her delusions. A persecuted man should be less likely to take defensive measures if he appreciates that his persecutory beliefs are part of a psychiatric illness.

Little research has been conducted in this area. Roback and Abramowitz (1979) studied the behaviour of patients with schizophrenia in hospital and found that those with a greater level of insight were rated as better adjusted behaviourally on nine out of twelve measures. Van Putten *et al* (1976), Lin *et al* (1979) and Bartko *et al* (1988) all found that compliance with treatment was improved in patients who were rated as exhibiting more insight. There is a methodological problem, however, which is shared by all four of these studies. Decreased insight and behaviour could both be indicators of the severity of a patient's illness. The patients of Roback and Abramowitz who were insightful and behaviourally adjusted may have been less ill as may have been the subjects in the other three studies who possessed insight and complied with medication. In any case,

influencing behaviour in general is not the same as influencing actions based on delusions.

Motor changes

In depression, psychomotor retardation inhibits all types of action and the increased risk of suicide attendant on the lifting of this retardation with treatment has long been recognised. In schizophrenia, the catatonic symptoms have been reviewed by Abrams and Taylor (1976). Of these, the possibility of explaining stereotypies in delusional terms has already been mentioned (Jones, 1965). As pointed out by Mayer Gross *et al* (1960), however, this is very different from establishing a psychological cause and in any case the behaviours described by Jones are invariably of little consequence. Other catatonic symptoms such as negativism and stupor can be expected to influence actions based on delusions in the same non-specific and inhibitory way in which they influence all behaviour.

Drive, motivation and affect

Perhaps more important influences on motor behaviour in psychosis are such factors as drive, inclination and motivation. These concepts are very close to that of

"desire" as described by McGinn (1979) who considered it a pre-requisite for action based on belief. They also bear comparison with the concept of "affectivity" described by Eugen Bleuler in 1924:

"Action is for the most part influenced by affectivity, if one at least agrees with us when we designate the force and direction of the impulses, or of the 'will' as partial manifestations of the affects. He who is happy, sad or furious will react accordingly." (p.143).

In normal subjects the drive and inclination to act are closely linked to the affective and emotional aspects of a belief and it seems likely that the chances of a delusion being acted upon will be influenced by similar factors. In depression the link between a delusion and its affective component is so close that it becomes impossible to distinguish the two: the fact that psychiatrists use the term "mood congruent" to describe certain delusions reflects the fact that these delusions are regarded as having an emotional quality which is inseparable from the belief itself. Any discussion of whether a psychotically depressed patient kills himself because of what he believes or because of what he feels rapidly becomes one of semantics. Similarly in mania it is difficult to differentiate between grandiose delusions and hypomanic affect as the cause of a patient's extravagant behaviour.

In chronic schizophrenia a reduction in the capacity to experience pleasure has been described by several authors (Harrow *et al*, 1977; Watson *et al* 1979; Cook and Simukonda, 1981). It is unclear whether a similar reduction occurs in the capacity to experience other emotions although work previously mentioned, describing schizophrenics' difficulties in perceiving such emotions as anger (Spiegel *et al*, 1962) provides some circumstantial evidence that this is the case. If so, it might be expected that the delusions of schizophrenics, charged with less emotion than those of others, should be acted upon less often. Other workers, however, have reached different conclusions. Feffer (1961) presented neutral and emotionally charged words to schizophrenic subjects and normal controls and found that schizophrenics avoided words with an affective connotation. Garety and Hemsley (1987) found that a high proportion of deluded subjects found their delusions distressing. The work of Vaughn and Leff (1976), showing that schizophrenics living with high "expressed emotion" (EE) relatives were more prone to relapse, and later work (Leff *et al*, 1982) showing that relapse rates fell when EE was reduced, would suggest that people with schizophrenia are sensitive to the emotional aspects of their environment. It seems likely that the emotional responsiveness of schizophrenics is not simply reduced but altered in quality. It may be that people with schizophrenia attach emotion inappropriately to certain

beliefs, including delusional ones, and are then more likely to act upon them.

Cognitive factors

The non-specific effect on behaviour of depressive psychomotor retardation has already been mentioned. With regard to schizophrenia, several varieties of cognitive deficit, which could affect the likelihood of a delusion being acted upon, have been proposed. Firstly, Frith (1987) described a model for first rank symptoms and "negative signs" in schizophrenia. First rank symptoms, he argued, are consequent upon defective monitoring of action while negative signs result from an imbalance between "willed intentions" and "stimulus based intentions". A later paper (Frith and Done, 1989) provided some experimental evidence for the first of these proposals but not for the second relating to negative symptoms and the specific implications for delusional behaviour are unclear. Secondly, an impaired ability to make probabilistic judgements has been described (Huq *et al*, 1988). Thirdly, and as discussed earlier, specific cognitive deficits have been invoked with regard to perception. In more general terms, it has been argued that the relatively intact cognitive function of chronic paranoid patients is associated with a greater propensity for planned violence than is the impaired cognitive function of patients

with an acute psychosis (Krakowski *et al*, 1986; Wessely, 1993). It is not clear that this association represents a causative link, however, or what form such a link might take.

Finally, there are numerous reports of memory impairment in schizophrenia independent of the effects of poor motivation and drug treatment (see Tamlyn *et al*, 1992). The nature of this impairment, however, is unclear. There are reports of selective deficits in respect of items with an emotional content (Koh *et al*, 1981) and verbal recall (Lawson *et al*, 1964; Yu and Johnson, 1979). Some have suggested a failure of long-term, semantic memory (Koh, 1978; Calev *et al*, 1987), while others have described a loss of recall for more recent events. Robertson and Taylor (1985), for instance, tested a group of men held in prison or maximum security hospital on criminal charges and found that their deluded group showed a deficit of "immediate memory". It is possible that such memory deficits are the result of the impaired use of mnemonic strategies (Lawson *et al*, 1964; Yu and Johnson, 1979): Bauman (1971) showed that schizophrenics' memory for three letter sequences failed to improve even when it was pointed out to them that the sequences began with consecutive letters of the alphabet. Robertson and Taylor argued that, as a consequence of their memory deficits, deluded patients were likely to misinterpret external stimuli.

Although a distinct thread has yet to emerge from the investigation of cognitive function in schizophrenia, this area of research does offer some correspondence with theoretical writing on the subject of delusions. The views of Fulford (1989) with regard to the importance of belief in the genesis of action have already been mentioned. The work of the same author offers the tantalising suggestion that the link between a delusion and an ensuing action may be impaired in a way which is inseparable from the genesis of the belief itself. Fulford rejects the conventional definitions of delusion pointing out, *inter alia*, that many delusions are not beliefs at all but value judgements. He suggests that delusions could better be described as "defective reasons for action." Could these defective reasons be the products of defective reasoning, defective reasoning which also produces the cognitive deficits described here? Fulford argues that the nature of any such link is unclear and that considerable clinical and philosophical work is required even to clarify the issues involved.

Other factors

Several other aspects of the mental states of psychotic patients have been implicated in delusional action. Numerous

reports exist describing an association between blunting of affect and self harm based on delusions (Shore, 1979; Greilsheimer and Groves, 1979; Waugh, 1986). Mullen (1988) has argued that emotional blunting is associated with violence in schizophrenia. Hafner and Boker (1973), however, in their large study of mentally abnormal offenders, found that "only a small proportion of schizophrenic offenders have flatness of affect." Some of the issues involved have been discussed in the section covering drive, motivation and affect. The degree of systemisation of delusions was found by Hafner and Boker to be related to violent behaviour and several less methodologically sound studies, reviewed by Krakowski *et al* (1986), have reached similar conclusions. The presence of hallucinations or perceptual changes in cases where delusions of infidelity and poisoning are associated with violence has been referred to by Shepherd (1961), Mowat (1966) and Varsamis (1972). In mania, Schipkowensky (1968) has invoked the "pathologically increased social connection of the manic" to explain what he regards as a very low incidence of violence in these patients (quoted by Krakowski *et al*, 1986).

1.5. Conclusions regarding the literature

This chapter has reviewed the theoretical basis for action, pointing to the reappearance of beliefs as important causes of action after a period during which more behaviourist explanations held sway. A model has been described whereby action is seen as caused by a combination of belief and desire and triggered by factors such as "noticings". It has been argued that these concepts correspond to some of the findings of psychiatric research. "Desire" may well correspond to psychiatric concepts of motivation, drive and affect and "noticings" find likely equivalents in the field of perceptual changes, perhaps influenced by other cognitive aspects of psychosis. The correspondence is far from exact, however, and the details of how desires and beliefs are triggered by "noticings" to form the intention to act have not been clarified for healthy subjects, let alone for patients suffering from psychosis. As Fulford (1989) has pointed out, avenues of research in this area are legion and underexplored.

An improved understanding of the likelihood of delusions being acted upon would help psychiatrists to assess the risk to the psychotic patient and to others. To this end it would be advantageous to be able to attribute risk either to the belief itself or to other features of the patient's

psychosis. Unfortunately, most of the studies quoted here rely on a violent or otherwise spectacular act for their case ascertainment. As a consequence, it is impossible to judge how likely it is that a particular delusion will be associated with action. We do not know how many people have similar beliefs without acting on them because such cases do not tend to be reported. There is a clear need for more broadly based studies of delusional action if an understanding of the risk of delusional action is to be approached.

In 1941 Aubrey Lewis wrote:

"Patients often do not act in accordance with their delusional beliefs, especially when these are fleeting or chronic ... But this is, on the whole, unusual in the early or acute stages of the illness: a patient will then act on his beliefs violently or in terror; he may go to the police or be driven to suicide" (p.1189).

Lewis alludes to two factors which have been discussed here, namely the chronicity of delusions and their emotional context. It seems that research could also usefully measure such aspects of phenomenology as conviction and preoccupation and quantify the behavioural correlates of these components. Measurement of the behavioural correlates of other aspects of psychosis such as insight and affective incongruity and also seems likely to be of value. It was in the light of these considerations that the present research

was designed.

2. The Aims

The general aim of the present research was the description of the phenomenological correlates of acting on delusions. More specifically, four predictions were being tested.

The first was that certain aspects of the phenomenology of a delusion would be associated with action. People who hold their beliefs with conviction seem likely to act. The work of McGinn (1979) suggests that those who notice things in the world around them which relate to their beliefs should similarly be more prone to do so. Where there is a strong affective component to the belief, action should also be more common. Systematisation of delusions, it has been suggested, is associated with an increased likelihood of a subject acting. Pre-occupation ought to have a similar effect. Finally, increasing levels of insight should reduce the chances of a subject acting on a delusion, particularly where this increased insight involves a recognition, on the part of the subject, that his delusion is a symptom of illness.

The second prediction was that these "phenomenological correlates of action" would be stable over time. This is not an issue discussed in the literature. Clinical experience suggests, however, that many other aspects of phenomenology

are stable in this way. It seems reasonable to predict, therefore, that the correlates of action will also be more than ephemeral. If the phenomenology of acting on delusions is transitory then the potential for predicting action is limited.

The third was that the phenomenology of acting on delusions would be independent of the classification of delusions on other grounds. Again, this is not an issue discussed in the literature. Delusions are usually classified according to content (persecutory, grandiose, religious and so on). Part of an understanding of delusional action must involve establishing whether it is the content of the delusion, or some other aspect of the phenomenology, which is associated with action.

The fourth prediction was that the phenomenology of action would be independent of the nature of that action. Action, as noted above, takes many forms. Some aspects of delusional action are of particular interest for specific purposes. The phenomenological correlates of aggressive acts, for instance, are of relevance in risk assessment. It is important to establish whether particular features of phenomenology are associated with particular forms of behaviour.

3. The Method

3.1. The procedure

A daily check was made on the adult wards of the Bethlem and Maudsley Hospital and Dulwich Hospital in London over a seven month period to identify those patients who had been admitted and who were likely to fulfil the entry criteria. These were that the subject be aged 18 or over, not suffer from an organic psychosis and describe at least one delusion which was not mood-congruent. Sufferers from organic psychoses were excluded because it was felt that the transience of many of their psychotic phenomena would make it difficult to conduct serial testing. Mood-congruent beliefs were excluded because of the difficulty, described in the introduction, of distinguishing the behavioural consequences of the mood state from the behavioural consequences of the delusion.

One hundred and six subjects, identified in this way, were presented with that section of the Present State Examination (P.S.E.; Wing *et al*, 1974) which covers the presence or absence of delusions (items 71-92). The delusion was required to be a "full" delusion according to P.S.E.

criteria, that is, the subject required to be convinced as to the veracity of the belief. In eight instances no such delusion was identified and the subject was not asked to participate; ninety eight patients fulfilled the entry criteria. Fifteen of these either refused to participate in the study or were too thought disordered to be interviewed, the minimum requirements of an interview being the identification of a Principal Belief (see below) and the recording of the subject's own description of his or her behaviour (Section 4 of the M.A.D.S.; see below and Appendix 1, page 208). The final sample therefore consisted of 83 subjects. All were interviewed within four weeks of admission.

At interview the remaining items of the P.S.E. were completed. Those delusions which had been identified using the P.S.E. were then presented to the subject who was asked which of them was most important to him or her. The phenomenology of this delusion, henceforth labelled the "Principal Belief", was then investigated using a new instrument which was being tested, the Maudsley Assessment of Delusions Schedule (M.A.D.S.; Wessely *et al*, 1993; Taylor *et al*, 1994). The items contained in this instrument, along with their inter-rater reliabilities, are attached as Appendix 1. Where two or more delusions were adjudged to be equally important by the subject the decision as to which was to be labelled the Principal Belief was made according

to which was held with the greatest degree of conviction. Three to five days later each subject was re-interviewed and the M.A.D.S. again completed.

At either the first or the second interview estimates were made of each subject's pre-morbid and current intellectual function. Pre-morbid I.Q. was estimated using the National Adult Reading Test (N.A.R.T.; Nelson, 1991). Current function was estimated using the Digit Symbol Sub-Test of the Wechsler Adult Intelligence Scale (W.A.I.S.-R.; Wechsler, 1981). Various short forms of the W.A.I.S.-R. are available and would have provided alternative means of assessing current function (see Crawford *et al*, 1992). All involve a compromise between ease of administration and validity. The Digit Symbol Sub-Test was chosen for this study partly for ease of administration to a sample who were already being asked to participate in a lengthy interview and partly because of its emphasis on attention and concentration, those aspects of cognitive function which were felt to be of most relevance to subjects' performance in such an interview.

For each subject an attempt was made to obtain, from an informant, a description of the subject's behaviour in the month prior to the interview. Fifty nine informants were interviewed by an investigator blind to the nature of the subject's delusions. No informants could be identified for

16 subjects and for eight an informant was identified who could not be traced. The informants were usually close relatives of the subject but social workers, nurses and hostel staff were also contacted where they, rather than relatives, were best able to describe the subject's behaviour. The informants were interviewed using the instrument shown in Appendix 2.

3.2. The sample

The mean age of the sample was 33 (minimum 18, maximum 66, standard deviation 11.9) and 46 (55%) were male. Fifty two (63%) had never been married, 11 (13%) were currently married and 20 (24%) were widowed or divorced. Fifty two subjects (63%) were unemployed on the day they were admitted and twenty three (28%) had been continuously unemployed for the previous five years. Only 8 (10%) had been continuously employed over the same period. The mean interval between the onset of the subject's illness and interview was 7.4 years (minimum 0, maximum 32, standard deviation 8.2, median 5) and the mean number of admissions which the subject had experienced over this period was 2.8 (minimum 0, maximum 12, standard deviation 3.0). For 35% of the subjects this was their first admission.

For the 69 subjects who completed a full P.S.E. the CATEGO classifications were schizophrenia (62%), paranoid psychosis (9%), affective psychosis (26%) and other psychosis (3%). The prevalence of affective psychosis is higher than one might expect given that mood-congruent delusions were excluded. This may indicate that people with substantial abnormalities of mood can nevertheless demonstrate non mood-congruent delusions. It may also reflect the difficulty of determining whether or not a delusion is mood congruent.

Mean pre-morbid full-scale I.Q. as estimated from the N.A.R.T. was 102 (minimum 69, maximum 127, standard deviation 17). The mean score on the Digit Symbol Sub-Test of the W.A.I.S.-R. was 34 (minimum 9, maximum 61, standard deviation 12.4). This is considerably below the average score for this age group, which lies between 57 and 61, and the standard deviation is considerably larger. This is what one would expect in a patient group of average pre-morbid intelligence who have recently been hospitalised as a result of becoming psychotic. The mean interval between admission and interview was 10.1 days (minimum 0, maximum 26, standard deviation 6.9).

The interview required, at least, the identification of a Principal Belief (which required, in turn, the completion of items 71 to 92 of the P.S.E.) and scoring of the behavioural ratings contained in Section 4 of Appendix 1. The completion of items 71 to 92 of the P.S.E. also allowed the description of the full range of each subject's delusions. Two ratings are available. The first is for "partial delusions", defined as, "delusions which are expressed with doubt, or as possibilities which the subject entertains but is not certain about. This rating should not be used if it is clear that full delusions have been present during the month, or if the subject has acted as if fully deluded." The second is for "full delusions" which are described much more briefly: "Fully convinced. No insight" (Wing *et al* 1974, p.215). The

frequency of each rating for each category of delusion is shown in Table 3.2.1.



Table 3.2.1. Frequencies of occurrence of partial and full delusions by content of the delusion.

Content of delusion	Partial delusion	Full delusion	Total	% of Sample
Religious	1	17	18	22
Paranormal	6	15	21	25
Physical influence	5	8	13	16
Infidelity	0	2	2	2
Assistance	4	9	13	16
Persecution	21	31	52	63
Catastrophe	7	7	14	17
Grandiose	3	16	19	23
Guilt	2	7	9	11
Physical appearance	1	4	5	6
Hypochondriasis	4	6	10	12
Depersonalization	0	0	0	0
Sexual	2	9	11	13
Pregnancy	1	0	1	1

Reference	8	26	34	41
Control	4	12	16	19
Fantastic or memories	4	24	28	34
Thought insertion	3	15	18	22
Thought broadcast	5	14	19	26
Thought echo, commentary	10	5	15	18
Thought block, withdrawal	4	12	16	19
Thoughts read	12	13	25	30

The category "Reference" consists of responses to items 72 and 73 of the P.S.E., items which cover "delusions of reference" and "delusional misinterpretation" respectively but which define the two phenomena in similar terms. Other categories contain responses to one P.S.E. item only. Two of the categories described here, namely, delusions of physical influence and delusions of control, sound extremely similar. The distinction employed was that described in the P.S.E. where, in describing delusions of control, it is stated, "The essence of the symptom is that the subject experiences his will as replaced by that of some other force or agency"

(p.167). This definition is almost identical to that provided by Hamilton in respect of "passivity feelings" (Hamilton, 1985, p.85). Delusions of physical influence, as defined here, are the responses to Item 80 of the P.S.E., "Is anything like electricity, or X-rays, or radio-waves affecting you?" The category thus includes delusional explanations of normal and abnormal phenomena but invokes no requirement that the subject's will be subjugated to outside forces. "Fantastic or memories" refers to item 87 of the P.S.E. and includes delusional memories, confabulations and fantastic delusions. There are two reasons why the sum of the "Total" column of Table 3.2.1 is much larger than the sample size. Firstly, many subjects had more than one delusion. Secondly, one delusion can belong to more than one category. Thus the Principal Belief of one subject was that evil spirits were trying to harm her: this was rated as a full delusion in two content categories, religion and persecution.

If a subject identified more than one "full" delusion (according to P.S.E. criteria) they were asked to state which of the beliefs was the most important to them. This delusion was labelled the Principal Belief and the categories into which it fell are indicated in Table 3.2.2.

Table 3.2.2. Frequency of occurrence of various types of delusional content in the Principal Belief

Content of Principal Belief	Number of Subjects
Persecution	24
Religion	8
Physical influence	6
Reference	6
Control	6
Fantastic, memories	6
Grandiose	4
Paranormal	3
Assistance	3
Physical appearance	3
Other	18

The commonest category of Principal Belief was, therefore, persecutory. Examples included, "My mother wishes to harm me," "Mr. X [a neighbour] is making plans to harm me," and, "I believe an Irish republican group has an interest in me."

The second commonest category was that of religious delusions: "Jesus speaks to me because I am special," and, "I am in telepathic contact with God."

Next most common were delusions of physical influence, reference and control and the combined category, corresponding to item 87 of the P.S.E., which included delusional memories, confabulations and fantastic delusions. Examples of delusions of physical influence included, "Electricity is being beamed through the floor and is affecting my body," and, "I can make and receive radio signals." Delusions of reference included, "People discuss me by saying things to each other with double meanings," and, "People say things with double meanings to see which side I'm on." The presence of delusions of control hinges on whether the subject feels that his will has been replaced (see page 53). This is not an experience which can easily be described in a sentence. Statements made by subjects with delusions of control included, "The voice which talks to me can control the way I feel," and, "I believe I am controlled by an outside influence." The combined category included, "Evil spirits touch my skin and take my flesh," "White people follow evil," and, "Whatever I do affects the subconscious of the whole race." Finally, the "Other" group in Table 3.2.2 includes delusions of guilt such as, "I believe I was possessed by a force of evil," delusions of thought reading or thought insertion and delusions of

infidelity such as, "My wife is having affairs." Thought reading and thought insertion, as well as other disorders of the possession of thought such as thought broadcasting, are sometimes regarded as experiences rather than as delusions. They are classified as delusions here because this is the approach taken by the P.S.E.. Each of the content categories in the "Other" group in Table 3.2.2 included the Principal Belief of two subjects or less.

3.3. The variables

Behavioural variables

Self-reported delusional action

Information regarding the subject's behaviour was available from the subjects themselves for 83 (100%) of the sample. Each subject was asked a number of questions pertaining to the behavioural consequences of the Principal Belief; these questions are shown in Section 4 of Appendix 1. The period covered was the month prior to the interview. As part of an examination of the prevalence of delusional action, the responses to these items were subjected to a latent class analysis (Wessely *et al*, 1993). This technique assumes that the associations among observed variables are generated by underlying classes within which the variables themselves are independent (Everitt, 1986). The data were best fitted by a three class model. One class was characterised by lack of self-reported action based on the delusion or by single such actions; this class contained 60 subjects (72% of the sample). The other two were associated with higher levels of delusion-based action, one characterised by aggressive acts such as hitting people or breaking things (9 subjects, 11% of the sample) and the other by defensive acts such as

taking steps to protect themselves (14 subjects, 17%). For the purpose of the present research the classes characterised by aggressive and defensive actions were combined to produce a group of 23 Principal Beliefs (the Principle Beliefs of 28% of the sample) which were, in the opinion of the subjects themselves, associated with action.

