

# THE INTERPRETATION OF INTRUSIONS IN PSYCHOSIS: AN INTEGRATIVE COGNITIVE APPROACH TO HALLUCINATIONS AND DELUSIONS

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**Abstract.** A cognitive approach to the understanding of psychotic symptoms that focuses on the interpretation of intrusions into awareness is outlined. It is argued that many positive psychotic symptoms (such as hallucinations and delusions) can be conceptualized as intrusions into awareness or culturally unacceptable interpretations of such intrusions, and that it is the interpretation of these intrusions that causes the associated distress and disability. It is also argued that the nature of these interpretations is affected by faulty self and social knowledge and that both the intrusions and their interpretations are maintained by mood, physiology, and cognitive and behavioural responses (including selective attention, safety behaviours and counterproductive control strategies). The literature is reviewed and found to be compatible with such a model and the clinical implications are discussed.

*Keywords:* Cognitive, hallucinations, delusions, psychosis, appraisal.

## Introduction

There has been extensive research conducted in recent years examining cognitive intrusions and their role in psychopathology. Intrusive thoughts were defined by Rachman (1978) as being repetitive thoughts, images or impulses that are unacceptable or unwanted; subsequently, Rachman (1981) added that they are usually accompanied by subjective discomfort and must interrupt ongoing activity. Clark and Purdon (1992) more recently suggested that unrealistic, ego dystonic and uncontrollable should be added to the definition of obsessional intrusive thoughts. It has been found that normal obsessions are a common experience (Rachman & De Silva, 1978; Salkovskis & Harrison, 1984) and it has been suggested that most everyday thoughts could be defined as being intrusive (Rachman & Hodgson, 1980). Wells and Matthews (1994) have recently suggested that there are three types of intrusion into awareness: these are external stimulus information, cognitive state information, and body state information. The above characteristics of intrusions highlight them as potentially useful in explaining psychotic symptoms as phenomenological analyses of psychosis tend to find similar characteristics (see Morrison & Baker, 2000). The latter definition of intrusion suggested by Wells and Matthews (1994) will be adopted for the purposes of this paper.

Recent developments in the conceptualization of anxiety disorders have incorporated both

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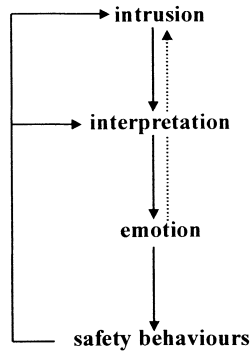
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intrusions and the interpretation of intrusions, and such advances in theoretical understanding have resulted in new and refined clinical approaches to intervention. This paper attempts to apply these developments to our understanding of psychotic symptoms (particularly hallucinations and delusions); not to provide a definitive model of psychosis but rather in the hope of stimulating discussion, practice developments and new research. In addition to the seminal work of Beck (1976) and the more recent work of leading theorists in the anxiety disorders field (e.g., Clark, Salkovskis, & Wells), this approach has been influenced by the work of several research groups who have been studying psychosis (notably Bentall and colleagues, Chadwick and Birchwood, and Garety and colleagues).

### *Interpretations and intrusions in anxiety and psychosis*

The interpretation of such intrusions into awareness is at the heart of many cognitive analyses of anxiety disorders. The cognitive model of panic (Clark, 1986) states that panic attacks result from an enduring tendency to misinterpret certain bodily sensations (usually normal anxiety responses) in a catastrophic manner (perceiving them as being indicative of an immediate disaster). It is hypothesized that this tendency to make such catastrophic misinterpretations is maintained in two ways: selective attention or hypervigilance to idiosyncratic threat cues such as monitoring the body for signs of danger (Clark, 1988; Ehlers & Margraf, 1989; Salkovskis, 1988), and avoidance, including safety seeking behaviours that prevent spontaneous disconfirmation of threat (Salkovskis, 1991). The cognitive approach to hypochondriasis outlined by Warwick and Salkovskis (1990) also relies on a misinterpretation model; they suggest that patients experience health anxiety because they misinterpret unexpected physical symptoms as evidence of serious physical illness, and that these misinterpretations are maintained by processes such as selective attention, bodily checking and reassurance seeking (which are also consistent with Salkovskis' conceptualization of safety behaviours). Similarly, recent cognitive models of obsessive compulsive disorder (Salkovskis, 1985; Rachman, 1997; Salkovskis, Forrester, Richards, & Morrison, 1998; Wells, 1997) suggest that it is the appraisal or interpretation of intrusive thoughts that is the major source of distress and that these beliefs about intrusions may be maintained by neutralizing behaviour designed to reduce perceived responsibility or prevent unwanted consequences. Again, these cognitive conceptualizations of OCD include selective attention as a maintaining factor. Thus, it can be seen that many of the current approaches to anxiety disorders involve the misinterpretation of essentially normal intrusions, and suggest that these misinterpretations are maintained by safety behaviours (including selective attention) designed to reduce the likelihood of the feared outcome (this approach is represented in Figure 1).