Informant-reported delusional action

Information regarding the subject's behaviour was available from informants for 59 subjects (71% of the sample). As part of the investigation of the prevalence of acting on delusions, each element of behaviour described by these informants had been rated by a panel of four (see Wessely *et al*, 1993). The panel consisted of a forensic psychiatrist, two general psychiatrists and a psychologist. The behaviour was rated as being unrelated (31 subjects, 52% of those for whom information from informants was available), probably related (11, 19%) or definitely related (17, 29%) to the Principal Belief (Wessely *et al*, 1993). For the purposes of the present research the probable and definite categories were combined to form a group of 28 Principal Beliefs (48% of that part of the sample for whom information from informants was available) which were judged to have been acted upon. The differences in the prevalences of delusional

action, as measured by the two behavioural variables described here, will be returned to on page 161.

Phenomenological variables

The items used to assess the phenomenological variables are shown in sections one to three and five to eight of Appendix 1 (see page 208). Pronounced formal thought disorder limited the amount of information which could be obtained in a small number of cases. Data were obtained for between 73 and 79 subjects, depending on the item. The exact numbers are given in the Results.

Conviction

Subjects were asked how sure they were about the truth of their delusion and their responses rated. There were five possible responses: "absolutely certain", "almost certain", "quite certain", "have some doubts" and "doubt it".

Belief maintenance factors

Subjects were asked why they continued to believe their delusion. They were asked whether internal events (such as

mood changes) or external events had occurred and whether these had occurred at any time since the idea first came to them or in the last week. Finally, they were asked whether they actively sought out information to confirm or refute their belief.

Affect

Subjects were asked whether the delusion in question made them feel happy or elated, unhappy or miserable, frightened, anxious or, finally, angry. Their responses were rated as "yes" or "no".

Preoccupation

This was rated according to the criteria used in the P.S.E.. There were four ratings. The first was used where the subject was "preoccupied with past delusions only," the second where the subject was, "not preoccupied with them for much of the time," and could, "turn attention to other things without difficulty." The third rating was employed where it was felt that the delusion, "took up most of the subject's attention," and that he or she, "was preoccupied to the exclusion of many other matters." The fourth was used

where the subject could, "hardly discuss anything but delusions."

Systematisation

This was also rated according to the criteria used in the P.S.E.. Thus there were three ratings. The first was defined as, "The delusion is not elaborated into a general system affecting much of the subject's experience. This includes encapsulated delusions." The second comprised, "There is some systematic elaboration, but substantial areas of the subject's experiences are unaffected," and the third, "The subject interprets practically all his experience in delusional terms."

Insight

David (1990) has suggested that insight in psychosis can usefully be regarded as having three components, namely, a recognition of illness, an awareness of the need for treatment and an ability correctly to label as abnormal delusions and hallucinations. There is some evidence that a sub-division of this type is valid (David *et al*, 1992) and it will be used here.

The ability to recognise illness is addressed directly by the first question in Section 7 of Appendix 1, "Are you psychologically unwell in any way ... is there anything wrong with your nerves?" and tangentially by the second question in the same Section, "Do you think that seeing a psychiatrist might help you (has helped you) in any way?"

The subject's willingness to take treatment is examined by the third question, "Do you think that medication might help you (has helped you in any way) ... how?" The ability to re-label psychotic experiences as abnormal is possibly the most difficult element of insight to investigate. Several approaches were adopted. First, subjects were presented with a "hypothetical contradiction" to their delusion (see David, 1990). Thus a patient who believed that other people controlled his actions using radio waves was told by the interviewer that there was no mechanism whereby this could happen. The subject's responses were scored according to whether he ignored the contradiction or denied its relevance, accommodated it into his delusional system ("but you're only saying that because they want you to"), changed his level of conviction in his belief or abandoned his belief completely.

Second, the subject was asked about the possibility that the belief was false using three questions: "Asking you to think about it now, can you think of anything at all that has happened that goes against your belief?" "When you think

about it now is it at all possible that you are mistaken about X?" and, "What would have to happen to make you think that you might be wrong about X?" The first two of these had to be answered "yes" or "no". The subject's response to the third was allocated to one of three categories, according to whether he or she was able to outline evidence which was logically possible, was able to outline evidence but this evidence was not logically possible or was unable to describe any evidence which would lead them to abandon their Principal Belief.

Finally, the degree to which the subject believed that others shared his belief was investigated on the basis that if a subject believed that others shared his delusion he was failing to recognise that it was abnormal. Thus the subject was asked four questions. In response to the first, "How far do you think others share your beliefs?" there were five possible responses: "completely," "to a considerable extent," "to some extent," "hardly at all," "not at all." In response to the second, "Do you ever discuss your ideas with others?" there were two, yes and no. In response to the third, "Do you ever have arguments about your beliefs?" subjects could answer, "frequently (most days)," "quite often (at least once a week)," "sometimes (at least once a month)," "once or twice ever," or "never." The replies of subjects to the fourth, "Earlier I asked you whether or not you felt others shared your belief about X. I'd like to

clarify whether you feel that other people also believe X- either openly, or perhaps without talking about it?", were allocated by the rater into three categories. The first was used where the subject accepted the uniqueness of the delusion or its exclusiveness to a select few people, such as those involved in a plot. The second was used where the subject accepted that others did not openly share their belief but felt that some might do so in private. The third was used when the subject felt that many others shared his belief.

3.4. Data analysis

Data analysis proceeded in five stages. The first involved the use of cross-tabulation, in combination with the chi square statistic and the Mann-Whitney U test, to establish the phenomenological correlates of acting on delusions when delusional action is defined by the subjects themselves. In the second stage the same techniques were employed to establish the phenomenological correlates of delusional action when that action is defined on the basis of informant-reported action.

In the third stage the data from the second interview with the subjects, three to five days after the first, were examined to establish whether those correlations, established from the first interview data, persisted. The fourth stage of the analysis involved investigating the effect of persecutory content, one of only two types of content which were found to increase the likelihood of a delusion being acted upon in a study of the prevalence of delusional action conducted using the present sample (Wessely *et al*, 1993). The other type of content which demonstrated such an association was catastrophe but delusions of catastrophe were uncommon and it was not possible to investigate independently their effect. The fifth stage of the analysis investigated the differences

between the phenomenological correlates of aggressive and defensive action.

A large number of statistical analyses were conducted. In Section 4.1, for example, 24 phenomenological variables were examined to identify those associated with action. This approach increases the number of "type one" errors, that is, the appearance of a statistically significant result by chance. The best known correction for multiple comparisons is the Bonferroni criterion (see Fleiss, 1986). This requires the level of statistical significance at which an association is said to exist, usually a "p" value of less than 0.05, to be adjusted according to the number of comparisons which are to be undertaken. In Section 4.1, application of the Bonferroni criterion would require a "p" value of less than 0.0021 before an association could be said to be present.

The reader may prefer to read the next chapter with this in mind. Some of the associations with self-reported acting in Section 4.1, such as seeking information to confirm the delusion, persist when the Bonferroni criterion is applied. Others, such as feeling frightened by the belief, do not. The study was exploratory, however, and examined the hypotheses described on page 43. The overall error rate is less important than would be the case if no hypotheses had

been identified. All associations found without the use of the Bonferroni criterion are, therefore, reported.

4. The Results

The results are presented in tabular form as Appendix 3 on page 221. The term "significant", when employed in relation to a statistical association, will be used to indicate a "p" value of less than 0.05. The term "non-significant trend" will be used where the "p" value lies between 0.05 and 0.1. For brevity the letter X will be employed to refer to a subject's Principal Belief and the term "actors" to refer to subjects who were judged, according to the criteria described in Section 3.3, to have acted upon their Principal Belief.

4.1. What are the phenomenological correlates of acting on delusions when action is defined by subjects themselves?

Conviction

Phenomenological data relating to the degree of conviction with which the Principal Belief was held were available for 79 subjects (95% of the sample). Fifty two of these 79 (66%) reported that they were "absolutely certain", thirteen (16%)

that they were "almost certain", six (8%) that they were "quite certain", another six (8%) that they "had some doubts" and two (3%) that they doubted whether the belief was, in fact, true. When the levels of conviction of actors and non-actors were compared no statistically significant differences were found.

Belief maintenance factors

Phenomenological data on the reasons offered by subjects in support of the Principal Belief were available for 78 subjects (95% of the sample). When patients were asked why they believed their delusions, 42 described evidence from external events, such as weather changes and events in the news. Thirty six failed to do so. Forty five described evidence in the form of internal events, such as mood changes or hallucinations. Thirty three failed to do so. There was no statistically significant association between describing external or internal evidence in isolation and acting on a delusion. There was, however, a non-significant trend towards those who could identify internal evidence being likely to act (chi-square 7.57; $p < 0.06$) and a similar trend towards an ability to identify external events being associated with action (chi-square 3.24; $p < 0.08$). When subjects were asked whether either type of evidence existed an association was found with acting on the delusion

as shown in Table 4.1.1. When subjects were asked whether either type of evidence had been apparent in the past week a similar association was found (Table 4.1.2). When subjects were asked whether they sought out evidence to confirm or refute their belief an association was again found with acting on that delusion as shown in Table 4.1.3.

Table 4.1.1. Association between the ability to identify evidence (internal or external) supporting the delusion and acting on that delusion

	Actors (%)	Non-actors (%)
Evidence present	23 (100)	46 (84)
Evidence absent	0 (0)	9 (16)
Total	23 (100)	55 (100)

chi square 4.25

p < 0.04

Table 4.1.2. Association between the ability to identify evidence (internal or external) from the past week supporting the delusion and acting on that delusion

	Actors (%)	Non-actors (%)
Evidence past week	22 (96)	34 (62)
No such evidence	1 (4)	21 (38)
Total	23 (100)	55 (100)

chi square 9.17

p < 0.003

Table 4.1.3. Association between seeking information to confirm or refute a delusion and acting on that delusion.

	Actors (%)	Non-actors (%)
Search made	13 (57)	9 (16)
No search made	10 (43)	46 (84)
Total	23 (100)	55 (100)

chi square 12.92

p < 0.001

Affect

Phenomenological data relating to the affective aspects of the Principal Belief were available for 79 subjects (95% of the sample). Eighteen of these (23%) reported feeling happy or elated as a result of their delusion; happiness or elation was not associated with action. Fifty two subjects (66%) reported feeling unhappy or miserable and 45 (57%) frightened as a result of their Principal Belief. The presence of each of these emotions was associated with action (see Tables 4.1.4 and 4.1.5). Fifty three subjects (67%) reported feeling anxious and this was also associated with action (Table 4.1.6). Unsurprisingly, the degree of co-

variance with feeling frightened was very high: of the 45 subjects who reported feeling frightened as a consequence of their Principal Belief, 42 also said that it made them feel anxious.

Table 4.1.4. Association between feeling unhappy or miserable as a result of a delusion and acting on that delusion.

	Actors (%)	Non-actors (%)
Feel unhappy	20 (87)	32 (57)
Don't feel unhappy	3 (13)	24 (43)
Total	23 (100)	56 (100)

chi square 6.44

p < 0.02

Table 4.1.5. Association between feeling frightened as a result of a delusion and acting on that delusion.

	Actors (%)	Non-actors (%)
Feel frightened	19 (83)	26 (46)
Don't feel frightened	4 (17)	30 (54)
Total	23 (100)	56 (100)

chi square 8.71

p < 0.004

Table 4.1.6. Association between feeling anxious as a result of a delusion and acting on that delusion.

	Actors (%)	Non-actors (%)
Feel anxious	21 (91)	32 (57)
Don't feel anxious	2 (9)	24 (43)
Total	23 (100)	56 (100)

chi square 8.61

p < 0.004

Fifty three subjects (67%) said that their Principal Belief made them feel angry. There was a non-significant trend

(chi-square 3.54; $p < 0.06$) towards these subjects being more likely to act.

Preoccupation

Phenomenological data relating to preoccupation were available for 78 subjects (94% of the sample). Two of these (3%) were rated as, "preoccupied with past delusions only." Fifty two (67%) were, "not preoccupied with them for much of the time," and could, "turn attention to other things without difficulty." For a further twenty (26%) the delusion, "took up most of the subject's attention," and he or she, "was preoccupied to the exclusion of many other matters." Four subjects (5%) could, "hardly discuss anything but delusions." No association was found between the level of preoccupation associated with a delusion and the likelihood of that delusion being acted upon.

Systematisation

Phenomenological data relating to the level of systematisation of the Principal Belief were available for 78 subjects (94% of the sample). Twenty of these (26%) were assigned to the first rating category, "The delusion is not elaborated into a general system affecting much of the

subject's experience. This includes encapsulated delusions." Another forty five (58%) were assigned to the second, "There is some systematic elaboration, but substantial areas of the subject's experiences are unaffected." Finally, thirteen (17%) were assigned to the third where, "The subject interprets practically all his experience in delusional terms." No association was found between the level of systematisation of a delusion and the likelihood of that delusion being acted upon.

Insight

The effect of a recognition of illness was tested in two ways. Firstly, the subject was asked, "Are you psychologically unwell in any way ... is there anything wrong with your nerves?" Data were available for 76 subjects (92% of the sample). A total of 19 (25% of those for whom data were available) accepted that they had a mental illness or nervous problem which included the delusion. A further 18 (24%) accepted that they suffered from a mental illness or nervous condition but did not accept that the Principal Belief was part of this illness. Thirty nine (51%) did not regard themselves as ill. The three responses were allocated scores of zero, one and two respectively and the responses of actors and non-actors compared using the Mann-Whitney U test. There was no statistically significant difference

between subjects who acted on their Principal Belief and those who did not. Secondly, the effect of a recognition of illness was tested by asking, "Do you think that seeing a psychiatrist might help you (has helped you) in any way?" Data were available for 76 subjects. Forty six (61%) said that they thought that they needed to see a psychiatrist. Twenty three subjects (30%) did not think that they needed to see a psychiatrist but agreed that they would see one if asked to do so. Seven subjects (9%) saw no need to see a psychiatrist and said that they would only do so under duress. Again, the Mann-Whitney U test was used to investigate the association between the responses of subjects to this item and acting on the Principal Belief. None was found.

The second aspect of insight studied was whether or not the subject indicated a willingness to accept treatment in response to the question, "Do you think that medication might help you (has helped you in any way) ... how?" Data were available for 74 subjects (89% of the sample). Forty four (59%) accepted the need for drug treatment. Twenty five (34%) saw no need for drug treatment but had accepted it when it was offered and five (7%) said that they were refusing medication. The data for actors and non-actors were compared, as described in the last paragraph, using the Mann-Whitney U test. There was a non-significant trend towards actors being more likely to recognise that they

needed treatment (Mann-Whitney U test. Mean rank actors: 31.9. Mean rank non-actors 39.9. $U = 449.0$. $Z = -1.68$. 2-tailed $p < 0.1$).

The final aspect of insight to be examined was the ability to label delusions and hallucinations as abnormal. As described on page 62 *et seq*, this was done in three ways. First, the subject was presented with a contradiction to their Principal Belief, a contradiction couched in hypothetical terms. Data were available for 79 subjects. An association was found between their answers and the likelihood of them acting on that delusion as shown in Table 4.1.7.

Table 4.1.7. Association between the reaction to the hypothetical contradiction of a delusion and the likelihood of a subject acting on that belief.

	Actors (%)	Non-actors (%)
Ignores contradiction	9 (39)	45 (80)
Accommodates into system	1 (4)	0 (0)
Changes conviction	12 (52)	8 (14)
Dismisses delusion	1 (4)	3 (5)
Total	23 (99)	56 (99)

chi square 15.77

p < 0.002

df 3

Those who acted on their Principal Belief were more likely to change their level of conviction when challenged. Those who failed to act, on the other hand, were more likely to ignore the hypothetical contradiction.

The second way in which the ability to label delusions and hallucinations as abnormal was measured was by asking three questions which suggested that the belief might be false: "Asking you to think about it now, can you think of anything at all that has happened that goes against your belief?"

"When you think about it now is it at all possible that you are mistaken about X?" and, "What would have to happen to make you think that you might be wrong about X?" Data were available, with regard to the first two of these questions, for 79 subjects and, with regard to the third, for 75. In response to the first, "Asking you to think about it now, can you think of anything at all that has happened that goes against your belief?", 20 subjects (25%) said that they could. Examples offered included the failure of the police to find anything amiss in response to complaints of persecution and one subject's acknowledgement that he was ill and that the delusion might be a product of his illness. There was a non-significant trend (chi-square 3.27; $p < 0.08$) towards those who could identify evidence going against their Principal Belief being more likely to act on that delusion.

In response to the second question, "When you think about it now is it at all possible that you are mistaken about X?", 31 (39%) of subjects acknowledged that it was. In response to the third, "What would have to happen to make you think that you might be wrong about X?", 23 subjects (31%) were able to outline evidence which it was logically possible to obtain, such as an X-ray picture of their head which showed no sign of a radio transmitter. Eleven (15%) were able to outline evidence but it was not logically possible to obtain this evidence. One subject who believed that "space people"

were reading her thoughts said that she would know that this was no longer happening when she received a message from them saying that they had stopped. Forty one (55%) were unable to describe any evidence which would lead them to abandon their Principal Belief. The responses to the second and third questions were examined, using the chi-square and Mann-Whitney U test respectively, for an association with acting on the Principal Belief. None was found.

The third way in which the ability to label delusions and hallucinations as abnormal was investigated was by asking subjects about the beliefs of others. The subjects were asked four questions. In response to the first, "How far do you think others share your beliefs?" data were available for 74 subjects. Nine (12%) said, "completely", nine (12%) "to a considerable extent," twelve (16%) "to some extent," six (8%) "hardly at all," and 38 (51%) "not at all". In response to the second, "Do you ever discuss your ideas with others?", data were available for 77 subjects. Fifty three (69%) said that they did. In response to the third, "Do you ever have arguments about your beliefs?" data were available for 77 subjects. Three (4%) said, "frequently (most days)", seven (9%), "quite often (at least once a week)", six (8%), "sometimes (at least once a month)", seven (9%), "once or twice ever", and 54 (70%), "never". In response to the fourth, "Earlier I asked you whether or not you felt others shared your belief about X. I'd like to clarify whether you

feel that other people also believe X- either openly, or perhaps without talking about it?", data were available for 73 subjects. Thirty nine (53%) accepted the uniqueness of their delusion or its exclusiveness to a select few allegedly directly involved. Eleven (15%) accepted that others did not openly share their belief but felt that some might do so in private. Twenty three (32%) said that the belief was shared by many others. The responses to all four questions were examined for an association with acting on the Principal Belief, using a chi-square test for the second, "Do you ever discuss your ideas with others?" and the Mann-Whitney U test for the others. None was found.

4.2. What are the phenomenological correlates of acting on delusions when action is defined on the basis of information provided by informants?

Information regarding the subjects' behaviour was available from informants for 59 (71%) of the sample. The phenomenological characteristics of the 28 Principal Beliefs which were adjudged probably or definitely to have been acted upon were compared with the same characteristics of the 31 which were not associated with action.

Conviction

Data were obtained for 57 subjects (97% of those for whom a behavioural rating, based on information provided by informants, was available.) No association was found between the degree of conviction with which a Principal Belief was held and the likelihood of that subject being adjudged to have acted on that belief on the basis of information provided by informants.

Belief maintenance factors

For each of the five items in Section 2 of Appendix 1 (see page 208), data were obtained for 56 subjects (95% of those for whom a behavioural rating, based on information provided by informants, was available.) No association was found between the responses to the first, second, third and fifth of these items. Only in response to the fourth, relating to the presence or absence of external events lending credence to the Principal Belief, was an association found with acting on that belief. The association is shown in Table 4.2.1.

Table 4.2.1. Association between the ability to identify external events supporting the delusion and acting on the delusion

	Actors (%)	Non-actors (%)
Events present	18 (69)	12 (40)
Events absent	8 (31)	18 (60)
Total	26 (100)	30 (100)

chi square 4.78

p < 0.03

Those who were able to identify evidence supporting the Principal Belief were more likely to act on that delusion.

Affect

For each of the five items in Section 3 of Appendix 1, data were obtained for 57 subjects (97% of those for whom a behavioural rating, based on information provided by informants, was available.) No association was found between the responses on these items and acting on the Principal Belief. There was a non-significant trend towards a lack of action consequent upon delusions which were associated with a feeling of elation (chi square 3.45, $p < 0.07$).

Preoccupation

Data were obtained for 56 subjects (95% of those for whom a behavioural rating, based on information provided by informants, was available.) No association was found between the degree of preoccupation associated with a Principal Belief and the likelihood of that belief being acted upon.

Systematisation

Data were obtained for 56 subjects (95% of those for whom a behavioural rating, based on information provided by informants, was available.) No association was found between the degree of systematisation of the Principal Belief and the likelihood of that Belief being acted upon.

Insight

The ability to recognise that one is ill is addressed by the first two items from Section 7 in Appendix 1. On these items data were obtained from 54 subjects (92% of those for whom a behavioural rating, based on information provided by informants, was available.) There was no association between the subjects' responses, on the one hand, and acting on the Principal Belief, on the other. The recognition of a need for treatment is addressed by the third item in Section 7. Data were obtained from 52 subjects (88% of those for whom a behavioural rating, based on information provided by informants, was available) and no association was found with acting. The ability to label delusions and hallucinations as abnormal is addressed by the final eight items in Section 7. Data were obtained from between 52 and 57 subjects (88% and 97% of those for whom a behavioural rating, based on information provided by informants, was available) and,

again, no association was found with acting on the Principal Belief when such action was defined using information provided by informants.

4.3. Are the phenomenological correlates of acting on delusions stable over time?

Data from the second interview with the subjects, three to five days after the first, were examined to establish whether those correlations, established from the first interview data, persisted. A total of 25 subjects who had originally been included in the study either refused to be interviewed for a second time (18), were discharged (five) or deteriorated to the point where it was not possible to interview them (two). Second interviews were therefore conducted with 58 subjects, or 70% of the original sample. Action on the Principal Belief was defined as before using, firstly, information provided by the subjects themselves during the first interview and, secondly, information provided by informants.

Subject-defined action

Conviction

Data were obtained from 58 subjects (100% of those on whom a second interview was conducted.) There was no association between the level of a subject's conviction that the

Principal Belief was true and the likelihood of his or her having acted on that belief.

Belief maintenance factors

Data were obtained from 58 subjects (100% of those on whom a second interview was conducted). With regard to the first, second, fourth and fifth items of Section 2 of Appendix 1, relating to the presence or absence of external events or internal states since formation, the presence or absence of external events or internal states within the last week, the presence of external events in isolation or a history of searching for evidence on the part of the subject, there was no association with self-defined action. Only with regard to the ability to identify an internal state, such as a mood change or a hallucination, maintaining the belief was such an association apparent as shown in Table 4.3.1.

Table 4.3.1. Association between the ability (on second interview) to identify internal states supporting the delusion and acting on the delusion.

	Actors (%)	Non-actors (%)
State present	5 (26)	22 (56)
State absent	14 (74)	17 (44)
Total	19 (100)	39 (100)

chi square 4.65

p < 0.04

Affect

Data were obtained from 57 subjects (98% of those on whom a second interview was conducted.) There was a non significant trend towards an association between a Principal Belief making the deluded subject feel happy or elated and action, by the subject, on that belief (chi square 2.97, $p < 0.09$). All of the other affects examined, namely, unhappiness, fear, anxiety and anger, showed statistically significant associations with action as shown in Tables 4.3.2 to 4.3.5.

Table 4.3.2. Association between feeling unhappy or miserable (on second interview) as a result of a delusion and acting on that delusion.

	Actors (%)	Non-actors (%)
Feel unhappy	18 (95)	24 (63)
Don't feel unhappy	1 (5)	14 (37)
Total	19 (100)	38 (100)

chi square 6.51

p < 0.02

Table 4.3.3. Association between feeling frightened (on second interview) as a result of a delusion and acting on that delusion.

	Actors (%)	Non-actors (%)
Feel frightened	16 (84)	17 (45)
Don't feel frightened	3 (16)	21 (55)
Total	19 (100)	38 (100)

chi square 8.10

p < 0.005

Table 4.3.4. Association between feeling anxious (on second interview) as a result of a delusion and acting on that delusion.

	Actors (%)	Non-actors (%)
Feel anxious	18 (95)	24 (63)
Don't feel anxious	1 (5)	14 (37)
Total	19 (100)	38 (100)

chi square 6.51

p < 0.02

Table 4.3.5. Association between feeling angry (on second interview) as a result of a delusion and acting on that delusion.

	Actors (%)	Non-actors (%)
Feel angry	17 (89)	20 (53)
Don't feel angry	2 (10)	18 (47)
Total	19 (100)	38 (100)

chi square 7.55

p < 0.007

Preoccupation

Data were obtained from 58 subjects (100% of those on whom a second interview was conducted.) There was a non-significant trend towards subjects who exhibited greater pre-occupation with a Principal Belief being less likely to act upon that delusion (Mann-Whitney U test. Mean rank actors: 25.3. Mean rank non-actors 31.5. $U = 291.0$. $Z = -1.72$. 2-tailed $p < 0.09$).

Systematisation

Data were obtained from 58 subjects (100% of those on whom a second interview was conducted.) No association was found between the level of systematisation of a Principal Belief, on the one hand, and the likelihood of that belief being acted upon, on the other.

Insight

With regard to the capacity to recognise that one is ill, data in response to the first two items of Section 7 of Appendix 1 were collected from 57 and 58 subjects respectively (98% and 100% of the second interview sample). Neither showed an association with action. With regard to

the recognition of the need for treatment, data were obtained from 58 subjects. Again, no association was found between a subject's response on this item and the likelihood of that subject acting on his or her Principal Belief. With regard to the ability to label delusions and hallucinations as abnormal, data were collected on between 56 and 58 subjects. Seven of the eight items showed no association with action. Only with regard to the second, "Asking you to think about it now, can you think of anything at all that has happened that goes against your belief?" was there a trend towards those who answered in the affirmative being likely to act. This trend did not reach statistical significance (chi-square 2.98; $p < 0.09$).

Action as defined using information provided by informants

Of the 58 subjects who completed a second interview, a rating of action on the Principal Belief based on information provided by informants was available for 42 (51% of the original sample).

Conviction

Data were available for 42 subjects. No association was found between the level of conviction with which the Principal Belief was held at second interview and the likelihood of that delusion being acted upon.

Belief maintenance factors

Data were available for 42 subjects. No association was found between the responses to the first three items of Section Two of Appendix 1, namely, the presence of internal states or external events supporting the belief at any point, the presence of such events or states in the past week and the presence of internal states alone, on the one hand, and acting on the delusion, on the other. The presence of external events alone, however, was associated with action as shown in Table 4.3.6.

Table 4.3.6. Association between the ability (on second interview) to identify external events supporting the delusion and acting on that delusion.

	Actors (%)	Non-actors (%)
Events present	15 (71)	8 (38)
No events present	6 (29)	13 (62)
Total	21 (100)	21 (100)

chi square 4.71

p = 0.03

Those who acted on their delusion were significantly more likely to be able to identify external events lending support to their belief. With regard to the final item of Section 2 of Appendix 1, there was no relationship between a subject's seeking evidence to confirm or refute a delusion and acting on that delusion.

Affect

Data were available for 41 subjects. There was a non-significant trend towards those who felt happy as a

consequence of the Principal Belief being more likely to act upon that delusion (chi-square 2.73; $p < 0.01$). There was no association between feeling unhappy or miserable, frightened, anxious or angry and acting.

Systematisation

Data were available for 42 subjects. There was no association between the level of systematisation of the Principal Belief and acting on that delusion.

Pre-occupation

Data were available for 42 subjects. There was no association between the level of pre-occupation with the Principal Belief and acting on that delusion.

Insight

Data were available for 41 or 42 subjects. There was no association between the first two items of Section 7 of Appendix 1, relating to the subject's recognition of illness, and action. Similarly, there was no association between the third item in Section 7, relating to the

perceived need for treatment, and acting on the delusion. With regard to the final eight items in Section 7, relating to the ability to label delusions and hallucinations as abnormal, there was generally no association with the proviso that for item 7.7, "What would have to happen to make you think that you might be wrong about X?" there was a non-significant trend towards those who were able to identify evidence which would contradict their Principal Belief being more likely to act on that delusion (Mann-Whitney U test. Mean rank actors: 18.6. Mean rank non-actors 24.4. $U = 159.5$. $Z = -1.74$. 2-tailed $p < 0.09$).

4.4. Do the phenomenological correlates of acting on delusions simply reflect the content of those delusions?

As noted in the Introduction, previous research has suggested that persecutory delusions are particularly likely to be associated with action. This is the case with regard to grouped case reports (Green, 1981; Mawson, 1985; De Pauw and Szulecka, 1988) and large scale series (Hafner and Boker, 1973). In addition, in the present sample, when delusions were analysed according to content, only persecutory delusions and delusions of catastrophe were associated with action (Wessely *et al*, 1993). It is possible that the phenomenological correlates of delusional action, described here, are simply reflections of the content of the delusions. It may be that the associations with affect, for instance, reflect only a tendency for persecutory delusions to be both acted upon and affectively charged. In addition, where subjects have more than one delusion, it is possible that persecutory delusions affect the likelihood of other delusions being acted upon. These two possibilities were investigated separately, first by examining the phenomenological correlates of persecutory Principal Beliefs and then by examining independently those Principal Beliefs where the subject described a persecutory delusion. For

these analyses the measure of action used was that defined by the patient.

The phenomenological correlates of persecutory Principal Beliefs

Conviction

Phenomenological data relating to the degree of conviction with which the Principal Belief was held were available for 79 subjects (95% of the sample). Of these 79, the Principal Belief was a persecutory delusion in 23. When the whole sample was examined for an association between the degree of conviction with which a delusion was held and the likelihood of acting on that delusion, none was found. Similarly, no association was found for either the "persecutory Principal Belief" or "non-persecutory Principal Belief" sub-samples.

Belief maintenance factors

Phenomenological data on the reasons offered by subjects in support of the Principal Belief were available for 78 subjects (95% of the sample). Of these, the Principal Belief was a persecutory delusion in 24 cases. When the whole sample was analysed several items were associated with

acting on a delusion when action was defined by the subjects themselves: the ability to identify internal states or external events supporting the belief since its inception, the ability to identify such factors in the past week and a positive response to the question, "Do you at present (or have you in the past month) looked for any evidence or information either to confirm your view or to test whether it may be mistaken?" In addition, positive responses on the two other items in this section, the ability to identify, in isolation, internal states and external events, showed non-significant trends towards an association with action.

With regard to the first of these items, the ability to identify internal states or external events, present since the inception of that belief and lending support to that belief, there was a non-significant trend towards those who could identify such evidence being more likely to act (chi-square 3.43; $p < 0.07$) when the Principal Belief was persecutory. There was no association with action when the Principal Belief was not persecutory. With regard to the second, the ability to identify evidence within the last week, there was an association between an ability to identify such evidence, on the one hand, and action, on the other, for both persecutory and non-persecutory Principal Beliefs as shown in Tables 4.4.1 and 4.4.2.

Table 4.4.1. Association between the ability to identify evidence (internal or external) from the past week, supporting the delusion, and acting on that delusion (persecutory Principal Beliefs only).

	Actors (%)	Non-actors (%)
Evidence present	10 (100)	8 (57)
Evidence absent	0 (0)	6 (43)
Total	10 (100)	14 (100)

chi square 5.71

p < 0.02

Table 4.4.2. Association between the ability to identify evidence (internal or external) from the past week, supporting the delusion, and acting on that delusion (non-persecutory Principal Beliefs only).

	Actors (%)	Non-actors (%)
Evidence present	12 (92)	26 (63)
Evidence absent	1 (8)	15 (37)
Total	13 (100)	41 (100)

chi square 3.95

p < 0.05

With regard to the third item in Section 2 of Appendix 1, the ability to identify internal states in isolation, there was no association with action for either persecutory or non-persecutory Principal Beliefs. With regard to the fourth, the ability to identify in isolation external events supporting the Principal Belief, there was a non-significant trend towards such an ability being associated with action when the Principal Belief was persecutory (chi-square 3.05; $p < 0.09$). No such trend was evident for non-persecutory Principal Beliefs.

With regard to the fifth item in Section 2 of Appendix 1, the response to the question, "Do you at present (or have

you in the past month) looked for any evidence or information either to confirm your view or to test whether it may be mistaken?" there was an association with action as shown in Tables 4.4.3 and 4.4.4.

Table 4.4.3. Association between seeking information to confirm or refute a delusion and acting on that delusion (persecutory Principal Beliefs only).

	Actors (%)	Non-actors (%)
Search made	7 (70)	2 (14)
No search made	3 (30)	12 (86)
Total	10 (100)	14 (100)

chi square 7.73

p < 0.006

Table 4.4.4. Association between seeking information to confirm or refute a delusion and acting on that delusion (non-persecutory Principal Beliefs only).

	Actors (%)	Non-actors (%)
Search made	6 (46)	7 (17)
No search made	7 (54)	34 (83)
Total	13 (100)	41 (100)

chi square 4.57

p < 0.03

Affect

Phenomenological data relating to the affective aspects of the Principal Belief were available for 79 subjects (95% of the sample). Of these, the Principal Belief was a persecutory delusion in 24 cases. When the whole sample was analysed, feeling happy or elated as a consequence of the delusion was not associated with action when action was defined by the subjects themselves. Several items were associated with acting on a delusion: feeling unhappy or miserable, frightened or anxious as a consequence of that

belief. There was a non-significant trend towards acting on a delusion being more likely if that delusion made the subject feel angry.

When the Principal Belief was persecutory it was impossible to test for an association between feeling happy or elated as a consequence of the delusion and acting on that delusion: none of the twenty four subjects reported feeling happy or elated. There was no association between happiness and action for non-persecutory Principal Beliefs. With regard to feeling sad as a consequence of the Principal Belief, there was no association with action when the delusion was persecutory. When the delusion was non-persecutory, however, there was an association with action as shown in Table 4.4.5.

Table 4.4.5. Association between feeling unhappy or miserable as a result of a delusion and acting on that delusion (non-persecutory Principal Beliefs only).

	Actors (%)	Non-actors (%)
Feel unhappy	11 (85)	22 (52)
Don't feel unhappy	2 (15)	20 (48)
Total	13 (100)	42 (100)

chi square 4.30

p < 0.04

When subjects were asked whether they felt frightened as a consequence of their Principal Belief, there was an association, for persecutory Principal Beliefs, between a positive response and action as shown in Table 4.4.6.

Table 4.4.6. Association between feeling frightened as a result of a delusion and acting on that delusion (persecutory Principal Beliefs only).

	Actors (%)	Non-actors (%)
Feels frightened	10 (100)	7 (50)
Doesn't feel frightened	0 (0)	7 (50)
Total	10 (100)	14 (100)

chi square 7.06

p < 0.008

There was no association between feeling frightened as a consequence of a delusion and acting on that delusion when the analysis was conducted for non-persecutory Principal Beliefs.

When subjects were asked whether they felt anxious as a consequence of their delusion an association was found between the response and action when the delusion was persecutory (see Table 4.4.7).

Table 4.4.7. Association between feeling anxious as a result of a delusion and acting on that delusion (persecutory Principal Beliefs only).

	Actors (%)	Non-actors (%)
Feels anxious	10 (100)	8 (57)
Doesn't feel anxious	0 (0)	6 (43)
Total	10 (100)	14 (100)

chi square 5.71

p < 0.02

There was a non-significant trend towards an association between feeling anxious and acting when the Principal Belief was non-persecutory (chi-square 3.24; $p < 0.08$).

When subjects were asked whether they felt angry as a result of their Principal Belief, there was no association between a positive response and acting when the Principal Belief was persecutory. When the delusion was non-persecutory there was a non-significant trend towards an association between a positive response and acting (chi-square 3.75; $p < 0.06$).

Preoccupation

Phenomenological data relating to preoccupation were available for 78 subjects (94% of the sample). Of these, the Principal Beliefs of 23 were persecutory and the Principal Belief of 55 was non-persecutory. There was no association between the level of preoccupation, on the one hand, and the likelihood of acting on the delusion, on the other, for either the persecutory or the non-persecutory groups.

Systematisation

Phenomenological data relating to the level of systematisation of the Principal Belief were available for 78 subjects (94% of the sample). Twenty three had persecutory Principal Beliefs and 55 non-persecutory ones. There was no association between the level of systematisation and action for either group.

Insight

With regard to the first two elements of insight, the ability to recognise that one is ill and the recognition of a need for treatment, no association had been found with action when the whole sample was examined. Similarly, no

association with action was found when persecutory and non-persecutory Principal Beliefs were analysed separately (data available for 74-76 subjects, 21-22 with a Principal Belief which was persecutory and 53-54 with a Principal Belief which was not).

The final aspect of insight is the ability to label delusions and hallucinations as abnormal. As described on page 62 *et seq*, this was done in three ways. First, the subject was presented with a hypothetical contradiction to their Principal Belief. Data were available for 79 subjects, for 24 of whom the Principal Belief was a persecutory delusion and for 55 of whom it was non-persecutory. When the whole sample was examined, the response to the hypothetical contradiction was associated with action. Those who changed the level of conviction with which they adhered to the delusion were more likely to act. A non-significant trend towards a similar association was found when the Principal Belief was persecutory (chi-square 3.70; $p < 0.06$). When the Principal Belief was non-persecutory, this trend was statistically significant (Table 4.4.8).

Table 4.4.8. Association between the reaction to the hypothetical contradiction of a delusion and the likelihood of a subject acting on that belief (non-persecutory Principal Beliefs only).

	Actors (%)	Non-actors (%)
Ignores contradiction	5 (38)	34 (81)
Accommodates into system	1 (8)	0 (0)
Changes conviction	6 (46)	5 (12)
Dismisses delusion	1 (8)	3 (7)
Total	13 (100)	42 (100)

chi square 11.6

p < 0.009

df 3

The second way in which the ability to label delusions and hallucinations as abnormal was measured was by asking three questions which suggested that the belief might be false (data available for 75-79 subjects, for 22-24 of whom the Principal Belief was a persecutory delusion and for 53-55 of whom it was non-persecutory). When the whole sample was examined a positive response to the first of these questions showed a non-significant trend towards an association with action. When the sample was split a similar, non-

significant, trend was found when the Principal Belief was persecutory (chi-square 3.60; $p < 0.06$) but not when the Principal Belief was non-persecutory.

When the whole sample was examined there was no association between the responses to the second and third of these questions, on the one hand, and action, on the other. When the sample was split there was no association between the response to the second question and action for either the persecutory or non-persecutory Principal Beliefs. With regard to the third question, however, although there was no association between the response and action when the Principal Belief was non-persecutory, persecutory Principal Beliefs were more likely to be acted upon when the subject was able to identify evidence (Mann-Whitney U test. Mean rank actors: 8.60. Mean rank non-actors 13.9. $U = 31.0$. $Z = -2.15$. 2-tailed $p < 0.04$).

The third way in which the ability to label delusions and hallucinations as abnormal was investigated was by asking subjects about the beliefs of others. The subjects were asked four questions. Data were available for between 73 and 77 subjects. When the whole sample was analysed, no association was found between the responses to any of the four questions and acting on the Principal Belief. The findings were the same when the sample was divided. No association was found between the responses, on the one hand

and acting, on the other, either for persecutory or non-persecutory Principal Beliefs.

The phenomenological correlates of acting on a Principal Belief in the presence of a persecutory delusion

Conviction

Phenomenological data relating to the degree of conviction with which the Principal Belief was held were available for 79 subjects (95% of the sample). A persecutory delusion was present in 49 cases and no persecutory delusion was present in 30. When the whole sample was examined no association was found between the degree of conviction with which a delusion was held and the likelihood of acting on that delusion. The same was true when the association was sought, firstly, in the presence of a persecutory delusion and, secondly, in the absence of such a delusion.

Belief maintenance factors

Phenomenological data on the evidence offered by subjects in support of their Principal Belief were available for 78 subjects (95% of the sample). A persecutory delusion was

present in 50 of these cases and absent in 28. When the whole sample was analysed several items were associated with acting on a delusion when action was defined by the subjects themselves: the ability to identify internal states or external events supporting the belief since its inception, the ability to identify such factors in the past week and a positive response to the question, "Do you at present (or have you in the past month) looked for any evidence or information either to confirm your view or to test whether it may be mistaken?" In addition, positive responses on the two other items in this section, the ability to identify, in isolation, internal states and external events, showed non-significant trends towards an association with action.

With regard to the first of these items, the ability to identify internal states or external events, present since the inception of that belief and lending support to that belief, there was a non-significant trend towards those who could identify such evidence being more likely to act (chi-square 3.21; $p < 0.08$) when a persecutory delusion was present. No such association was present in the absence of a persecutory delusion. With regard to the second, the ability to identify evidence within the last week, there was an association between an ability to identify such evidence, on the one hand, and action, on the other, both when persecutory delusions were present and when they were

absent. These associations are shown in Tables 4.4.9 and 4.4.10.

Table 4.4.9. Association between the ability to identify evidence (internal or external) from the past week, supporting the delusion, and acting on that delusion (persecutory delusions present).

	Actors (%)	Non-actors (%)
Evidence present	15 (94)	23 (68)
Evidence absent	1 (6)	11 (32)
Total	16 (100)	34 (100)

chi square 4.06

p < 0.05

Table 4.4.10. Association between the ability to identify evidence (internal or external) from the past week, supporting the delusion, and acting on that delusion (persecutory delusion absent).

	Actors (%)	Non-actors (%)
Evidence present	7 (100)	11 (52)
Evidence absent	0 (0)	10 (48)
Total	7 (100)	21 (100)

chi square 5.19

p < 0.03

With regard to the third item in Section 2 of Appendix 1, the ability to identify internal states in isolation, there was a non-significant trend towards those who could identify such states being likely to act when delusions of persecution were present (chi-square 7.55; $p < 0.06$), but not when persecutory delusions were absent. The findings with regard to the fourth, the ability to identify in isolation external events supporting the Principal Belief, followed a similar pattern. There was a non-significant trend towards those who could identify such evidence being likely to act, but only when persecutory delusions were present (chi-square 3.04; $p < 0.09$).

With regard to the fifth item in Section 2 of Appendix 1, the response to the question, "Do you at present (or have you in the past month) looked for any evidence or information either to confirm your view or to test whether it may be mistaken?" there was an association with action when a persecutory delusion was present (Table 4.4.11).

Table 4.4.11. Association between seeking information to confirm or refute a delusion and acting on that delusion (persecutory delusion present).

	Actors (%)	Non-actors (%)
Search made	11 (69)	5 (15)
No search made	5 (31)	29 (85)
Total	16 (100)	34 (100)

chi square 14.6

p < 0.001

No such association was found in the absence of persecutory delusions.

Affect

Phenomenological data relating to the affective aspects of the Principal Belief were available for 79 subjects (95% of the sample). A persecutory delusion was described by 50 subjects and not by the other 29. When the whole sample was analysed, feeling happy or elated as a consequence of the delusion was not associated with action when action was defined by the subjects themselves. Several items were, however, associated with acting on a delusion: feeling unhappy or miserable, frightened or anxious as a consequence of that belief. There was a non-significant trend towards acting on a delusion being more likely if that delusion made the subject feel angry.

There was no association between feeling happy or elated as a result of the Principal Belief and acting on that belief when the sample was split and the subjects who described (and those who failed to describe) persecutory delusions were analysed separately. With regard to feeling unhappy as a consequence of the Principal Belief, there was an association with action when persecutory delusions were present, as shown in Table 4.4.12.

Table 4.4.12. Association between feeling unhappy or miserable as a result of a delusion and acting on that delusion (persecutory delusion present).

	Actors (%)	Non-actors (%)
Feel unhappy	15 (94)	20 (59)
Don't feel unhappy	1 (6)	14 (41)
Total	16 (100)	34 (100)

chi square 6.32

p < 0.02

No such association was found in the absence of persecutory delusions.

A similar pattern emerged when subjects were asked whether they felt frightened as a consequence of their Principal Belief and when they were asked whether they felt anxious, as shown in Tables 4.4.13 and 4.4.14.

Table 4.4.13. Association between feeling frightened as a result of a delusion and acting on that delusion (persecutory delusion present).

	Actors (%)	Non-actors (%)
Feels frightened	15 (94)	16 (47)
Doesn't feel frightened	1 (6)	18 (53)
Total	16 (100)	34 (100)

chi square 10.1

p < 0.002

Table 4.4.14. Association between feeling anxious as a result of a delusion and acting on that delusion (persecutory delusion present).

	Actors (%)	Non-actors (%)
Feels anxious	16 (100)	19 (56)
Doesn't feel anxious	0 (0)	15 (44)
Total	16 (100)	34 (100)

chi square 10.1

p < 0.002

In both instances the association between affect and acting on the delusion only occurred in the presence of persecutory delusions. No such association was found when the group of 29 subjects who did not describe persecutory beliefs was examined. Finally, the non-significant trend, noted on examination of the whole sample, towards delusions being acted upon when the subject said that the belief made him feel angry, was again found in those subjects who described persecutory delusions (chi-square 3.43; $p < 0.07$). No such trend was found when persecutory delusions were absent.

Preoccupation

Phenomenological data relating to preoccupation were available for 78 subjects (94% of the sample). Of these, 49 described persecutory delusions and 29 did not. There was no association between the level of preoccupation, on the one hand, and the likelihood of acting on the delusion, on the other, for either group.

Systematisation

Phenomenological data relating to the level of systematisation of the Principal Belief were available for 78 subjects (94% of the sample). Forty nine described persecutory delusions and 29 did not. There was no association between the level of systematisation, on the one hand, and action, on the other, for either group.

Insight

With regard to the responses to two questions relating to the ability to recognise that one is ill, data were available for 76 subjects, 47 of whom described persecutory delusions, and no association with action was found when the whole sample was examined. When the sample was split,

similarly, no association was found between the responses on these items, on the one hand, and action, on the other, either in the presence or the absence of persecutory delusions. With regard to a willingness to accept treatment, data were available for 74 subjects (89% of the sample), 45 of whom described persecutory delusions. There was no association between responses on this item and acting on the Principal Belief when the whole sample was analysed. When the two sub-groups were examined, however, a non-significant trend was found, in subjects with persecutory delusions, whereby those who accepted the need for drug treatment were more likely to act (Mann-Whitney U test. Mean rank actors: 19.0. Mean rank non-actors 25.0. $U = 164.5$. $Z = -1.66$. 2-tailed $p < 0.1$). No such trend was evident for subjects who did not describe persecutory delusions.

The final aspect of insight to be examined was the ability to label delusions and hallucinations as abnormal. With regard to the first test of this ability, the response to a hypothetical contradiction, data were available for 79 subjects, 50 of whom described persecutory delusions. The association between action and changing one's level of conviction, noted for the whole sample, was maintained when the analysis was restricted to those subjects who described persecutory delusions (Table 4.4.15).

Table 4.4.15. Association between the reaction to the hypothetical contradiction of a delusion and the likelihood of a subject acting on that belief (persecutory delusion present).

	Actors (%)	Non-actors (%)
Ignores contradiction	7 (44)	28 (82)
Changes conviction	9 (56)	5 (15)
Dismisses delusion	0 (0)	1 (3)
Total	16 (100)	34 (100)

chi square 9.49

p < 0.009

df 2

A similar but non-significant trend was noted for those subjects who did not describe persecutory delusions.

The second way in which the ability to label delusions and hallucinations as abnormal was measured was by asking three questions which suggested that the belief might be false. Data were available for 75 or 79 subjects, between 46 and 50 of whom described persecutory delusions. In response to the question "Asking you to think about it now, can you think of anything at all that has happened that goes against your

belief?", the responses of the whole sample showed a non-significant trend in the direction of those who could think of evidence being more likely to act. When data from those subjects who described persecutory delusions was examined, this trend was significant (Table 4.4.16).

Table 4.4.16. Association a positive response to the question "Asking you to think about it now, can you think of anything at all that has happened that goes against your belief?" and acting on that belief (persecutory delusion present).

	Actors (%)	Non-actors (%)
Think of anything	7 (44)	5 (15)
Think of nothing	9 (56)	29 (85)
Total	16 (100)	34 (100)

chi square 5.03

p < 0.03

By contrast, no such association was found in subjects who did not describe persecutory delusions. With regard to the other questions addressing the possible falsity of the delusion and with regard to the questions regarding the beliefs of others (data available for between 73 and 77 subjects, between 45 and 48 of whom described persecutory

delusions), no association with action was found either for those subjects with, or without, persecutory delusions.

4.5. Do the phenomenological correlates of action differ according to whether the subject acts in an aggressive or a defensive manner?

As described on page 58, a latent class analysis of the subjects' responses to the items of Section 4 of Appendix 1 allowed the division of the sample into three groups. One group consisted of 60 subjects (72% of the sample) who did little. The other two were associated with higher levels of delusion-based action, one characterised by aggressive acts such as hitting people or breaking things (9 subjects, 11% of the sample) and the other by defensive acts such as taking steps to protect themselves (14 subjects, 17%). The data from these two groups was examined in order to establish whether the phenomenological correlates of action were the same for aggressive and defensive actors. Unsurprisingly, in view of the small numbers involved, no statistically significant differences emerged.

4.6. Further statistical analyses

The phenomenology of a delusion is not the only factor which could lead to that delusion being acted upon. Firstly, it was argued by Aubrey Lewis (1941) that patients are more likely to act on their delusions in the early stages of their illness. Lewis was writing before the widespread use of neuroleptic medication but it seems reasonable to suppose that the same inverse association, between duration and action, would apply today. While neuroleptics reduce the prevalence of delusions, it is not clear why they should alter the behavioural consequences of those delusions. After all, they do not seem to influence the likelihood of other beliefs being acted upon. Secondly, it may be that the cognitive function of the subject affects the likelihood of his acting. This could occur because the ability to act in response to any belief requires a certain rational capacity or because an ability to work out the advantages and disadvantages of acting might inhibit some delusional action. Thirdly, acting on delusions, like other forms of behaviour such as criminal activity or engaging in violence, is likely to be age dependent and more common in young people. Finally, it might be argued, the phenomenological correlates of action may vary according to diagnosis.

All four of these possibilities, duration of illness, cognitive function, age and diagnosis were examined using the definition of acting on delusions derived from the subjects' own descriptions of their behaviour. The mean duration of illness of those who acted on their Principal Belief was 7.1 years (standard deviation 7.3 years) and that of non-actors was 7.5 years (standard deviation 8.5 years). The difference between the two groups was not statistically significant. The mean pre-morbid IQ was calculated using the N.A.R.T.. The mean score for actors was 108 (standard deviation 16) and that for non-actors was 100 (standard deviation 17). The difference was not statistically significant. Similarly, there was no significant difference between actors and non-actors with respect to their performance on the Digit Symbol Sub-Test of the W.A.I.S.-R.. The mean score for actors was 35 (standard deviation 12) and for non-actors 33 (standard deviation 13). The mean age of actors was 31.8 years (standard deviation 9.6 years) and the mean age of non-actors 32.9 years (standard deviation 9.6 years). This difference in the ages of the two groups was not statistically significant.

The classification generated by the CATEGO programme was used as an indicator of each subject's likely diagnosis. The forty seven subjects in CATEGO classes S, P and O were examined separately. The phenomenological correlates of action were broadly similar to those which had been

identified for the sample as a whole. For three variables, those corresponding to items 2.1, 2.5 and 3.2 of Appendix 1, what had been a statistically significant association when the whole sample had been examined was reduced to a non-significant trend.

For item 2.1 of Appendix 1, for instance, which asked each subject whether or not he had sought information to confirm or deny his belief, data were available for 46 subjects. The non-significant trend is shown in Table 4.6.1.

Table 4.6.1. Association between the ability to identify evidence (internal or external) supporting the delusion and acting on that delusion (CATEGO classes S, P and O only)

	Actors (%)	Non-actors (%)
Evidence present	15 (100)	25 (81)
Evidence absent	0 (0)	6 (19)
Total	15 (100)	31 (100)

chi square 3.34

p < 0.07

The figures can be compared with those for the whole sample which are shown in Table 4.1.1 on page 72. Although the

level of statistical significance is reduced for the data in Table 4.6.1, the percentages in each cell are similar. The loss of statistical significance is a product of the reduction in the sample size. The situation was similar when the data for items 2.5 and 3.2 were examined in this way. It appears, therefore, that the phenomenological correlates of action for subjects in CATEGO classes S, P and O were similar to those for the sample as a whole.

5. Discussion

5.1 The methodology

If the methodology of a study is inadequate, conclusions cannot be drawn from the results. This, first, part of the Discussion will examine the methodology employed here. The possible shortcomings are several. Firstly, the procedure which has been adopted may be inadequate. Secondly, the sample may be so atypical as to make it impossible to generalise from the findings. Thirdly, the variables employed may be unreliable or invalid.

Procedure

There are several drawbacks to the procedure employed here. One concerns the degree to which it is appropriate to regard action as generated by a single belief. Another relates to the fact that the sample were being treated while the study was in progress. A third concerns the degree to which it is appropriate to describe phenomenology measured at one point in time as a correlate of action which occurred at another. These will be discussed in turn.

To what extent can action be regarded as the product of a single belief? The short answer must be that it depends upon the belief. If I believe that by arming myself I can save my own life and the lives of those around me then my subsequent purchase of a weapon would seem to be explained by the belief. But the belief, in turn, seems to combine several other, "contributory", beliefs. I consider myself to be in mortal danger, for one thing, and believe that unarmed self-defence would be ineffective, for another. None of these, "contributory", beliefs could be regarded as independently sufficient to generate action. The degree to which a belief can be said to influence behaviour depends, in part, on the terms in which that belief is couched and, in particular, on the degree to which the belief incorporates the actor's view of the circumstances in which he finds himself.

A considerable philosophical literature, referred to in the Introduction, pertains to the genesis of action. In this literature action is seen as the product of a combination of desires and beliefs. Some philosophers have divided these desires and beliefs into "first order" and "second order" phenomena. First order desires correspond to "wants" (see, for instance, Frankfurt, 1971; Frankfurt, 1987). Second order desires, such as a wish to be respected or to have a clear conscience, involve a degree of self-monitoring. Frankfurt is no psychoanalyst but his model has echoes of

the id and the superego. Action, to Frankfurt, is the product of a complicated hierarchy of desires and beliefs, many of which are incapable, independently, of influencing behaviour. McGinn (1979) draws a similar distinction, between first and second order phenomena, with regard to beliefs. Second order beliefs involve a degree of self monitoring and are incapable, independently, of generating action. Our beliefs concerning right and wrong, for instance, do not, on their own, lead us to do anything in particular but do influence our behaviour.

Most writers on the philosophy of action, while attributing a crucial role to desires, regard an actor's beliefs as important contributors to what he does (see, in addition to the work of Frankfurt and McGinn, Feinberg, 1970; McGinn, 1979; Moore, 1984). There is good reason to assume that delusions, which are beliefs of a kind, will be similarly implicated. With regard to the issues of "contributory" beliefs and of beliefs of different orders, these were partly dealt with by the methodology. One of the groups defined here as "actors" were themselves identifying instances where a particular belief, the Principal Belief, was a substantial contributor to the behaviour in question. If a belief was merely a minor contributor to a subject's behaviour it is unlikely that he would think of that behaviour when asked the questions relating to the behavioural consequences of his delusion.

A second drawback to the methodology employed here is that the cases could not be regarded as unmodified examples of mental illness. The methodology allowed a four week interval between admission and the research interview. During this time most of the subjects would have received drug treatment. The objection is only partly answered by the observation that most subjects were seen sooner than this, the mean interval between admission and interview being ten days. Sixty five percent of the sample had been admitted previously and it is likely that the majority of subjects were receiving medication before they were admitted. It must be acknowledged that the findings reported here largely refer to the phenomenological correlates of acting on delusions in subjects receiving medication. It is difficult to see how this difficulty could be avoided, however, and, in any case, the result is that the research subjects resemble more closely than they would otherwise the patients whom psychiatrists see in their daily practice.

The third drawback to the procedure employed here is that time passed between the actions on the basis of the delusion taking place and the phenomenology of that delusion being measured. Subjects were asked about their behaviour during the previous month. Many of the phenomenological variables, however, related to the subject's condition at the time of the interview. Two problems arise. Firstly, the subjects may

have forgotten about some of their behaviour consequent upon the delusion. Secondly the phenomenology of delusions may change so rapidly that the correlates of action, described here, correlates such as belief maintenance factors and affect, may bear no relation to the phenomenology of the delusion at the time it was acted upon.

With regard to the first of these problems, the possibility that some behaviour may have been forgotten, several points can be made. Eighty eight percent of subjects who completed the P.S.E. fulfilled the CATEGO criteria for affective psychosis or schizophrenia. There is a known association between affective psychosis and memory impairment in that depressed people may develop a pseudodementia. Ten subjects showed evidence of motor retardation (defined as a score of 1 or 2 on item 110 of the P.S.E.) in association with low mood (defined as a score of 1 or 2 on item 23 of the P.S.E.) and in these instances there is clearly a possibility that some instances of delusional action may have been forgotten or remembered incorrectly.

In schizophrenia, it has been suggested, memory for items with emotional content (Koh *et al*, 1981) and verbal recall (Lawson *et al*, 1964; Yu and Johnson, 1979) are selectively impaired, perhaps through poor use of mnemonic strategies (Lawson *et al*, 1964; Yu and Johnson, 1979). The usual conclusion, however, is that no memory deficit exists in

acute schizophrenia (see Cutting, 1985 for a review). In the chronic form of the condition there is more agreement that memory impairment may be present. Would one expect to find such an impairment in the present sample? Although the mean duration of illness was 7.4 years the median was only five. The mean age was 33, the mean number of admissions was 2.8 and for 35% of the sample this was their first admission. The picture is not one of a sample of whom the majority suffer from the chronic forms of schizophrenia.

Nevertheless, it must be acknowledged that, as with affective psychosis, a proportion of subjects will be failing accurately to remember the details of their actions consequent upon their delusions.

The second point to be made, however, in relation to the possibility that subjects are failing accurately to recall some of their actions, relates to the extent to which the memory impairment of some of the sample can be expected to have influenced the results described here. The most common consequence of memory impairment is that the subject will simply forget certain instances of acting on a delusion. In other words, memory impairment will reduce the apparent prevalence of delusional action. It is conceivable that this will in turn affect the phenomenological correlates of action if the phenomenology of subjects who act and whose memory is poor is substantially different from the phenomenology of those who act and whose memory is

unimpaired. One cannot exclude this possibility but there is no evidence that such a differential effect does, in fact, exist. And, in view of the finding that acting on delusions is not related to cognitive function (see page 130), there is reason to suspect that it does not. Certainly, since it is likely that only a minority of the sample suffered from memory impairment, it seems reasonable to assume that the results reported here are not invalidated by such an effect.

The third point is that the subjects were asked again about their actions consequent upon the delusion when they were re-interviewed three to five days later. Numerous problems attend the use of the responses at the time of this, second, interview, to draw inferences regarding the accuracy of a subject's recall. For one thing, the object of recall, in this case certain forms of behaviour, may have changed. The subject may have acted on the delusion between the first and second interview. For another, part of any discrepancy between the responses at the time of the two interviews will be attributable to deficiencies in the test-retest reliability of the individual items. The issue is discussed further below. Nevertheless, as can be seen from Appendix 4 (see page 224), people who say they acted in a certain way the first time they are interviewed tend to say the same thing the next. This is particularly the case with regard to breaking things (Kappa co-efficient 0.73) and hitting people (Kappa co-efficient 0.69).

The second problem, consequent upon the interval between the delusional action and the measurement of the phenomenology of that delusion, is that the phenomenology itself may change so rapidly that by the time it is measured it bears no relationship to that which was present at the time of the act. There are two approaches to answering this point. The first is to point out that other aspects of phenomenology do not come and go with this rapidity. Thought disorder, mood states and hallucinations, when observed in in-patient populations, may be fleeting but are more likely to be present for days, weeks or months. Delusions, however, may be different in this respect. The definition of primary or autochthonous delusions, for example, requires them to be sudden events.

The second approach is to use the data which was generated as part of the study. A second interview was conducted with 58 subjects, or 70% of the sample, three to five days after the first interview. During this second interview the subject was presented with the same series of questions designed to outline the phenomenology of the Principal Belief. It should be possible, by comparing the responses of the subject during the first and second interviews, to obtain some estimate of the stability of the delusional phenomenology of the sample. The difficulty is that there are two possible sources of measured instability. The first

is low test-retest reliability of the instrument and the second a change in the phenomenology of the delusion. It is not possible, using the data obtained here, to distinguish one from the other. All that can be said is that the inter-rater reliabilities of the items, as shown in Appendix 1, were satisfactory; it seems unlikely that the test-retest reliability will be extremely low.

The degree of agreement between the responses to each item at the first interview and the responses to the same item at the second are shown as Appendix 4. The Kappa co-efficients listed in the Appendix are affected, however, by the number of responses available. A better description of the level of persistence of the phenomenology may be provided by describing the proportions of subjects responding in each way. Thus, with regard to the degree of conviction with which the Principle Belief was held, of those who described themselves as "almost certain" or "absolutely certain" at the time of the first interview, 85% did so again at the time of the second. With regard to belief maintenance factors, of those who could identify external events or internal states at the time of the first interview, 88% could do so again at the time of the second.

A positive response, on first interview, to the first of the questions relating to affect was repeated, at the time of the second, in 73% of cases. For preoccupation, of those

whose delusions were rated as taking up most of their attention at the time of the first interview, 61% were so rated again at the time of the second. Of those who were rated as demonstrating some systematic elaboration, this persisted in 93% of cases. Finally, with regard to insight, those who were rated as failing fully to acknowledge that they were unwell were rated similarly 93% of the time.

It would seem, therefore, with the reservations expressed here, that the associations, described earlier, between acting on a delusion and certain aspects of the phenomenology of that delusion, cannot be dismissed as chance associations between action and continuously changing phenomenology. With the possible exception of pre-occupation, where the inter-rater reliability was also low (see Appendix 1), the phenomenology of the Principal Belief was relatively consistent between the first interview and the second, three to five days later. Three to five days, of course, is not long in terms of the usual time course of a psychotic illness. It would have been preferable to conduct further interviews with the subjects in order to examine in more detail the stability of the various elements of phenomenology and the relationship of these elements to delusional action. This was not done partly because of the amount of time required and partly because it was anticipated that the number of patients lost to follow up, due to their becoming disenchanted with the demands made on

them or losing their Principal Belief, would be unacceptably high. In support of this assessment is the fact that 30% of the sample were unavailable, for various reasons, three to five days after the first interview.

In summary, this section of the Discussion has examined three drawbacks to the procedure adopted in this study. The first relates to the extent to which it is appropriate to regard behaviour as the product of a single belief. In response it has been suggested that, while the issue is a complicated one, some beliefs clearly do have a substantial influence on behaviour and that, at least where action was defined by the subjects themselves, the present methodology went some way towards distinguishing them from other beliefs which have less such influence. The second drawback is that the methodology allowed most of the subjects to receive drug treatment, possibly before the behaviour occurred and in most cases before the research interview. This seems unavoidable.

The third drawback concerned the interval of up to one month, which the methodology permitted to pass, between the behaviour in question and the measurement of the phenomenology. In relation to this third drawback, two particular concerns have been described. The first is that subjects will not be able to remember what they have done over the past month and the second is that the phenomenology

of delusions is, in any case, likely to be unstable. In response to the first concern, that which relates to each subject's memory, three points have been made. The first is that there is little reason to suppose, from the phenomenology of affective illness and schizophrenia in general, or the nature of this sample in particular, that a large number of subjects suffered from memory impairment. The second is that such memory impairment as was present, while reducing the amount of delusional action which the subject was able to report, would not necessarily alter the phenomenological correlates of that action which was recalled. The third point which has been made is that subjects tended to describe their behaviour similarly when they were interviewed again, three to five days later. In response to the second concern, that which related to the possibility that delusional phenomenology is too fleeting for the term "phenomenological correlates of action" to have any meaning, it has been suggested that other aspects of psychotic phenomenology are not transitory in this way and that, three to five days later at least, and with the exception of the level of pre-occupation with which the Principal Belief was held, the phenomenology of that belief was relatively constant.

The sample

The sample consisted of 83 subjects, self selected from 98 patients at the Bethlem and Maudsley Hospital and Dulwich Hospital who fulfilled the entry criteria. The proportion of all patients fulfilling these criteria who entered the study was therefore 84%. It seems likely that the sample is representative of all patients who met the entry criteria. To what extent are those patients who fulfil the entry criteria representative of people with schizophrenia? There are two aspects to this question. The first concerns the general characteristics of the patients and the second the nature of their psychotic phenomenology.

With regard to the general characteristics of the patients, they at least seem to be similar to others classified as psychotic in south London. Jones *et al* (1993) surveyed all admissions to three South London hospitals and selected subjects who had delusions, hallucinations or thought disorder in clear consciousness. The mean age of the sample was 28, five years younger than the sample described here. The authors excluded subjects over 50, however, who represented roughly one sixth of those originally assessed for inclusion. It seems reasonable to assume that the mean age would have been closer to that of this sample had these subjects not been excluded. As was the case here, the sample

contained rather more men than women and most were unemployed.

The mean number of years since first contact with psychiatric services, in the group described by Jones *et al*, was 4.5 as compared with a mean interval between the onset of the subject's illness and the current admission, in this sample, of 7.4 years. By excluding subjects over 50, however, Jones *et al* have omitted those patients for whom the interval between the onset of illness and admission is longest. With regard to diagnosis, schizophrenia was the commonest condition in both samples. Jones *et al* diagnosed 34% of their sample as suffering from various forms of affective psychosis as compared with only 26% who fulfilled the CATEGO criteria here. This difference presumably reflects the fact that subjects who described only mood congruent delusions were excluded from the present study.

The estimated pre-morbid IQ for the two samples was very similar: 106 in that of Jones *et al* and 102 here. No attempt was made by Jones *et al* to measure the intellectual functioning of their subjects at the time of admission and it is not possible, therefore, to establish whether this aspect of the cognitive performance of the two groups varied. It would seem, in summary, that the psychotic sample described here is representative of psychotic patients in the same geographical area.

Is it representative of psychotic subjects further afield? Brown *et al* (1966) followed up 339 patients diagnosed as schizophrenic and discharged from three hospitals in the South of England. The mean age was slightly higher than that of the subjects described here (36 for first admissions and 38 for second or subsequent ones). In other respects, however, the sample used by Brown *et al* was similar to this one. As here, men slightly outnumbered women. The majority had never married. Sixty percent had been unemployed for more than half of the two years which preceded admission and for one third of subjects the index admission was their first.

Another large sample was assembled by Johnstone *et al* (1991). The authors followed up 532 patients with schizophrenia discharged from in-patient and day-patient psychiatric services in north London between 1975 and 1985. The mean age of subjects in the middle of this period was 37 and men slightly outnumbered women. The mean number of admissions (up to 1985) was five. Thirty nine percent of the sample were unemployed at the time of their entry into the study and the majority had never been married (Johnstone *et al*, 1991). The mean pre-morbid IQ was 109 and IQ at the time of entry into the study was estimated at 92 (Frith *et al*, 1991). In general, therefore, the sample described here is similar to the group of patients with schizophrenia

described by Johnstone *et al.* Only with respect to the mean number of previous admissions do the subjects differ substantially. At just under three, this was lower in this sample. At the time Johnstone *et al* measured this, however, the mean age of their subjects would have been 42. The subjects described here were nine years younger and it is not surprising that they had been admitted less.

With regard to the details of psychotic phenomenology, comparison groups are harder to find. The International Pilot Study of Schizophrenia (World Health Organisation, 1973) found delusions of persecution and of reference to be the commonest forms of pathological belief. This is consistent with the findings described here. The World Health Organisation study further describes loss of insight in 37% of subjects. This is roughly the same as the rates reported here for some measures of insight (39% of this sample did not think that they needed to see a psychiatrist) and rather lower than those reported here for others (51% of this sample did not regard themselves as ill). Other investigators, however, have reported higher rates of loss of insight. McEvoy *et al* found that 70% of their sample did not think that they were in need of treatment that over 80% did not think that they were ill. It seems likely that these, extremely high, figures are related to the fact that non-compliance was the reason for admission. Another finding from the U.S.A., that of Appelbaum *et al* (1981), is more in

line with the rates reported here. The authors found that 50% of psychotic patients did not think they needed to be in hospital.

In summary, this section of the Discussion has reviewed the degree to which the present sample is representative of people suffering from delusions. With regard to socio-demographic factors, it seems that the group of 83 subjects described here is typical of a group of psychotic patients admitted to a general adult psychiatry unit in London. Although it is not possible to be certain, it seems unlikely that it is very different from groups of psychotic patients admitted in other parts of Britain. With regard to phenomenology, there are less studies with which to compare. Nevertheless, with regard to the content of the subjects' delusions and their levels of insight, the findings are similar to those which have been reported by other authors.

The reliability and validity of the variables

The terms reliability and validity are used in two ways. Firstly, they are employed to describe instruments and rating scales. Secondly, they are used to describe the individual items of such instruments and scales. When an instrument is designed to measure only one aspect of phenomenology it is possible to describe the reliability and validity of that instrument as a whole. Such descriptions are available, for instance, for the Beck Depression Inventory (Beck *et al*, 1961) and the Wakefield Depression Scale (Snaith *et al*, 1971). The Present State Examination and the Maudsley Assessment of Delusions Schedule, however, each describe several, different, aspects of phenomenology. One might refer to the overall reliability and validity of such instruments by combining the reliabilities and validities of individual items but there is no generally accepted way of doing this. For this reason this section will discuss the reliability and validity of each item in turn.

The inter-rater reliabilities of the items are described in Appendix 1. In general, the inter-rater reliabilities of the items are high. This is what one would expect since the rater is required only to choose between a "yes" and a "no" or to allocate a response into a number of relatively straightforward categories. Only with regard to pre-

occupation and systematisation was the inter-rater reliability other than high. One reason may be that, in order to complete these items, the rater is required, not simply to record a subject's response, but to make a judgement. In addition, the rating of pre-occupation offered the rater four choices and there was, therefore, more opportunity for inconsistency. With respect to systematisation, it may be that the questionable validity of the item placed a ceiling on the reliability which could be achieved. Different raters may have assessed the responses according to different criteria. The issue is discussed further below.

In broad terms, validity refers to the extent to which a test or item measures what it purports to measure. "Face" validity refers to whether or not a variable looks as if it will do so. "Content" validity has a similar meaning but, in addition, in order for it to be said to be present the variable, or instrument, must cover all aspects of the phenomenon. A school test of arithmetic skills should cover subtraction, division and multiplication as well as addition.

"Construct" validity is said to be present when one can identify a series of theoretical correlations between the variable under study and other measures and show that such correlations do, in fact, exist. When one would expect a

correlation and one does, in fact, exist, this is known as "convergent validity". When one would expect no correlation and this, in turn, is what is found, this is known as "discriminant validity". Thus the results of the school test of arithmetic skills, if the test is to be described as showing "convergent validity", should correlate with scores on other tests of such skills but, if it is to have "discriminant validity", should not correlate with other tests of intellectual function. The variables examined here will be discussed in terms of their content and construct validities.

Two forms of validity which will not be discussed will be mentioned briefly. "Predictive" validity is said to exist where a subject's score on one variable correlates with that subject's score, on a variable believed to be related to the previous one, at some point in the future. To use the example of the school test again, it would be said to have predictive validity if the scores achieved by a group of children correlated with their subsequent performance on similar tests. "Criterion" validity has a similar meaning. With regard to the present study, the problem with both is that there is no outcome of which one would expect measures of delusional phenomenology to be predictive. The area has been so little studied in a quantitative fashion that it is not even clear, for instance, whether delusions which are held with greater levels of conviction will be held for

longer. Only with regard to the behavioural variables might one expect a measurable outcome. In particular, delusions which are acted upon might be expected to result in police contact. The difficulty here is that violent conduct in psychotic populations is relatively uncommon. Only two of this sample had engaged in acts of serious violence (see Wessely *et al*, 1993): one drove his wife along a road at dangerously high speed in order to extract a confession of infidelity. Both subjects were rated as "actors", by self-report and informant-based criteria, and both instances resulted in police contact. Such contact is not a sufficiently frequent occurrence, however, for it to allow conclusions to be drawn regarding the predictive validity of the behavioural variables.

With regard to the phenomenological variables pertaining to conviction, belief maintenance and affect (see Appendix 1), all would seem to have content validity. It is difficult to imagine, for instance, an aspect of conviction which is not addressed by the question, "How sure are you about X?" Similarly, most aspects of the ability to identify factors maintaining a belief will be addressed by the question, "Can you now explain why you continue to think that X is so?" It should be noted, however, that the questions regarding affect address only mood states which are consequent upon the delusion. No attempt was made to identify the reverse phenomenon, beliefs which are the consequence of mood

states. Indeed, such beliefs were specifically excluded by the methodology. When the affective component of the Principal Belief is discussed here, therefore, it refers to that aspect of the affect which the subject regarded as consequent upon his or her belief. The construct validities of the variables relating to conviction, belief maintenance and affect are difficult to assess in view of the lack of theoretical correlates of these variables.

The variables relating to pre-occupation and systematisation are derived from the P.S.E.. With regard to pre-occupation, this requires that the phenomenon be rated according to the degree to which the subject is able to divert his or her attention from the delusion and onto other matters. This would seem adequately to reflect the usual meaning of pre-occupation. With regard to systematisation, the situation is more complicated and the content validity of the variable is doubtful. The P.S.E uses a five point rating scale, the first two points on which are to be used if the subject is not deluded. The M.A.D.S. uses the other three points.

The first point on the three point rating scale is employed where the delusion is, "not elaborated into a general system affecting much of the subject's experience". The difficulty is that elaboration into a general system need not go together with affecting much of someone's experience. The frequently persecutory delusions of older subjects were

often highly systematised in the sense that numerous different beliefs existed in a relatively stable network. Nevertheless such subjects often spent much less time interpreting their surroundings in delusional terms than did their juniors whose beliefs were less organised. The second point on the P.S.E. rating of systematisation, "Some systematic elaboration, but substantial areas of the subject's experiences are unaffected," invokes the same two criteria, one relating to the degree of elaboration and the other to the proportion of the subject's life which is affected. The third point on the P.S.E. rating, "Subject interprets practically all his experience in delusional terms", makes no reference to the degree to which the belief is elaborated into a general system.

Finally, with regard to systematisation, the definition employed by the P.S.E. is at variance with that of other authors. Hamilton, for instance, places his emphasis on the degree to which the a subject's abnormal beliefs are built on one logical error (see Hamilton, 1985). The issue of which definition of systematisation should be used is of particular importance with regard to delusions, such as those of infidelity and persecution, where the possibility exists, at least in theory, for a subject's delusions to be the result of one mistake. Where this is the case, one might expect the relative integrity of the remainder of the subject's cognitive function to affect the likelihood of his

abnormal beliefs being acted upon. Some suggestions as to how this could happen were made on page 130. It has not been possible to investigate this issue with the definition of systematisation derived from the P.S.E. and employed here.

The simultaneous use of two sets of criteria in the rating of systematisation employed by the P.S.E. and by this study makes the rating difficult to score. In addition, the criteria are inconsistent. The first two points on the rating require an assessment of the degree of elaboration while the third does not. Finally, the definition of systematisation employed is different from that suggested by other authors. For these reasons the content validity of the variable is questionable. The construct validities of the variables measuring both pre-occupation and systematisation are difficult to assess in view of the lack of theoretical correlates.

The confusion surrounding the meaning, in psychiatric phenomenology, of the term insight was described in the introduction. Also described was Aubrey Lewis' description of insight as, "A correct attitude to morbid change in oneself" (Lewis, 1934). The P.S.E., the instrument used here to identify delusions, employs several definitions of insight simultaneously. Raters are required to ask the subject whether there is anything the matter with them and also whether their delusions are part of their condition.

Insight seems to be regarded as a two stage phenomenon: first, one recognises that one is ill and second, one gains an appreciation that certain phenomena are part of that illness.

Questions surround the content validity of this definition: no mention is made of seeking treatment, a behaviour which many would regard as demonstrating Lewis' correct attitude to morbid change in oneself. With regard to construct validity, until the term is defined in more detail it is impossible to test any theoretically derived correlations between elements of insight and other phenomena. There are reasons to doubt that any such correlations will be consistent unless insight is divided into several elements. Twenty seven percent of the psychotic patients studied by McEvoy *et al* (1989) thought that they needed medication although only 13% of them regarded themselves as ill.

The approach to the measurement of insight adopted here avoids some of these difficulties. Three elements of insight were described in the introduction: the ability to recognise that one is ill, a willingness to seek treatment and an ability correctly to label certain phenomena as abnormal. A scale which distinguishes these elements has been tested and the results suggest that the three elements do not co-vary (David *et al*, 1991). In other words, they exhibit a variety of construct validity, namely, discriminant validity.

Do the variables demonstrate content validity? As described above, this is present to the extent that the full range of attitudes and behaviour under investigation is covered. The variables seem to do this. The first element of insight, the subject's recognition of illness, is addressed by the questions, "Are you psychologically unwell in any way ... is there anything wrong with your nerves?" and, "Do you think that seeing a psychiatrist might help you (has helped you) in any way?" More doubt must surround the assessment of the subject's willingness to take treatment using the question, "Do you think that medication might help you (has helped you in any way) ... how?" It could be argued that this item, concerning, as it does, the past, does not directly address the subject's intentions regarding the future. In particular, it is possible for someone to have received no benefit from medication previously and yet to be willing to try something else. In addition, the question does not distinguish different kinds of benefit. Someone might recognise that their delusions are less troubling when they take medication and yet be so incapacitated by side-effects that, on balance, they do not regard drug treatment as being of benefit. The validity of this item as a measure of a willingness to take treatment is open to question.

The third element of insight identified above, the ability correctly to label certain phenomena as abnormal, has been

addressed using a total of eight items including presenting the subject with a "hypothetical contradiction" to their delusion (see David, 1990) and asking them about the beliefs of others and the possibility that they, themselves, might be mistaken. This area has been little studied and it seems possible to say only that the items employed seem adequately to address the issues at hand. Thus, "How far do you think others share your beliefs?" and, "Earlier I asked you whether or not you felt others shared your belief about X. I'd like to clarify whether you feel that other people also believe X- either openly, or perhaps without talking about it?" seem to address the subject's view of the opinion of others while "Asking you to think about it now, can you think of anything at all that has happened that goes against your belief?" and, "When you think about it now is it at all possible that you are mistaken about X?" seem to address the possibility that the subject is mistaken.

With regard to the behavioural variables, these were two. The first was generated using a latent class analysis of subjects' responses to the questions which form Section 4 of Appendix 1. The second was derived by presenting the Principal Belief of a subject and that subject's behaviour, as described by informants, to a panel and requiring that panel to establish whether or not a link existed between belief and behaviour. The two variables were clearly not reliable and valid measures of the same thing. Firstly, as

described on page 58 *et seq*, the two measures gave very different estimates of the prevalence of delusional action. Secondly, as shown in Table 5.1.1, a positive rating on one did not make a positive rating on the other any more likely. The two variables seem to be randomly distributed with respect to each other. Which provides the more reliable and valid measure of delusional action?

Table 5.1.1. Cross-tabulation of acting on delusions as defined by the subjects themselves ("Subject action") and acting on delusions as defined using information derived from informants ("Informant action").

	Subject action present (%)	Subject action absent (%)
Informant action present	7 (47)	23 (52)
Informant action absent	8 (53)	21 (48)
Total	15 (100)	44 (100)

The first was a measure of action derived from the responses of the subjects themselves to questions about their behaviour. As such, this variable has a certain content validity. The items in Section 4 seem to cover a reasonable

range of behaviours which could conceivably be the consequence of a delusion. The questions address both what the subject has done and what he or she has been stopped from doing. As to whether more can be said with regard to construct and predictive validity, this must await the establishment of some theoretical correlations. This, of course, is what this study has attempted to do but the work has not been undertaken previously.

With regard to the variable which represented delusional action as defined by a panel using information provided by informants, however, it is necessary to be much more guarded. For one thing, the creation of the variable required two assessments to be made, the first by the informant describing the subject's behaviour and the second by the panel deciding whether the behaviour and the belief were linked. In principle it would seem that information from informants should be more reliable than that provided by subjects. Informants are not psychotic, for one thing, and they are less likely to avoid reporting actions which might be embarrassing to the subject.

In practice, the amount of information available to informants was usually very limited. Additionally, establishing a link between a belief and a behaviour, when the two are presented in isolation from other aspects of the subject's mental state, is extremely difficult. Numerous

instances are encountered where a belief could have resulted in an action but this is not to say that it did. One way, perhaps the obvious way, round the problem is to ask the actor. This is what was done in order to generate the first behavioural variable, that which measured action as defined by the subject. When his or her view is not available the validity of a variable which purports to measure the behavioural consequences of an actor's belief must be regarded with suspicion.

5.2 The results

Internal inconsistencies in the results

Even if the methodological objections can adequately be answered, however, there are several issues which call into question the general applicability of the findings reported here. Firstly, there are inconsistencies in the results. One of the entry criteria was that subjects should describe at least one full delusion according to P.S.E. criteria. These criteria were discussed earlier: they require that the subject be fully convinced as to the truth of the belief and possess no insight. How, then, can one explain the responses of the subjects when they were asked how sure they were that the Principal Belief was true? Fifty two (66%) reported that they were "absolutely certain" and thirteen (16%) that they were "almost certain". But six (8%) said that they were only "quite certain", another six (8%) that they "had some doubts" and two (3%) that they doubted whether the belief was true.

There are three points to be made in reply. Firstly, although the P.S.E. requires that the subject be "fully convinced" (Wing *et al*, 1974, p.215) for a full delusion to be said to be present, a partial delusion can only be said to exist where the belief is expressed as a possibility,

"which the subject entertains but is not certain about" (Wing *et al*, 1974, p.215). Clearly, there is a middle ground between these two and some delusions will be rated as full, even in the absence of total conviction, because they come closer to the definition of "full" than to the definition of "partial". Secondly, the P.S.E. is frankly contradictory in this area. Thus delusions are not to be rated as partial if, "it is clear that full delusions have been present during the month, or if the subject has acted as if fully deluded" (Wing *et al*, 1974, p.215). Thus delusions will be rated as "full" even if the subject is not fully convinced at the time of interview, provided that subject seems to have been fully convinced at some time during the past month. Interestingly, the P.S.E. seems to equate a tendency to act on a delusion with full conviction. This assumption has been shown here to be incorrect.

Thirdly, whatever the strengths and weaknesses of the P.S.E., the fact that a sample of recently admitted psychotic subjects reply inconsistently to questions relating to the conviction with which their beliefs are held should come as no surprise. In the related field of insight in psychosis other authors have reported similar inconsistencies, inconsistencies which have been replicated here. Thus 27% of the psychotic patients studied by McEvoy *et al* (1989) thought that they needed medication although only 13% of them regarded themselves as ill. In this study,

with regard to insight, subjects were asked two, very similar, questions at different points in the interview. These were, firstly, "Asking you to think about it now, can you think of anything at all that has happened that goes against your belief?" (item 7.5 from Appendix 1; see page 208) and, secondly, "When you think about it now is it at all possible that you are mistaken about X?" (item 7.6 from Appendix 1). The responses to these questions are cross-tabulated in Table 5.2.1.

Table 5.2.1. Relationship between the responses, at first interview, to two questions, "Asking you to think about it now, can you think of anything at all that has happened that goes against your belief?" (Q 1) and, "When you think about it now is it at all possible that you are mistaken about X?" (Q 2).

	Q 2 "Yes" (%)	Q 2 "No" (%)
Q 1 "Yes"	16 (52)	4 (8)
Q 1 "No"	15 (48)	44 (92)
Total	31 (100)	48 (100)

Fifteen subjects said that they could think of nothing which went against their belief but later in the same interview admitted that it was possible that the belief was wrong.

In summary, the apparent contradiction between, on the one hand, the P.S.E. requirement that full delusions be held with absolute conviction and, on the other, that several subjects in the study described having some doubts as to the veracity of the Principal Belief, does not indicate, of itself, that the methodology of the study is faulty. In part it is a likely consequence of the wording of the P.S.E. which permits two, non-identical, sets of criteria to define a full delusion. In part, however, it is the consequence of interviewing a psychotic sample. Even in response to reliable interview items, addressing similar issues, the subjects in the study gave inconsistent answers.

The findings

The first prediction was that certain aspects of the phenomenology of a delusion would be associated with an increased likelihood of the subject acting on that delusion. This was confirmed, although the particular aspects of phenomenology which showed such an association were not as expected. Also unexpected was the finding that particular aspects of phenomenology were only correlated with acting when action was defined by the subject him or herself. When acting on a delusion was defined using information provided by informants there was little difference between the phenomenology of actors and non-actors.

When action was defined by the subject him or herself, the level of conviction with which the belief was held did not affect the likelihood of that belief being acted upon. The likelihood of acting was correlated, however, with the ability to identify evidence supporting that delusion. In particular, positive answers to the questions, "Can you now explain why you continue to think that X is so?", and, "Do you at present (or have you in the past month) looked for any evidence or information either to confirm your view or to test whether it may be mistaken?", were associated with action.

Affective features, in particular, feeling unhappy, frightened or anxious as a consequence of the Principal Belief, were also correlated with acting. Surprisingly, perhaps, feeling angry was not. Preoccupation and systematisation showed no association with acting, nor did most aspects of insight. It made no difference, for instance, whether the subject regarded him or herself as ill or whether he or she felt in need of treatment. Similarly, most of the items designed to examine that aspect of insight which involves correctly labelling delusions as abnormal showed no association with acting. Only when presented with a hypothetical contradiction did those who acted on their delusions respond differently from those who did not. In response to this challenge, actors were significantly more likely to alter their degree of conviction.

The results are different for the two behavioural variables. There are two possible explanations. The first is that the validity of the variable derived from information from informants is poor. The reasons to suspect that this is the case have already been discussed. If it is not a measure of delusional action and is, instead, simply the product of a panel's ill-fated attempts to make sense of fragmentary information provided by informants, one would not expect it to show any consistent correlation with phenomenological variables. This seems the most likely explanation.

There is another, less likely, possibility. This is that two types of delusional action co-exist. For one type the actor is aware of his or her motivation and for the other he or she is not. The delusional motivation for this second type of action can, however, be discerned by an observer. In favour of this, seemingly remote, possibility is that we are frequently unaware of the reasons for our actions. When this is the case, however, others tend to be equally in the dark, even when they know us well. It seems unlikely that a panel, acting on information provided by informants, could do better. The rest of this discussion will concentrate on action as it is defined by subjects themselves.

It is contrary to what was suggested in the review of the literature that the level of conviction with which the Principal Belief was held was not related to the likelihood of that belief being acted upon. The finding is consistent, however, with another reported here. Most aspects of insight, and, in particular, the capacity to recognise that one is ill and that one's beliefs are abnormal, also failed to show such an association. Acting on a delusion is not simply a product of the strength of a belief and can occur even when one thinks one is ill and acknowledges that one's beliefs may be mistaken. Indeed, the correlations with the responses to the hypothetical contradiction suggest that those who can be argued into altering their level of conviction are more likely to act, not less.

There is another possible explanation, however, for the apparent lack of association between the level of conviction with which a delusion is held and the likelihood of that delusion being acted upon. As described on page 165, the P.S.E. requires the rating of a "full delusion", in the absence of complete conviction on the subject's part, if the subject has acted as if the delusion were true. The presence of a "full delusion" was one of the criteria for inclusion in this study. A form of ascertainment bias is present, therefore, whereby subjects who held their beliefs with less than total conviction (and who would not, therefore, usually be regarded as deluded) were included if their beliefs had affected their behaviour.

It is possible, therefore, that beliefs held with complete conviction are more likely to be acted upon but that this effect has been masked in this study by an ascertainment bias. This bias favoured the inclusion of subjects who were less than convinced as to the truth of their beliefs and who nevertheless had acted upon them. It is not possible to be certain whether such a masking effect did, in fact, occur. The experience of interviewing subjects, however, was that the P.S.E. requirement whereby a "full delusion" is rated where action has occurred was rarely, if ever, invoked. This was in part because the P.S.E. fails to describe how action in this context is to be assessed. Ascertainment bias

probably does not explain the lack of an association between the level of conviction with which a delusion was held and action consequent upon that delusion.

It is not altogether surprising that the level of preoccupation with which a belief was held showed no association with the likelihood of that belief being acted upon. Preoccupation may indicate concern but also implies a degree of inertia: the P.S.E. definition makes reference to the subject being preoccupied, "to the exclusion of many other matters" (Wing *et al*, 1974, p.221). It may be that one of the excluded other matters is the possibility of doing something in response to one's belief. It is more surprising that the level of systematisation showed no association with action. This finding is at variance with those of other authors (Hafner and Boker, 1973; Krakowski *et al*, 1986). It has been argued here, however, that the definition of systematisation adopted by the P.S.E., by the M.A.D.S. and by this study is of questionable validity (see page 155). In these circumstances it is not possible to regard the findings reported here as contradicting those reported elsewhere.

What of the associations which were found? To an extent, it can be argued, the genesis of delusional action follows the scheme suggested by McGinn (1979) for action based on normal beliefs. McGinn suggested that for action to occur, a belief

must be associated with a desire. This explains the association between action and affect, an association which is also consistent with suggestions made by other authors (Bleuler, 1924; see the discussion on pages 33 *et seq*). In addition, in McGinn's view, action is precipitated by "noticings", occurrences in the world around us which act as triggers. That delusional action is generated similarly is suggested by the correlations between action and the ability to identify evidence, from one's surroundings or from one's internal state, in support of that delusion.

This still does not explain why subjects who act are not only able to identify information supporting their belief but actively seek it. It is possible that the explanation relates to the finding, commented upon above, that subjects who question the truth of their delusions are no less likely to act on those delusions than subjects who are fully convinced. If someone doubts the truth of their belief they may well seek evidence to confirm it. And if they find such evidence, albeit evidence which would not convince a non-psychotic person, they may then be more likely to act.

It should be acknowledged, however, that, with a sample size of 83, relatively small effects will produce statistically significant differences. Few of the tables in the Results section allow statements to be made along the lines of, "People who act on their delusions do this," or, "People who

don't act on their delusions do that." All that can be said is that one group is more likely than the other to do this or that. Even if McGinn's model can be used to describe the genesis of delusional action, only probabilistic statements can be made on the basis of the results reported here.

The other caveat to be inserted is that the phenomenological correlates of action, belief maintenance factors, affect and a willingness to alter one's degree of conviction in response to contradiction, may be unrelated to the delusion. They may have their origins in the personality of the subject. Experience would suggest that the opinions, positions and beliefs of some people are more affectively charged than those of others. It is possible, although the issue has not been investigated, that they act on their beliefs more often than do their more easy-going peers. If such a person becomes psychotic their delusions may adopt similar characteristics to their normal beliefs, that is, they will be affectively charged and acted upon.

The same could apply with regard to the ability to identify information supporting a belief. Someone who regularly assumes the worst in people's motives, who perhaps fulfils the criteria for paranoid personality disorder, may be more likely than others to identify evidence in support of their beliefs and more likely to act. These characteristics, an ability to identify evidence supporting one's beliefs and a

proclivity to act on those beliefs, may then be reflected in the phenomenology of that person's psychosis. Delusional phenomenology, including the tendency to act on delusions, may simply reflect the subject's previous personality.

The second prediction was that the phenomenological correlates of action would be stable over time. This was partly confirmed. When the subjects were interviewed for a second time those correlates of action which related to the ability to identify evidence were largely lost. With regard to the affective components of the Principal Belief, however, in addition to the correlations with feeling unhappy, frightened and anxious which were noted on the first interview, subjects who acted on their Principal Belief were more likely to report feeling angry as a consequence of that belief.

These results do not contradict the suggestion that delusional action can be seen as driven by a belief and an affect and triggered by things which the deluded person notices in his or her environment. These triggers are likely to be transitory phenomena: there is no reason to suppose that they will persist for long after the action has taken place. The interval between the action and the eliciting of the phenomenology was longer in the case of the second interview and the passage of time may have altered this element of the phenomenology. Interestingly, in relation to

the argument put forward above relating to the reasons for seeking information, the association with changing one's level of conviction in response to a challenge is also lost. As the belief generates less doubt, so information may be sought less keenly and the urge to act felt less acutely.

The findings in relation to the second interview do suggest, however, that not all of the results reported here can be attributed to the subject's personality. If such was the case, one might have expected all of the phenomenological correlates of action to remain stable. With regard to the ability to identify evidence in support of one's belief, this did not happen. This aspect of acting on delusions would seem to be dependent on the subject's mental state. The possibility remains, however, that those correlates of delusional action which show more temporal stability, correlates such as the affective component of the belief, are correlated not with the presence of delusions but with aspects of personality.

The third prediction was that the phenomenology of acting on delusions would be independent of the content of those delusions. This was tested in two ways, first, by identifying the phenomenological correlates of persecutory Principal Beliefs independently and then by examining the correlates of action in the presence of persecutory delusions. The phenomenological correlates of action were

generally similar whether or not the Principal Belief was persecutory. When the effect of the presence of persecutory delusions was examined, however, the phenomenological correlates of action, noted above, were maintained when persecutory delusions were present and lost when they were not.

One possibility is that this is due to the numbers in the various groups. Of those subjects for whom interview data were available relating to belief maintenance factors, 50 described persecutory delusions while only 28 failed to do so. Even if the effect of, say, a positive response to the question, "Do you at present (or have you in the past month) looked for any evidence or information either to confirm your view or to test whether it may be mistaken?" was the same whether or not a persecutory delusion was present, the smaller sample size for the group with no persecutory delusions might be preventing the effect of a positive response from reaching statistical significance.

This appears not to be the case. Table 5.2.2. shows the responses of subjects to item 2.5 of Appendix 1. The figures for subjects who described persecutory delusions are shown in bold and those for subjects with no such delusions are in normal type.

Table 5.2.2. Association between seeking information to confirm or refute a delusion and acting on that delusion (P+ = persecutory delusion present, P- = persecutory delusion absent).

	Actors (%)	Non-actors (%)
Search made (P+)	11 (69)	5 (15)
Search made (P-)	2 (29)	4 (19)
No search made (P+)	5 (31)	29 (85)
No search made (P-)	5 (71)	17 (81)
Total (P+)	16 (100)	34 (100)
Total (P-)	7 (100)	21 (100)

The lack of statistical significance in the absence of persecutory delusions is not simply the product of small numbers. Not only is the proportion of actors searching for information reduced, the effect of seeking information is reversed. Whereas in the presence of persecutory delusions most actors seek information, in the absence of such delusions most fail to do so.

The situation is similar with regard to affective content. Here, again, the phenomenological correlates, noted on

examination of the whole sample, were present only for those subjects who described persecutory delusions. Is the lack of such an association for those subjects who failed to describe persecutory delusions due to small numbers? It would appear not. In Table 5.2.3, the affective content of the Principal Belief is shown in bold for subjects with a persecutory delusion (P+) and in normal type for those without (P-).

Table 5.2.3. Association between feeling frightened as a result of a delusion and acting on that delusion (P+ = persecutory delusion present, P- = persecutory delusion absent).

	Actors (%)	Non-actors (%)
Frightened (P+)	15 (94)	16 (47)
Frightened (P-)	4 (57)	10 (45)
Not frightened (P+)	1 (6)	18 (53)
Not frightened (P-)	3 (43)	12 (55)
Total (P+)	16 (100)	34 (100)
Total (P-)	7 (100)	22 (100)

When persecutory delusions are present, subjects who act on their delusions are almost always frightened by them. When

persecutory delusions are absent, actors are only slightly more likely than non-actors to feel afraid.

The final area in which the phenomenology of delusions was associated with action in the presence of persecutory delusions but not in their absence was insight. In response to the question, "Asking you to think about it now, can you think of anything at all that has happened that goes against your belief?" subjects with persecutory delusions were significantly more likely to think of evidence if they were actors and not to think of evidence if they were not (see Table 4.4.16). The same did not apply in the absence of persecutory delusions. Is the lack of a statistically significant association in the group without persecutory delusions simply due to the smaller numbers in that group? Again, in Table 5.2.4, the two groups are tabulated together, with the data from those subjects with persecutory delusions shown in bold.

Table 5.2.4. Association a positive response to the question "Asking you to think about it now, can you think of anything at all that has happened that goes against your belief?" and acting on that belief (P+ = persecutory delusion present, P- = persecutory delusion absent).

	Actors (%)	Non-actors (%)
Think of anything (P+)	7 (44)	5 (15)
Think of anything (P-)	2 (29)	6 (27)
Think of nothing (P+)	9 (56)	29 (85)
Think of nothing (P-)	5 (71)	16 (73)
Total (P+)	16 (100)	34 (100)
Total (P-)	7 (100)	22 (100)

The lack of a statistically significant association between being able to think of evidence contradicting the Principal Belief, on the one hand, and acting on that belief, on the other, in subjects without persecutory delusions does not appear to be a product of small numbers. In the presence of persecutory delusions almost half (44%) of the actors were able to think of evidence whereas it was rare for non-actors to be able to do so (only 15% could). In the absence of persecutory delusions the proportion of actors who were able

to think of such evidence (29%) was almost identical to the proportion of non-actors who were able to do so (27%).

The phenomenological correlates of delusional action appear to be different according to whether or not persecutory delusions are present. This effect does not seem to be accounted for by the fact that, in this study, the great majority of subjects demonstrated persecutory beliefs and the numbers in the persecution-free group were small. Nor is the effect due to persecutory beliefs themselves being acted upon differently: it has been shown here that the phenomenological correlates of action are similar for persecutory and non-persecutory Principal Beliefs. Somehow the presence of persecutory delusions alters the way in which other beliefs are acted upon. How could this be?

It is easiest to suggest an explanation for the finding that, in the presence of persecutory delusions, the effect of being able to identify evidence is more pronounced. After all, the significance of any evidence which is observed is likely to appear greater when one feels under threat. It is less easy to explain why the affective components of a belief should cease to be associated with action in the absence of persecutory delusions although, again, it could be argued that the effect of any change in mood will be more pronounced when someone feels persecuted and, perhaps, aroused. Finally, with regard to insight, it may be that the

effect, suggested above, whereby those who doubt the veracity of their delusions are more likely to notice evidence in support of those delusions and act when such evidence appears, may be more pronounced in the presence of persecutory beliefs.

The fourth prediction was that the phenomenology of action would be independent of the nature of that action. The latent class analysis of self-reported action suggested that the subjects could be divided into three groups. One of these contained subjects who had acted aggressively and another contained those who defended themselves. It was hoped to compare the phenomenological correlates of aggressive and defensive action. This was not possible because of the small numbers in each group.

McGinn (1979) has proposed a model, described here, to explain actions consequent upon normal beliefs. The findings of this study suggest that action consequent upon delusions may be generated in the same way. Firstly, it is McGinn's view that actions are the product of desires and beliefs. This study shows that action consequent upon a delusion is more likely when that delusion is affectively charged and that this is a relatively stable phenomenon. Secondly, McGinn holds that actions are triggered by "noticings". This study showed that delusional action is more likely when the subject can identify evidence supporting his or her belief

and that this is a relatively transitory phenomenon.

6. Summary

The study consisted of the examination of the phenomenological correlates of acting on delusions in a sample of 83 newly admitted psychotic subjects who demonstrated at least one non-mood congruent delusion. Subjects were screened to identify such beliefs using the P.S.E. and where several delusions were present one belief was selected for further study. This was termed the Principal Belief. Each subject was then interviewed using a newly designed instrument, the Maudsley Assessment of Delusions Schedule, in order to describe the phenomenology of the Principal Belief. Several areas of phenomenology were examined, namely, the degree of conviction with which the belief was held, the presence or absence of evidence supporting the belief, the affective content of that belief, its systematisation, the level of pre-occupation present and the level of insight demonstrated by the subject. In addition, information was obtained relating to two behavioural variables, one derived from the subject's own description and the other generated from information provided by informants.

The phenomenological correlates of action defined in these two ways were then examined. When action was defined on the basis of information provided by informants, no such

correlates were identified. It seems most likely that this reflects the lack of validity of the behavioural variable. When action was defined on the basis of information provided by the subjects themselves, several aspects of phenomenology were associated with such action. In particular, the ability to identify evidence supporting the belief, the presence of an affective component to that belief and the presence of a form of insight (a willingness, when challenged, to change the degree of conviction with which the belief was held) showed such an association.

Further investigation showed that some of these associations were stable over time. When the subjects were interviewed again, three to five days later, the presence of an affective component to the delusion was again correlated with that delusion being acted upon; the associations with the ability to identify evidence and with insight were lost. Further investigation also suggested that the correlates of action identified here are independent of the usual categorisation of delusions according to their content: the findings were applicable both to persecutory and to non-persecutory delusions. It does seem, however, that content is important in another sense. The phenomenological correlates of action, described here, were largely lost when a full examination of the subject's mental state revealed no evidence of persecutory delusions.

7. References

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Appendix 1

Items from the Maudsley Assessment of Delusions Schedule employed in this study: measures of inter-rater reliability

The complete instrument takes the form of a semi-structured interview and associated instructions. Inter-rater reliability was measured as part of the testing of the instrument. Where more than two ratings were available for an item the inter-rater reliability is described as a weighted Kappa co-efficient; where only two ratings were available it is described as an unweighted Kappa.

Item	Number of ratings available	Inter-rater reliability
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1. Conviction

1.1 How sure are you about X?	5	0.84
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2. Belief maintenance factors

Can you now explain why you continue to think that X is so?

Has anything happened since the
idea first came to you?

2.1	Events/States since formation	2	1.0
2.2	Events/states in last week	2	0.78
2.3	Internal state maintaining belief (e.g. mood, abnormal experience)	2	0.59
2.4	External events maintaining beliefs	2	0.75
2.5	Do you at present (or have you in the past month) looked for any evidence or information either to confirm your view or to test whether it may be mistaken?	2	0.73

3. Affect relating to chosen belief

How does the belief make you
feel? Does it make you feel:

3.1	Happy or elated?	2	0.71
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3.2	Unhappy or miserable?	2	0.88
3.3	Frightened?	2	0.92
3.4	Anxious?	2	0.83
3.5	Angry?	2	0.92

4. Action

Does X make you do anything in particular?

4.1	Have you talked to anyone about X?	3	0.77
4.2	Have you written to anyone?	3	1.0
4.3	Have you tried to stop X happening?	3	0.91
4.4	Have you tried to protect yourself in any way?	3	0.75
4.5	Does X make you lose your temper?	3	0.79

4.6	Have you ever broken anything because of this?	3	0.94
4.7	Have you felt like hitting someone because of it?	3	0.87
4.8	Have you hit anyone because of it?	3	0.81
4.9	Do you know the person/people you have/may have harm(ed)?	3	0.79
4.10	Have you tried to harm yourself or harmed yourself accidentally because of X?	3	0.91
4.11	Have you tried to move or leave your house because of X?	3	0.86
4.12	Have other changes resulted?	3	0.59
For those hearing voices only:			
4.13	Do the voice(s) tell you to do anything?	3	1.0
4.14	Do you have to obey?	3	0.85

4.15 Do you do anything to escape them?	3	1.0
Has X stopped you from doing things you would normally have done?		
4.16 Has X stopped you from meeting friends?	3	0.72
4.17 Has X stopped you from watching T.V.?	3	0.91
4.18 Has X stopped you from eating or drinking anything?	3	0.82
4.19 Has X stopped you from using transport?	3	0.78
4.20 Has X stopped you from going to work?	3	0.70
4.21 Has X stopped you from taking medication?	3	0.65
4.22 Has X stopped you from going to hospital/your doctor on an out		

patient basis?	3	0.79
4.23 Is there anything else which X has stopped you from doing?	3	1.0
5. Preoccupation	4	0.62
6. Systematization	3	0.58
7. Insight		
7.1 Are you psychologically unwell in any way ... is there anything wrong with your nerves?	3	0.84
7.2 Do you think that seeing a psychiatrist might help you (has helped you) in any way?	3	0.79
7.3 Do you think that medication might help you (has helped you) in any way ... how?	4	0.90

7.4	Let me suggest something hypothetical to you- something that does not fit with your view and you could tell me how you think you would react.	4	0.90
7.5	Asking you to think about it now - can you think of anything at all that has happened that goes against your belief?	2	0.75
7.6	When you think about it now is it at all possible that you are mistaken about X?	2	0.91
7.7	What would have to happen to make you think that you might be wrong about X?	3	0.62
7.8	How far do you think others share your beliefs?	5	0.88
7.9	Do you ever discuss your ideas with others?	2	0.83

- 7.10 Do you ever have arguments about
your beliefs? 5 0.89
- 7.11 Earlier I asked you whether or not
you felt others shared your
belief about X. I'd like to
clarify whether you feel that
other people also believe X-
either openly, or perhaps
without talking about it? 3 0.78

Appendix 2

Informant interview

"We are interested to know whether X behaved in ways that seemed to you either odd, unusual, disturbing or in any way out of the ordinary during the past month. We are interested in what X actually did, as well as the possible reasons for it."

1. Behaviour in the home

1.1 Has anything he/she heard on television, radio or in the newspapers, during the past month, seemed to give rise to any odd or unusual behaviour or distress?

(Can you give me an example ?)

(How often has that sort of thing occurred ?)

(What do you think was the reason for the behaviour?)

1.2 Has X been writing letters or making phone calls to unusual people ?

1.3 Has X been feeling unsafe, frightened or scared at home?

If so, has X been taking extra precautions, such as locking the door or putting a chain on the door ?

1.4 Has there been any change in X's eating and drinking habits?

Has he been refusing food or drink ?

1.5 Has X been dressing in an unusual, inappropriate or different way?

1.6 Has X been behaving in the house in any other different or unusual ways?

2. Behaviour to others

2.1 Has X been suspicious of people recently ? If so, how has this been shown? Has X been checking on anyone, or jealous of anyone?

3. Violent behaviour (against people). Do not rate verbal threats.

3.1 Has X been violent to anyone? Who? In what way was he violent? Did he use a weapon? Was there any injury?

4. Antisocial behaviour (against property)

4.1 Has X damaged anything, either inside or outside the home? What has been damaged?

4.2 Has X been doing anything else likely to get him/her into trouble?

5. Behaviour towards self

5.1 Has X tried to harm himself/herself ?

6. Behaviour outside the home

6.1 Has X contacted the police? Has X contacted anyone else in authority, such as lawyers, M.P.s?

6.2 Has X been worried about his health? Has he visited his doctor or a hospital?

6.3 Has X attended any new meetings or joined any new organisations?

6.4 Has X been spending money in an extravagant or unusual way?

If so, what on?

7. Behaviour at work

7.1 Has X been working during the last month? Do you know if X behaved in any new, unusual or odd ways whilst at work?

8. Religious behaviour

8.1 Does X have any strong religious views ? Has he attended church recently?

Has X developed any new religious beliefs?

Has he done anything because of his beliefs?

9. Other

9.1 Has X done anything else unusual, odd or new in the last month that you haven't already mentioned?

Any positive answers were probed further, and a full description of the behaviour, its frequency and any possible motives obtained.

Frequency was rated as follows.

0= did not occur

1= one of these behaviours definitely occurred on at least one occasion, but no evidence anything but rare.

2= occurred more than once but not frequently (i.e. not more than five or more times).

3= occurred frequently (e.g. at least five times)./

4= present more or less continuously (at least every day).

Appendix 3

Table of Results

Key

- Item** Item from Appendix 1. See page 208.
- A** Correlates of acting on delusions when action is defined by subjects themselves. See page 69.
- B** Correlates of acting on delusions when action is defined on the basis of information provided by informants. See page 84.
- C** Correlates of acting on delusions (subject defined) at second interview. See page 89.
- D** Correlates of acting on delusions (informant defined) at second interview. See page 96
- E** Correlates, at first interview, of subject-defined action when the Principal Belief is a delusion of persecution. See page 101.
- F** Correlates, at first interview, of subject-defined action when the Principal Belief is not a delusion of persecution. See page 101.
- G** Correlates, at first interview, of subject-defined action when subject describes a delusion of persecution. See page 115.
- H** Correlates, at first interview, of subject-defined action when subject does not describe a delusion of persecution. See page 115.
- No statistically significant association.
- 1 Non-significant trend ($0.05 < p < 0.1$).
- 2 Statistically significant association ($p < 0.05$).
- * No test of association possible.

Appendix 4

Items from the Maudsley Assessment of Delusions Schedule employed in this study: measures of agreement between responses at first and second interview.

Where more than two ratings were available for an item the level of agreement is described as a weighted Kappa coefficient; where only two ratings were available it is described as an unweighted Kappa.

Item	Number of ratings available	Measure of agreement
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1. Conviction

1.1 How sure are you about X?	5	0.56
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2. Belief maintenance factors

Can you now explain why you continue to think that X is so?
Has anything happened since the idea first came to you?

2.1	Events/States since formation	2	0.86
2.2	Events/states in last week	2	0.72
2.3	Internal state maintaining belief (e.g. mood, abnormal experience)	2	0.48
2.4	External events maintaining beliefs	2	0.83
2.5	Do you at present (or have you in the past month) looked for any evidence or information either to confirm your view or to test whether it may be mistaken?	2	0.81

3. Affect relating to chosen belief

How does the belief make you
feel? Does it make you feel:

3.1	Happy or elated?	2	0.91
3.2	Unhappy or miserable?	2	0.89

3.3	Frightened?	2	0.77
3.4	Anxious?	2	0.84
3.5	Angry?	2	0.79

4. Action

Does X make you do anything in particular?

4.1	Have you talked to anyone about X?	3	0.55
4.2	Have you written to anyone?	3	0.45
4.3	Have you tried to stop X happening?	3	0.62
4.4	Have you tried to protect yourself in any way?	3	0.73
4.5	Does X make you lose your temper?	3	0.51
4.6	Have you ever broken anything because of this?	3	0.73

4.7	Have you felt like hitting someone because of it?	3	0.65
4.8	Have you hit anyone because of it?	3	0.69
4.9	Do you know the person/people you have/may have harm(ed)?	3	0.73
4.10	Have you tried to harm yourself or harmed yourself accidentally because of X?	3	0.36
4.11	Have you tried to move or leave your house because of X?	3	0.43
4.12	Have other changes resulted?	3	0.42
For those hearing voices only:			
4.13	Do the voice(s) tell you to do anything?	3	0.59
4.14	Do you have to obey?	3	0.70
4.15	Do you do anything to escape them?	3	0.48

Has X stopped you from doing things you would normally have done?

4.16	Has X stopped you from meeting friends?	3	0.61
4.17	Has X stopped you from watching T.V.?	3	0.50
4.18	Has X stopped you from eating or drinking anything?	3	0.51
4.19	Has X stopped you from using transport?	3	0.57
4.20	Has X stopped you from going to work?	3	0.57
4.21	Has X stopped you from taking medication?	3	0.73
4.22	Has X stopped you from going to hospital/your doctor on an out patient basis?	3	0.68

4.23 Is there anything else which X has stopped you from doing?	3	0.73
5. Preoccupation	4	0.55
6. Systematization	3	0.72
7. Insight		
7.1 Are you psychologically unwell in any way ... is there anything wrong with your nerves?	3	0.56
7.2 Do you think that seeing a psychiatrist might help you (has helped you) in any way?	3	0.57
7.3 Do you think that medication might help you (has helped you) in any way ... how?	4	0.56
7.4 Let me suggest something hypothetical to you- something		

that does not fit with your view and you could tell me how you think you would react.	4	0.42
7.5 Asking you to think about it now - can you think of anything at all that has happened that goes against your belief?	2	0.84
7.6 When you think about it now is it at all possible that you are mistaken about X?	2	0.81
7.7 What would have to happen to make you think that you might be wrong about X?	3	0.47
7.8 How far do you think others share your beliefs?	5	0.55
7.9 Do you ever discuss your ideas with others?	2	0.46
7.10 Do you ever have arguments about your beliefs?	5	0.67

7.11 Earlier I asked you whether or not you felt others shared your belief about X. I'd like to clarify whether you feel that other people also believe X- either openly, or perhaps without talking about it?

3

0.52

Appendix 5

Published papers

Acting on Delusions. II: The Phenomenological Correlates of Acting on Delusions

ALEC BUCHANAN, ALISON REED, SIMON WESSELY, PHILIPPA GARETY, PAMELA TAYLOR, DON GRUBIN and GRAHAM DUNN

The aim of the study was to identify the phenomenological characteristics of those delusions which are associated with action. The sample consisted of 79 patients admitted to a general psychiatric ward, each of whom described at least one delusional belief. The variables studied included the phenomenology of the delusions, and behaviour. Two behavioural ratings were used, one derived from the subjects' own description of their behaviour and the other from information provided by informants. There was no association between delusional phenomenology and acting on a delusion when the subjects' behaviour was described by informants. When action was described by the subjects themselves, acting was associated with: being aware of evidence which supported the belief and with having actively sought out such evidence; a tendency to reduce the conviction with which a belief was held when that belief was challenged; and with feeling sad, frightened or anxious as a consequence of the delusion.

The previous paper (this issue) reported some of the links between delusional beliefs and behaviour. That consistent associations are difficult to find between behaviour and different types of delusions is not surprising. Categories such as 'persecutory' and 'religious' are not mutually exclusive and provide little information with regard to the overall significance of the belief for the patient.

Little has been written on the phenomenological correlates of delusions which are associated with action, and such literature as does exist pertains mostly to violence. Thus Hafner & Boker (1973) found a correlation between the degree of systematisation of a delusional belief and the likelihood of its being acted upon in a violent manner. The importance of affect in determining behaviour in the context of psychosis was recorded by Bleuler (1924); more recently Shore (1979) has argued that flattening of affect allows schizophrenic people to injure themselves as a consequence of their delusions. Roback & Abramowitz (1979) found behavioural adjustment to correlate with insight in psychosis but the measures of behaviour were general, the delusions unrecorded, and the implications for delusional action unclear.

The present study is an attempt to investigate the links between delusional beliefs and action through a more detailed phenomenological assessment of the beliefs than has previously been described.

Method

The sample was based on that described in the previous paper, which consisted of 83 psychotic in-patients with at least one delusion according to PSE criteria.

The variables studied consisted of aspects of the phenomenology of delusions and measures of behaviour. Delusions were identified using the PSE; where more than one delusion was present, the subject was asked to state which was most important to him/her, and this was termed the 'principal' belief. The subject was then asked a series of questions relating to the phenomenology of this belief. These questions are contained in the Maudsley Assessment of Delusions Schedule (MADS) (see previous paper, Appendix 1). The subject was questioned regarding behaviour consequent on the principal belief in the past month, and further information was obtained from informants.

Subjects were asked how sure they were about the truth of their delusional belief, and their responses were rated from zero ('doubt it') to four ('absolutely certain').

Subjects were asked why they continued to believe their delusional beliefs. They were asked whether internal events (such as mood changes) or external events had occurred at any time since the idea first came to them, or in the last week. Finally, they were asked whether they actively sought information to confirm or refute their belief.

Subjects were asked whether the delusional belief in question made them feel elated, unhappy, frightened, anxious or angry.

Preoccupation was rated on a scale of 0 to 4 according to the criteria used in the PSE.

Systematisation was rated on a scale from 0 to 3 according to the criteria used in the PSE.

Subjects were also asked whether they felt that others shared their belief, what would have to happen to make them think that they were wrong, whether they regarded themselves as unwell, and whether taking medication or seeing a psychiatrist had helped in any way. Finally, subjects were presented with a 'hypothetical contradiction' to their delusional belief. Thus a patient who believed that other people controlled his actions using radio waves was told by the interviewer that there was no mechanism whereby

this could happen. The subject's responses were scored according to whether he ignored the contradiction or denied its relevance, accommodated it into his delusional system ("But you're only saying that because they want you to"), lessened his conviction in his belief, or abandoned his belief completely.

As reported in Paper I, a latent class analysis of subjects' responses had generated three groups of patients: those who acted not at all or very little on their delusions; those who acted aggressively, and those who acted in a defensive manner.

Pronounced formal thought disorder limited the amount of information which could be obtained in a few cases. With regard to affect and insight, data were available for 79 subjects. With regard to the other phenomenological variables, data were available for 78 subjects.

Statistical analysis

This was conducted by the authors using the SPSS/PC + version 3.0 (1989). Statistical associations were tested using the χ^2 statistic. Where cell sizes rendered this unreliable, the association was confirmed by an exact test using the EGRET (1990) programme.

Results

When behaviour was rated by informants, no statistically significant associations were found between aspects of delusional phenomenology and action. In assessing the phenomenological correlates of action when that action was defined by the patient, the sample was divided using the latent class analysis described above. Patients who failed to act on their delusions or who acted very little ('non-actors') were compared with those who acted in an aggressive or defensive manner ('actors').

When the levels of conviction of actors and non-actors were compared, no statistically significant differences were found.

When patients were asked why they believed their delusions, 42 described evidence from external events (36 failed to do so) and 15 described evidence in the form of internal events such as mood changes or hallucinations (63 failed to do so). There was no statistically significant association between describing external or internal evidence in isolation and acting on a delusion. When subjects were asked whether either type of evidence existed, an association was found with acting on the delusion as shown in Table 1. When subjects were asked whether either type of evidence had been apparent in the past week a similar association was found ($\chi^2 = 9.17$, d.f. = 1, $P < 0.003$). When subjects were asked whether they sought out evidence to confirm or refute their belief, an association was again found with acting on that delusion (Table 1).

When subjects were asked whether their delusional belief made them feel elated or angry, no associations were found with acting on that delusional belief. Associations were found with feeling frightened (Table 1) and feeling sad ($\chi^2 = 6.44$, $P < 0.02$). Feeling anxious was also associated with action ($\chi^2 = 8.62$, $P < 0.004$) but the covariance with feeling frightened was high.

Table 1
Associations between the ability to identify evidence (internal or external) supporting the delusional belief and with acting on the delusion

	No. (%) of actors	No. (%) of non-actors
Ability to identify evidence supporting belief		
present	23 (100)	46 (83.6)
absent	0 (0)	9 (16.4)
total	23 (100)	55 (100)
	$\chi^2 = 4.25$, $P < 0.04$	
Seeking information to confirm or refute belief		
search made	13 (56.5)	9 (16.4)
no search made	10 (43.5)	46 (83.6)
total	23 (100)	55 (100)
	$\chi^2 = 12.92$, $P < 0.001$	
Feeling frightened as a result of the belief		
feel frightened	19 (82.6)	26 (46.4)
does not feel frightened	4 (17.4)	30 (53.6)
total	23 (100)	56 (100)
	$\chi^2 = 8.71$, $P < 0.004$	
Reaction to hypothetical contradiction		
ignores contradiction	9 (39.1)	45 (80.4)
accommodates into system	1 (4.3)	0 (0)
changes conviction	12 (52.2)	8 (14.3)
dismisses delusion	1 (4.3)	3 (5.4)
total	23 (99.9)	56 (100.1)
	$\chi^2 = 15.77$, d.f. = 3, $P < 0.002$	

No associations were found between preoccupation with, or systematisation of, a delusional belief and the likelihood of that belief being acted upon.

No association was found between any of the general measures of insight used and the likelihood of the patient's delusional belief being acted upon. When subjects were presented with a hypothetical contradiction to their delusional belief, an association was found between their answers and the likelihood of them acting on that delusion (Table 1).

Non-significant trends towards an association with action were noted for some items relating to insight ("Are you psychologically unwell . . .?", "Do you think that medication might help you?") but not for others ("Do you think that seeing a psychiatrist might help you . . .?", "How far do you think others share your belief?").

Further statistical analysis

As part of the testing of the MADS all subjects were reinterviewed three to five days after the collection of the data presented above. The same questions were asked concerning the phenomenology of the principal belief. The data from this second interview were analysed to test for associations with delusional action as defined above. The

associations with action were maintained for the affective features ($P < 0.02$ for feeling sad, $P < 0.01$ for feeling frightened, and $P < 0.02$ for feeling anxious). With regard to the response to a hypothetical contradiction, a similar trend was noted to that shown in Table 1, but this failed to reach statistical significance. With regard to the ability to identify information supporting the delusional belief and actively seeking such information, the associations with acting were not maintained.

An attempt was made to compare the two groups of 'actors' identified by latent class analysis, namely, those who acted predominantly aggressively and those whose actions were generally defensive. The numbers were small (14 and 9) and no significant differences were noted between the two groups.

In Paper I we suggested that delusions of persecution are associated with action while delusions of catastrophe show an inverse association. The associations noted above were tested for delusions of persecution alone and for all other delusions. Small numbers prevented the same process from being followed for delusions of catastrophe. For delusions of persecution ($n = 24$), the associations noted above generally were maintained with the exception that feeling sad as a consequence of a delusion was no longer associated with action. For all other delusions ($n = 55$ for affect and insight, $n = 54$ for all other variables) the associations were again generally maintained with two exceptions: feeling frightened as a consequence of a belief and the ability to identify information supporting the belief were no longer associated with action. The association with being able to identify evidence apparent in the past week was maintained, as were the other associations noted above.

Discussion

When the testimony of informants was used to define action, there was no association between aspects of delusional phenomenology and the likelihood of that delusion being acted upon. This contrasts with the positive findings noted when action is defined by the subject him/herself. The discrepancy has been discussed in Paper I.

When the definition of action is based on the subject's own description of his/her behaviour, an ability to identify evidence, in particular evidence in the past week, which supports the belief is associated with action. Seeking information to confirm or refute a delusional belief is strongly associated. Emotional consequences of the belief, such that subjects describe feeling sad, frightened or anxious, show a similar association, as does losing one's conviction in the face of a hypothetical contradiction. Aspects of phenomenology not associated with action in this study were conviction, preoccupation, systematisation, and insight, as well as the emotional consequences of anger and elation.

Action is a more likely consequence of a delusional belief if the subject can identify evidence in support of that belief; this finding is not simply a reflection of intellectual function (Paper I). It is consistent with the view of McGinn (1979) that action is based on a combination of desires and beliefs and triggered by 'noticings', internal or external cues which precipitate action. The findings of the study suggest that these 'noticings' are a far from passive experience; action is rendered much more likely where a subject actively seeks evidence to confirm or refute a belief. The findings also raise the possibility that some acting on delusional beliefs may be the result of the subject testing beliefs in an attempt to confirm or refute them. This interpretation would in turn be supported by the finding (see below) that acting on a delusion is more likely when the subject is able to countenance evidence which contradicts that belief.

The finding that emotions such as unhappiness, fear and anxiety, when found as a consequence of a delusion, are associated with action is consistent with Bleuler's view (1924) that action is largely a consequence of affectivity. The willingness of patients who act on their delusions to countenance hypothetical contradiction of their delusional beliefs is perhaps surprising; it might have been expected that patients who ignored contradiction would be more likely to act. It is consistent, however, with the findings that conviction and systematisation are not associated with action and with the suggestion that action is more likely when beliefs are questioned and evidence is sought to confirm or refute them.

Previous studies have found an association between the ability to countenance a hypothetical contradiction and recovery from delusions. Brett-Jones (1987) found this in subjects being treated with psychotropic medication; Chadwick & Lowe (1990) found that drug-resistant subjects who were able to countenance a contradiction to their delusional beliefs responded better to cognitive behavioural therapy than those who were not so able. They also found that noticing actual evidence contradicting the belief was associated with recovery. We have found that a positive response to a hypothetical contradiction is associated with acting on delusional beliefs. These findings raise the possibility that acting on delusional beliefs, particularly where that action is designed to test out the validity of the belief, is itself related to recovery; this issue is worth further investigation.

That the associations between the ability to identify information supporting a delusional belief and acting on that belief were not maintained when the subjects were reinterviewed three to five days

later may suggest that the questions used to elicit this information were unreliable. The inter-rater reliability was good, however, and the findings are consistent with each other. It is more likely that the ability to identify information supporting a delusional belief is a genuine but transient element of the phenomenology. The affective connotations of a belief, on the other hand, would seem to be more stable over time. It is possible that an affect-laden delusional belief is acted upon only when the subject perceives certain information which seems to bear out that belief; again, this is consistent with the theoretical work of McGinn (1979).

There remains the question of the degree to which these associations are independent of phenomenological categories based on content of the delusion, categories examined in Paper I. When persecutory content was controlled for, the associations described above were maintained. The results suggest that the associations we have described are independent of phenomenological categories based on content. One exception may concern feeling frightened as a result of a delusion, which is associated with action for delusions of persecution but not for other delusions.

Of the negative findings, the effect of conviction has already been mentioned. The lack of an association between action and elation may shed some light on the apparent low incidence of violence in manic patients (Schipkowsky, 1968). The lack of an association between systematisation and insight and action might be considered surprising in view of previous findings (Hafner & Boker, 1973; Roback & Abramowitz, 1979). Methodological differences make direct comparisons with these studies difficult. Hafner & Boker's study was limited to offender patients, and Roback & Abramowitz used only general measures of behaviour and did not attempt to measure behaviour arising as a consequence of specific delusional beliefs.

Recent writing on the subject of insight has included the description of phenomenological 'dimensions' (David, 1990). The non-significant trends which we report suggest that some of these dimensions (e.g. ability to recognise illness) are more strongly associated with action than others (e.g. the ability to relabel as abnormal unusual mental events).

Further research could usefully test associations between delusions and actions based upon them in a prospective study. Research on larger patient populations may also be able to identify phenomenological differences in the delusional beliefs of aggressive and defensive 'actors'.

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Acting on delusion: a review

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SYNOPSIS The paper reviews the link between delusional beliefs and behaviour. The literature pertaining to the link between normal beliefs and behaviour is briefly examined, emphasizing the predominance of psychological and philosophical contributions to the topic. The psychiatric literature describing actions consequent upon delusional beliefs is then reviewed. In conclusion, those aspects of psychosis, distinct from delusional beliefs themselves, which may affect the likelihood of a given belief being acted upon, are discussed.

INTRODUCTION

Do psychotic patients act on their delusions? Through the years many authors have thought not. Otto Kant (1927) (quoted by Schmidt, 1940) noted that deluded patients frequently failed to act in accordance with their views. Hemsley & Garety (1986) wrote that in deluded subjects 'one frequently striking feature is their remarkable lack of action congruent with apparently sincerely held beliefs'. In 1923 Jaspers reported that 'the attitude of the patient to the content of his delusion is peculiarly inconsequent at times'. An apparently inconsequential attitude does not necessarily imply a failure to act, however, and may simply render the prediction of any action more difficult. Studies of mental illness and crime have suggested that delusional beliefs can affect behaviour. Gibbens (1958) reviewed 115 cases of homicide admitted to New Jersey State Hospital and found that one-third of insane murderers had well-structured delusional motives for their crimes. Lanzkron (1963) reported that 40% of insane homicides occurred 'as offspring of a delusional system'. Taylor (1985), interviewing a remand prison population, considered that 46% of psychotic men were driven to offend by their psychotic symptoms.

A small literature exists concerning delusional motivation for schizophrenic stereotypies (Mayer Gross *et al.* 1960) and hospital at-

tendance (Hutchesson & Volans, 1989). For the most part, however, delusional motives for actions tend to be reported only when those actions lead to distress or suffering on the part of the patient or others. Thus, delusional motivation has been described in episodes of violence, in other criminal activity and in the context of self-harm. More mundane instances of action based on delusions are seldom reported and this bias has to be considered when conclusions are drawn from such reports as do exist.

This essay will first discuss the role of normal beliefs in determining behaviour. While essential to the discussion which follows, this is not an area which has been extensively examined by psychiatric researchers and debate has focused principally on information drawn from the fields of psychology and philosophy. The second part of the paper will review the various types of delusional belief which have been implicated in behaviour. Among the many factors affecting the likelihood of a psychotic patient acting on a delusional belief, factors such as personality and previous experience, will be elements of the psychosis distinct from the belief itself, elements such as perceptual changes, insight, motor changes and cognitive functioning. These elements will be reviewed in the third part of the paper.

Finally, mention must be made of what will not be discussed. A considerable literature now exists pertaining to the nature of delusions. Principal components analyses by workers such as Kendler *et al.* (1983) and Garety & Hemsley (1987) have identified dimensions such as con-

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viction and preoccupation. These dimensions bear some similarity to the criteria for delusional beliefs described by workers such as Kräupl-Taylor (1983). It might be expected that each of these dimensions would affect substantially the likelihood of a belief being acted upon but, to the author's knowledge, no research has been conducted in this area. For the purposes of this paper, the definition of delusion will follow the criteria suggested by workers such as Mullen (1979) and Kräupl-Taylor (1983), namely, that they are false beliefs, held with conviction and regarded by the subject as self-evident which are not amenable to reason and inherently unlikely in content.

THEORETICAL CONSIDERATIONS

A review of the link between abnormal beliefs and behaviour demands some discussion of the role of normal beliefs in the genesis of action. In the 1940s and 1950s the early behaviourists (e.g. Hull, 1943; Guthrie, 1952) opposed the then widespread notion that action must be explained in terms of purpose. They argued that human behaviour could be better explained in terms of 'receptor impulses' and 'movements'. The elucidation of these 'primary principles' would in turn allow a rigorous definition of terms such as 'purpose' and 'intention'. In the words of Hull:

The present approach does not deny the motor reality of purposive acts (as opposed to movements), of intelligence, of insight, of goals, of intents, of stirrings or of value; on the contrary, we insist upon the genuineness of these forms of behaviour. We hope ultimately to show the logical right to the use of such concepts by deducing them as secondary principles from more elementary objective primary principles (pp. 25-26).

While beliefs are clearly important if behaviour is to be explained in terms of purpose, their role is less clear when this behaviour is explained in terms of 'primary principles'. Hull was clear that purposive behaviour could be derived from postulates involving only 'stimulus' and 'movement'. The role of goal directed thought was similarly dismissed by Guthrie (1952) who suggested that thinking, like action, was a product of conditioning and tended to occur when action was blocked. These authors aspired to a science which was more rigorous and quantitative. As Hull wrote in 1951:

the continuous quantitative use of relevant postulates

and corollaries will hasten the elimination of errors and the day when mammalian behaviour will take its place among the recognised quantitative systematic sciences (p. 2).

But it was not the advocacy of a rigorous scientific method which concerned other authors, rather the theory which lay behind the writings of Guthrie and Hull. Keith Campbell (1970) noted that behaviourists had placed 'the mind' not behind an action but in the behaviour itself and hence, worryingly for a philosopher, omitted the causal element in mental concepts. In the second half of the twentieth century philosophers' arguments have followed two related themes, both of which allow a pivotal role for belief in the explanation of action. The first has been expanded by Papineau (1978) who argues that the reasons behind an action involve, first, a desire and, secondly, a belief that the action will contribute to the satisfaction of that desire. He acknowledges that everyday explanations of action commonly invoke only a desire or a belief but argues that both are in fact required; we mention only that part of the cause which is most surprising, least generally known or most morally significant. The second theme has been described by Charles Taylor. Taylor (1964) explains behaviour in terms of Aristotelian teleology, that is, he argues that our present use of the terms 'action' and 'behaviour' do not allow them to be broken down into units of stimulus and response but require an explanation of behaviour in terms of its purpose. Thus, he differs from Papineau in regarding behaviour as 'pulled' into existence by its purpose, as opposed to 'pushed' into existence by the belief and desire of its agent. Taylor's teleological explanation of human behaviour clearly implies certain knowledge or beliefs on the part of the subject as well as a desire to act. The author refers to the 'Canute view' of those who reject purposive explanations of action and is graphic in his description of the logical consequences of behaviourist theory:

The area in which we can attribute responsibility, deal out praise or blame, or mete out reward or punishment, will steadily diminish - until in the limiting case, nothing will be left; the courts will be closed or become institutes of human engineering, moral discourse will be relegated to the lumber-room of history (pp. 42-43).

The emotive quality of Taylor's plea is not a new feature of this debate. In the sixteenth century

the use of teleological arguments to demonstrate the existence of a deity led Francis Bacon to compare teleological explanations to vestal virgins: 'They are dedicated to God, and are barren' (quoted by Papineau, 1990).

Even as they were written, the views of Hull and Guthrie were not universally held. William Hunter (1930) referred to the importance of 'symbolic processes' in influencing man's instinctive behaviour, invoking a model more cognitive than that allowed by some behaviourists. In 1932, Krechevsky published his claim to have found empirical evidence that rats running in mazes formed hypotheses to assist them in solving problems. In the second half of the twentieth century writers in medicine and psychology have been more prepared to entertain a cognitive view of behaviour where a subject's knowledge and beliefs assume a greater role. Austin (1956-7) described some of the elements in his 'machinery of action' as consciousness, voluntariness, self-control, knowledge and foresight. Fulford (1989) developed this theme in *Moral Theory and Medical Practice*, writing, 'in the case of raising my arm, what has to be specified, in addition to the state of motion of my arm, is my purpose in raising it'. Psychologists such as Spence (1956) and Mowrer (1960) still draw heavily on a view of learning based on Pavlovian conditioning but Mowrer's references to subjects 'learning to be afraid' and 'learning what to do' make it clear that he gives greater weight to the cognitive processes of his subjects than did his predecessors. McGinn (1979), developing the work of Davidson (1971), divides bodily movements into active and passive. Action is based on reasons and reasons for actions are based on a combination of desires and beliefs; in McGinn's words, 'desire without belief is blind, belief without desire is purposeless'. He adds several qualifications to this description of action. First, he argues that desires and beliefs exist in a dynamic state in the conscious mind and that interaction occurs between them; 'beliefs must be reckoned in the light of the pattern of desires'. Secondly, he argues that no general law of action can be derived from this framework; 'what was sufficient to make me cross the road on a certain occasion will almost certainly not be repeated'. Finally, he considers that belief and desire are not in themselves sufficient to produce the will to act and that this will is dependent on what he

calls 'noticings', internal or external cues which precipitate action.

In the second half of the twentieth century the influence of purely behaviourist explanations of human action has diminished. Recent medical and psychological writing has focused more on the influence of belief on human action and this reflects the tenor of philosophical writing on the subject. The role of beliefs in behaviourist theory is vague and this may go some way to explaining the lack of research in the psychological literature into actions based on delusional beliefs.

DELUSIONS IMPLICATED IN ACTION

This section will review the literature pertaining to the behavioural consequences of delusional beliefs. Ideally, such a review would be informed by epidemiological data providing information as to the likelihood of a particular type of delusion being acted upon. Unfortunately, most reports in this area are anecdotal and allow no such estimate of risk. In the absence of such data reference will be made, where the original literature allows, to descriptions of phenomenology to illuminate the link between abnormal belief and behaviour.

Delusions of persecution

Reports of actions based on delusional beliefs most frequently concern persecutory delusions; often these reports focus on violence inflicted on others. On 20 January 1843 Daniel McNaughton, apparently under the impression that he was attacking the Prime Minister, Sir Robert Peel, fired at and mortally wounded Edward Drummond who was Sir Robert's Private Secretary. At his trial it emerged that McNaughton believed he was the victim of a conspiracy and that he was being followed by spies sent by Catholic priests with the aid of the Tories, of whom Peel was the leader. At his trial he stated:

The Tories in my native city have compelled me to do this... They have accused me of crimes of which I am not guilty; they do everything in their power to harass and persecute me; in fact, they wish to murder me (Rollin, 1977, p. 92).

McNaughton was found not guilty and the 'McNaughton Rules', which govern the use of an insanity defence in English courts, were the direct outcome of his case. In this century many authors have recorded persecutory delusions in

mentally ill offenders but often make only vague reference to the motive for the crime. Bach-y-rita (1974) and Bach-y-rita & Veno (1974), examining 62 violent prisoners, found 13 who demonstrated 'subtle delusional systems' and who 'warranted a diagnosis of paranoid schizophrenia'. Green (1981), looking at 58 male homicidal patients in Broadmoor Hospital reported that in 27 cases the act of killing 'appeared to be a response' to the patients' persecutory beliefs. Shore *et al.* (1988, 1989) examined the subsequent criminal records of mentally ill people arrested near the White House, in many cases trying to see the President. They found that among those with no record of violent behaviour persecutory delusions were significantly associated with future violence. They gave no further details as to the nature of the delusions. Other authors give fuller descriptions. Maas *et al.* (1984) describe the case of a man who killed both parents claiming that they had tried to kill his children by drowning them in battery acid. Reviewing the records of 10 men charged with patricide, Cravens *et al.* (1985) found four cases where the father was considered by the patient to pose threats of 'physical or psychological annihilation'. Mawson (1985) found 14 patients with delusions of poisoning in a case-note study at Broadmoor Hospital and 'in all but one the symptom seemed an important antecedent factor to serious violence'. In a study of 15 matricidal men Campion *et al.* (1985) refer to a schizophrenic patient who killed his mother because he was convinced that she was a sadist who tortured him. Other authors have reported actions based on persecutory beliefs in association with Capgras delusions (Crane, 1976; Weinstock, 1976; Christodoulou, 1978; Romanik & Snow, 1984; Tomison & Donovan, 1988); De Pauw & Szulecka (1988) report that a patient attacked her mother believing that every time her mother put on her glasses she changed into a local woman who she disliked intensely. Häfner & Boker (1973) found that 8% of their sample of 263 violent schizophrenics exhibited 'paranoid feelings of malaise' and felt that these patients were especially likely to act on their delusions when they perceived an immediate threat to their lives or when persecutory beliefs were accompanied by bodily hallucinations or delusions of bodily harm.

Persecutory delusions have also been described in cases of self harm, but here again the

degree to which the delusional belief motivates the act is often unclear. In some cases, such as that described by Mintz (1964) where a cook on board ship cooked and ate his index finger in an attempt to 'rise above his persecutors in the way that Christ had', it is difficult to see any logical link. In other cases, such as those of ocular self-mutilation described by Shore *et al.* (1978), Shore (1979) and Yang *et al.* (1981) or of auto-castration described by Mendez *et al.* (1972), the link between persecutory belief and action seems vague. Blacker & Wong (1963) are more specific, describing the case of a man who castrated himself believing that evil spirits were using his body to perform unnatural acts. Standage *et al.* (1974) describe a case of genital self-mutilation in a female schizophrenic who believed that the men in her community were going to sexually molest her. Firesetting, eating and hospital attendance have also been claimed to be influenced by persecutory delusions. Virkunnen (1974) found that three out of 30 cases of arson committed by schizophrenics represented an attempt to escape persecutors. In 1911, Bleuler had described the case of a woman refusing to drink milk because she believed it was poisoned, and Lyketsos *et al.* (1985) have described cases where the eating habits of chronic schizophrenics have been influenced by similar fears. Hutchesson & Volans (1989) have described patients whose persecutory delusions led them to attend hospitals with unsubstantiated complaints of being poisoned.

Delusions of jealousy and grandiose delusions

The propensity of jealous delusions to be acted upon in a manner dangerous to others has been described by Shepherd (1961) and Mowat (1966). Gilles (1965) described the case of a schizophrenic who murdered his wife, telling his psychiatrist, 'a mysterious power told me she was being unfaithful'. More recently, Häfner & Boker (1973) noted delusions of love and jealousy in 11.2% of their sample of violent schizophrenics as against 1.4% of non-violent schizophrenic controls. Of the 14 patients at Broadmoor with delusions of poisoning described by Mawson (1985) six also had delusions of jealousy.

Actions based upon grandiose delusions were described in 1823 by John Haslam. Shortly after the New Bethlem Hospital was built in St George's Fields in London Haslam described

the case of Thomas Lloyd, whose confidence in his madrigal and linguistic abilities led him to dance and sing in public and address foreign visitors in miserable French. In the presence of a hypomanic affect, however, it becomes debatable whether such phenomena should be attributed to the mood state or to the delusional belief. Kraines (1957) wrote that:

the manic patient who says that he is the son of God is not expressing a delusion of symbolic significance as would be true in schizophrenic thinking, but has merely left unsaid the feelings that he is superior, that he is capable of undertaking any enterprise, that he is superior enough to be as powerful as the poetic concept of 'Son of God' (pp. 280–281).

Should such a patient attempt to walk on water it is not clear whether this would occur as a consequence of his belief or his mood. This point will be returned to in the discussion of drive, motivation and affect.

Delusions of passivity

The influence of delusions of passivity on behaviour is alluded to by Tomison & Donovan (1988) in their description of a 23-year-old man who attacked two others with a Stanley knife, but no details are given. Two studies of matricidal men (Green, 1981; Campion *et al.* 1985) also mention passivity, but in association with command hallucinations. Planansky & Johnston (1977) are more explicit. Looking at 59 male schizophrenics who had attacked others or made verbal threats to kill, they identified nine cases where the subject 'had to attack against their will, as if directed by others or by an impersonal force'. Delusions of passivity have also been described in cases of self-mutilation (Rosen & Hoffman, 1972; Sweeney & Zamecnik, 1981); Shore *et al.* (1978) describe the case of a man who enucleated both of his eyes believing that 'a force' had overpowered him and had taken control of his actions.

Delusions of ill health or bodily change

Delusions of ill health or bodily change have been described by Green (1981) in matricidal men and by d'Orban & O'Connor (1989) in women who kill their parents. Jones (1965) studied 13 chronic schizophrenic patients with stereotypies. One of his cases touched his ear repeatedly, explaining that it controlled the pumping of his blood. Häfner & Boker (1973) considered that delusions of bodily harm, when

linked with persecutory delusions, were associated with violence in schizophrenics. Delusions of bodily change leading to self harm were described in 1928 by Lewis, while Beilin (1953) reported the case of a Polish labourer who amputated his penis, claiming that there had been a change in his body contour and that he was assuming the form of a woman. Sweeney & Zamecnik (1981), reviewing predictors of self-mutilation in patients with schizophrenia, described instances of patients acting on beliefs that their blood needed to be cleansed or that a limb required surgical investigation.

De Clérambault's syndrome and Capgras

De Clérambault (1942), quoted by Goldstein (1987), includes – in his original description of the eponymous syndrome – a description of a man who repeatedly struck his ex-wife in public. Goldstein reviewed seven cases of erotomania and found that all had acted on their delusions, several to the extent of making physical assaults. Enoch *et al.* (1967) and Taylor *et al.* (1983) both emphasize the possibility of physical assaults consequent upon the imagined infatuation, but a recent review referring to the 'spectrum of dangerousness' in de Clérambault's syndrome concludes that 'the evidence that it usually represents anything more than an apparition remains unconvincing' (Bowden, 1990). Capgras syndrome has been linked with violent behaviour in several case reports (Crane, 1976; Weinstock, 1976; Christodoulou, 1978; Shubsachs & Young, 1988; De Pauw & Szulecka, 1988; Tomison & Donovan, 1988; Silva *et al.* 1989); Romanik & Snow (1984) describe the case of a 57-year-old woman who pointed a loaded gun at two meter readers believing that one of them was a homosexual who had been impersonating her by wearing a mask since he was eight. He had acted like a prostitute and sullied her reputation. Fishbain (1987) attempted to quantify the frequency of Capgras delusions but his paper highlights the methodological problem that Capgras delusions are usually reported only when attention is drawn to them by violent behaviour.

Delusions of guilt

Reports of delusions of guilt associated with behaviour usually involve self harm. Numerous examples exist in the literature of such an association in depression (e.g. Albert *et al.* 1965)

and even mania (Hartmann, 1925) and in depression the frequency of suicide attempts has been shown to correlate with delusional ideation (Miller & Chabrier, 1988). In schizophrenia, MacLean & Robertson (1976) describe the case of a man who enucleated his own eye when preoccupied with his 'sins'. Numerous reports exist of self-inflicted eye injuries (Westmeyer & Serpass, 1972; Shore *et al.* 1978; Crowder *et al.* 1979) and genital self-mutilation (Beilin & Gruenberg, 1948; Greilshheimer & Groves, 1979; Waugh, 1986) in the presence of delusions of guilt which do not appear to be mood congruent.

Religious and sexual delusions

Delusions with religious or sexual themes are common in psychiatry and similar themes are evident amongst those delusions which are acted upon. Witherspoon *et al.* (1989), reviewing the literature on self-inflicted eye injuries, found that 34 out of 85 patients gave religious reasons for their action. Often these are associated with delusions of guilt. Waugh (1986) describes a schizophrenic man who severed his testicles with a razor blade stating that he felt evil and that self-castration was the only way to gain forgiveness. In other cases religious beliefs in themselves seem to have motivated an act of self harm. Kushner (1967) quotes a schizophrenic who was 'sure that he had castrated himself in search of purification and not because of feelings of guilt'. In many cases the religious motivation is described in very general terms (Gorin, 1964; Anaclerio & Wicker, 1970; Crowder *et al.* 1979; Tapper *et al.* 1979; Sweeney & Zamecnik, 1981); Tenzer & Orozco (1970) describe the case of a woman who removed her own tongue after receiving a message from God that 'duty demanded it'. In other cases the motivation is more specific. Shore (1979) describes a patient who was found with a pencil lodged in his right eye who quoted Matthew 5: 29, 'And if thy right eye offend thee, pluck it out, and cast it from thee, for it is profitable for thee that one of thy members should perish, and not that thy whole body should be cast into hell.' Greilshheimer & Groves (1979) describe a case of genital self-mutilation invoking a similar passage at Matthew 18: 7-9. Waugh (1986) describes a man who castrated himself in response to a later passage at Matthew 19: 12, 'There are eunuchs born that way from their mother's womb, there are eunuchs made so by men and there are

eunuchs who have made themselves that way for the sake of the Kingdom of Heaven.' A religious component is frequently present in delusionally based acts which harm others (Maas *et al.* 1984); Campion *et al.* (1985) report the case of a 23-year-old man who killed his mother believing she was the devil.

Sexual ideation was present in the motivation of 21 out of 85 cases of ocular self-mutilation reviewed by Witherspoon *et al.* (1989). Frequently associated with guilt in such cases (e.g. MacLean & Robertson, 1976; Crowder *et al.* 1979), such ideation may also be implicated when the harm is directed at others. Cravens *et al.* (1985) described homosexual delusions focused on the father in three out of their ten cases of patricide.

OTHER PSYCHOTIC PHENOMENA AFFECTING ACTION

In the cases described a delusional belief is an important contributor to the psychotic individual's course of action. In many cases, however, the belief in question was held for a considerable period before being acted upon. And many patients hold similar beliefs without doing anything about them. As mentioned in the discussion of theoretical considerations, McGinn (1979) has argued that in addition to a belief itself, 'desire' and 'noticings' are required to explain an action. Is it possible to find equivalents for these terms in psychiatric phenomenology and hence use McGinn's model as a framework to investigate delusional action? This section will consider those elements of psychosis which affect the likelihood of a belief influencing a patient's behaviour.

Perceptual changes

Foremost among these elements may be the perceptual changes associated with schizophrenia. These will be examined with regard to two areas, namely, the perception of form and the perception of emotion. Cutting (1985) considers that although basic visual processes are probably normal in schizophrenia a deficit exists in the appreciation of visual form. He quotes Levin & Benton (1977), who demonstrated that chronic schizophrenics were worse than neurotics in their ability to recognize faces. Auditory perception may also be affected and, reviewing other modes of perception, Cutting

concludes that there is evidence for a disorder of body image perception in some patients (Weckowicz & Sommer, 1960; Cleveland *et al.* 1962). Examples given by the authors make clear the threatening nature of these perceptual changes: Weckowicz & Sommer quote the case of a man whose eyes were being pulled out so that in the mirror they appeared to be completely out of their sockets. Several workers have commented on the propensity of perceived threat to lead to violent action in psychosis (e.g. Mullen, 1988).

Perception of emotion has been found by several authors to be abnormal in schizophrenia. Dougherty *et al.* (1974) showed photographs of facial expressions to schizophrenic and control subjects and found that schizophrenics were significantly worse at identifying the emotion shown. Iscoe & Veldman (1963) found that schizophrenics did worse than controls when asked to arrange nine drawings in order from 'happy' to 'sad' and argued that they had difficulty in perceiving 'subtle emotional graduations'. Spiegel *et al.* (1962) found schizophrenics 'normally sensitive to the nuances of facial expression' but found that, while they were able to arrange facial expressions in order from angry to happy, they were unable to derive the criteria they were using. Similar findings have been described with reference to emotion in speech. Turner (1964) tested the ability of 60 schizophrenics and 30 controls to identify the emotional flavour of a taped nonsense sentence and found that the performance of schizophrenics was impaired. Studying 24 acute schizophrenics Jonsson & Sjöstedt (1973) found that they did worse than controls when asked to identify the emotional intonation of spoken single words. Perceptual changes such as these may correspond to the 'noticings' described by McGinn (1979) as triggers for action based on belief. The abnormal sensitivity of schizophrenics to certain emotional themes (Brodsky, 1963; Cutting, 1985) may also affect the likelihood of their acting on their delusions. Finally, it is possible that the decreased empathic ability of schizophrenics described by Milgram (1960) allows them to act in ways which cause harm to others.

The importance of these perceptual changes has been alluded to by several authors. MacLean & Robertson (1976) considered that a perception that an alarming change was occurring in one's body contributed to self-mutilation in psychotic

patients. Mowat (1966) found that many of his sample of morbidly jealous murderers described, as grounds for their delusional beliefs and subsequent action, a change in their wives' emotional attitudes. In their review of homicidal aggression in schizophrenic men Planansky & Johnston (1977) conclude that 'transient misperception of danger to life, very frightening and potentially ominous, was directly revealed by some men'. Of relevance here may be the work of Bemporad (1967) and Reich & Cutting (1982) showing that schizophrenics faced with visual problems were more likely to approach them by concentrating on details rather than on any overall view. In the words of Shakow (1950): 'If there is any creature who can be accused of not seeing the forest for the trees, it is the schizophrenic'. It may be that schizophrenia renders sufferers prone to concentrate on one or two threatening aspects of a situation which would be innocuous if viewed in overall perspective.

Insight

Insight might be expected to influence the likelihood of a patient acting on his or her delusions. A persecuted man might be less likely to take defensive measures if he had a suspicion that his persecutory beliefs were part of a psychiatric illness. Little research has been conducted in this area. Roback & Abramowitz (1979) studied the behaviour of schizophrenics in hospital and found that patients with a greater level of insight were rated as better adjusted behaviourally on 9 out of 12 measures. Van Putten *et al.* (1976), Lin *et al.* (1979) and Bartko *et al.* (1988) all found that compliance with treatment was improved in patients who were rated as exhibiting more insight. The principal methodological problem with all four studies is that decreased insight and behavioural disturbance could both be indicators of the severity of a patient's illness. The patients of Roback & Abramowitz who were insightful and behaviourally adjusted may have been less ill and the subjects in the other three studies may have possessed insight and complied with medication for the same reason. In any case, influencing behaviour in general is not the same as influencing actions based on delusions. Until further research is conducted the case for insight affecting delusional behaviour must be regarded as unproven, although common sense would suggest that it is a strong one.

Motor changes

In depression, psychomotor retardation inhibits all types of action and the increased risk of suicide attendant on the lifting of this retardation with treatment has long been recognized. In schizophrenia, the catatonic symptoms have been reviewed by Abrams & Taylor (1976). Of these, the possibility of explaining stereotypies in delusional terms has already been mentioned (Jones, 1965). As pointed out by Mayer Gross *et al.* (1960), however, this is very different from establishing a psychological cause and in any case the behaviours described by Jones are invariably of little consequence. Other catatonic symptoms such as negativism and stupor will influence actions based on delusions in the same non-specific and inhibitory way in which they influence all behaviour.

Drive, motivation and affect

Perhaps more important influences on motor behaviour in psychosis are such factors as drive, inclination and motivation. These concepts are very close to that of 'desire' as described by McGinn (1979) who considered it a pre-requisite for action based on belief. They also bear comparison with the concept of 'affectivity' described by Eugene Bleuler in 1924.

Action is for the most part influenced by affectivity, if one at least agrees with us when we designate the force and direction of the impulses, or of the 'will' as partial manifestations of the affects. He who is happy, sad or furious will react accordingly (p. 143).

In normal subjects the drive and inclination to act are closely linked to the affective and emotional aspects of a belief and it seems likely that the likelihood of a delusional belief being acted upon will be influenced by similar factors. In depression the link between a delusional belief and its affective component is so close that it becomes impossible to distinguish the two: the fact that psychiatrists use the term 'mood congruent' to describe certain delusions reflects the fact that these delusions are regarded as having an emotional quality which is inseparable from the belief itself. Any discussion of whether a psychotically depressed patient kills himself because of what he believes or because of what he feels rapidly becomes one of semantics. Similarly, in mania it is difficult to differentiate between grandiose delusions and hypomanic

affect as the cause of a patient's extravagant behaviour.

In chronic schizophrenia a reduction in the capacity to experience pleasure has been described by several authors (Harrow *et al.* 1977; Watson *et al.* 1979; Cook & Simukonda, 1981). It is unclear whether a similar reduction occurs in the capacity to experience other emotions, although work previously mentioned describing schizophrenics' difficulties in perceiving such emotions as anger (Spiegel *et al.* 1962) provides some circumstantial evidence that this is the case. If this is so it might be expected that the delusional beliefs of schizophrenics, charged with less emotion than those of others, should be acted upon less often. Other workers, however, have reached different conclusions. Feffer (1961) presented neutral and emotionally charged words to schizophrenic subjects and normal controls and found that schizophrenics avoided words with an affective connotation. Garety & Hemsley (1987) found that a high proportion of deluded subjects found their delusions distressing. The work of Vaughn & Leff (1976) showing that schizophrenics living with high 'expressed emotion' (EE) relatives were more prone to relapse, and later work (Leff *et al.* 1982) showing that relapse rates fell when EE was reduced would suggest that, in some cases, schizophrenics are over sensitive to emotion. It seems likely that the emotional responsiveness of schizophrenics is not simply reduced but altered in quality. It may be that schizophrenics may attach emotion inappropriately to certain beliefs, including delusional ones, and are then more likely to act upon them.

Cognitive factors

In this connection mention must be made of cognitive factors which may influence delusional behaviour. With regard to depression the effect of psychomotor retardation has already been discussed. With regard to schizophrenia several mechanisms have been proposed while little confirmatory evidence has emerged. An impaired ability to make probabilistic judgements has been described (Huq *et al.* 1988). Frith (1987) described a model for first rank symptoms and 'negative signs' in schizophrenia. First rank symptoms, he argued, are consequent upon defective monitoring of action while negative signs result from an imbalance between 'willed intentions' and 'stimulus based intentions'. A

later paper (Frith & Done, 1989) provided some experimental evidence for the first of these proposals but not for the second relating to negative symptoms and the implications for delusional behaviour are unclear. Robertson & Taylor (1985) tested a group of men held in prison or maximum security hospital on criminal charges and found that their deluded group showed a deficit of 'immediate memory'. It is possible that such memory deficits are the result of the impaired use of mnemonic strategies: Bauman (1971) showed that schizophrenics' memory for three letter sequences failed to improve even when it was pointed out to them that the sequences began with consecutive letters of the alphabet. Robertson & Taylor argued that, as a consequence of their memory deficits, deluded patients were likely to misinterpret external stimuli. Other specific cognitive deficits have been invoked with regard to perception and have already been discussed. In more general terms it is agreed that the relatively intact cognitive function of chronic paranoid patients is associated with a greater propensity for violent action than the impaired cognitive function of patients with an acute psychosis (Krakowski *et al.* 1986). It is not clear that this association represents a causative link however, or what form such a link might take.

Although a distinct thread has yet to emerge from the investigation of cognitive function in schizophrenia, this area of research does offer some correspondence with theoretical writing on the subject. The views of Fulford (1989) with regard to the importance of belief in the genesis of action have already been mentioned. The work of the same author offers the tantalizing suggestion that the link between a delusional belief and an ensuing action may be impaired in a way which is inseparable from the genesis of the belief itself. Fulford rejects the conventional definitions of delusion pointing out, *inter alia*, that many delusions are not beliefs at all but value judgements. He suggests that delusions could better be described as 'defective reasons for action'. Could these defective reasons be the products of defective reasoning of a type not previously described? Fulford argues that the nature of the deficit is unclear and that considerable clinical and philosophical work is required even to clarify the issues involved.

Other factors

Several other aspects of the mental states of psychotic patients have been implicated in delusional action. Shore (1979) reported that flattening of affect allowed the schizophrenic patient to injure himself severely as a consequence of his delusions. Other authors (Greilshaimer & Groves, 1979; Waugh, 1986) have also reported flattening of affect in association with self harm based on delusions and Mullen (1988) has argued that 'emotional blunting' is associated with violence in schizophrenia. Häfner & Boker (1973), however, in their large study of mentally abnormal offenders, found that 'only a small proportion of schizophrenic offenders have flatness of affect'. Some of the issues involved have been discussed in the section covering drive, motivation and affect. The degree of systemisation of delusional beliefs was found by Häfner & Boker to be related to violent behaviour, and several less methodologically sound studies, reviewed by Krakowski *et al.* (1986), have reached similar conclusions. The presence of hallucinations or perceptual changes in cases where delusions of jealousy and poisoning are associated with violence has been referred to by Shepherd (1961), Mowat (1966) and Varsamis *et al.* (1972). In mania, Schipkowensky (1968) has invoked the 'pathologically increased social connection of the manic' to explain what he regards as a very low incidence of violence in these patients (quoted by Krakowski *et al.* 1986). Psychodynamic factors are important concomitants of delusionally motivated self harm according to Maclean & Robertson (1976) who state that 'castration fears, failure to resolve oedipal conflicts, repressed homosexual impulses, severe guilt and self punishment are ubiquitous in such cases'. Other authors describe such theories as 'unwarranted generalization' (Tapper *et al.* 1979) or 'subjective' (Sweeney & Zamecnik, 1981); the debate here has echoes of a more general one concerning the relevance of psychodynamic theory to psychiatry.

CONCLUSION

An improved understanding of the likelihood of delusional beliefs being acted upon would help psychiatrists to assess risk to the psychotic patient and to others. In this context it would be

advantageous to be able to attribute risk to the belief itself or to other features of the patient's psychosis. Such an understanding would also be relevant to the study of the phenomenology of delusions. If a patient holds a belief with absolute conviction yet fails to take the appropriate action (or feel the appropriate emotion), does this indicate that the patient's conviction is in fact less than absolute, that the belief somehow means less to them than it would to others or that the patient has some insight into his condition? The answer is far from clear and experimental designs which allow investigation of delusional action may offer some insight into the nature of delusions themselves.

This paper has reviewed the theoretical basis for action, pointing to the reappearance of beliefs as important causes of action after a period during which more behaviourist explanations held sway. Recent explanations have been described in which action is seen as being caused by a combination of belief and desire and triggered by factors such as 'noticings'. It has been argued that these concepts correspond to some of the findings of psychiatric research. 'Desire' may well correspond to psychiatric concepts of motivation, drive and inclination and 'noticings' find likely equivalents in the field of perceptual changes, perhaps influenced by other cognitive aspects of psychosis. The correspondence is far from exact, however, while the details of how desires and beliefs are triggered by 'noticings' to form the intention to act have not been clarified for healthy subjects, let alone for patients suffering from psychosis. As Fulford (1989) has pointed out, avenues of research in this area are legion and underexplored.

In 1941 Aubrey Lewis wrote:

Patients often do not act in accordance with their delusional beliefs, especially when these are fleeting or chronic... But this is, on the whole, unusual in the early or acute stages of the illness: a patient will then act on his beliefs violently or in terror; he may go to the police or be driven to suicide (p. 1189).

Lewis alludes to two factors which have been discussed here, namely the chronicity of delusions and their emotional context. Further research could also usefully measure such aspects of delusional belief as conviction and preoccupation and quantify the behavioural correlates of these components. Measurements of the behavioural correlates of other aspects of psy-

chosis, such as affective incongruity and insight, would also be of value. Past behaviour may be the best predictor of future behaviour, but an improved understanding of action based on delusional belief may help psychiatrists to refine and define this maxim.

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