Recently, Morrison (1998a) has applied a similar analysis to the maintenance of auditory hallucinations (the most common psychotic symptom in patients with a diagnosis of schizophrenia; World Health Organization, 1973). It is suggested that an internal or external trigger results in a normal auditory hallucination that is then misinterpreted as threatening the physical or psychological integrity of the individual (such as "I must be mad", "The Devil is talking to me" and "If I do not obey the voices they will hurt me"). These misinterpretations produce an increase in negative mood and physiological arousal, which produce more hallucinations, leading to a vicious circle. Simultaneously, the misinterpretation of the hallucination elicits safety seeking behaviours (including hypervigilance), which can both



**Figure 1.** A generic cognitive model (based on current conceptualizations of anxiety disorders)

increase the occurrence of auditory hallucinations and prevent the disconfirmation of the misinterpretation (therefore maintaining it). This account, like Chadwick and Birchwood's (1994) approach, suggests that it is the appraisal of auditory hallucinations that results in distress and disability.

#### *Metacognition in anxiety and psychosis*

Another recent development in the cognitive conceptualization of anxiety disorders is the increasing recognition that metacognition is an important factor. Wells and Matthews (1994) have proposed a self-regulatory executive function (S-REF) model of emotional disorders, and several specific cognitive models of anxiety disorders have been developed incorporating elements of this. The S-REF model suggests that vulnerability to psychological dysfunction is associated with a cognitive-attentional syndrome characterized by heightened self-focused attention, attentional bias, ruminative processing and activation of dysfunctional beliefs. In this model, cognitive-attentional experiences such as biased information processing and cognitive intrusions are mediated by executive processes that are directed by the patients' beliefs. Some beliefs are metacognitive in nature and are linked to the interpretation, selection and execution of particular thought processes. Wells (1995) states that such metacognitive beliefs include beliefs about thought processes (e.g., "I have a poor memory"), the advantages and disadvantages of various types of thinking (e.g., "My worrying could make me go mad"), and beliefs about the content of thoughts (e.g., "It is bad to think about death"). Discussing such beliefs in reference to generalized anxiety disorder and obsessive-compulsive disorder, Wells (1995) argues that in these patients, it is their *appraisal* of and *response* to their cognitive processes that distinguishes them from non-clinical samples, as opposed to the *content* of their cognitions.

Applying similar ideas to psychotic symptoms, Morrison, Haddock and Tarrier's (1995) heuristic model of auditory hallucinations suggests that they may be experienced when intrusive thoughts are attributed to an external source, in order to reduce cognitive dissonance. They speculate that this dissonance is caused by the incompatibility of certain intrusive thoughts and metacognitive beliefs (in particular, beliefs about controllability). Bentall (1990) also implicates metacognitive beliefs as a top-down factor that may influence the occurrence of auditory hallucinations. Wells and Matthews' (1994) self-referent executive

function (S-REF) model would certainly suggest that the occurrence of hallucinations may be influenced by such metacognitive beliefs, as hallucinations would be conceptualized as low-level intrusions that are mediated by self-beliefs.

### **Interpretations of intrusions in psychosis: an integrative model**

Applying the components of these conceptualizations of anxiety to the phenomenology of psychotic symptoms suggests that intrusions into awareness that are misinterpreted in certain ways will be viewed as psychotic phenomena. The nature of the misinterpretation that is made by a person will be determined by a combination of their experience, beliefs and knowledge. Examples of such misinterpretations that would be defined as psychotic would include an individual interpreting intrusive thoughts as evidence of alien thought insertion; interpreting intrusive impulses as evidence of alien control over one's body; interpreting auditory hallucinations as evidence that the devil is trying to make you kill your neighbour; interpreting the mention of one's first name on television as evidence that everyone is talking about you or that the media are communicating directly with you; or interpreting a visit from a television license inspector as evidence of a government conspiracy against you. It is evident how such interpretations will have been influenced by people's experiences and beliefs (for example, the latter may be more likely if the person has had experiences of genuine persecution such as racism or bullying, and holds beliefs about the untrustworthiness of people and governments). These "psychotic" misinterpretations will be maintained by safety behaviours (including selective attention), plans for processing, faulty self-knowledge (including metacognition) and social knowledge and mood and physiology. This is summarized in Figure 2. This model is clearly similar to the conceptualizations of anxiety disorders described above. The main difference that appears to constitute the classification of such interpretations as psychotic seems to be their cultural unacceptability. For instance, if someone misinterprets their racing thoughts or palpitations as a sign of alien control or persecution via telekinesis, they will be classified as delusional, whereas misinterpretation of the same sensations as a sign of impending madness or a heart attack would be regarded as indicative of panic disorder. Similarly, a benign lump in one's skin may be misinterpreted as a sign of cancer by a hypochondriacal patient, but the misinterpretation of the same stimuli as being a transmitter or homing device installed by the secret police would be more likely to result in a patient being regarded as psychotic. In the same way, an unacceptable blasphemous thought may be viewed by an obsessional patient as meaning something bad will happen unless it is atoned for, whereas the same type of thought may be interpreted as evidence of demonic possession in a psychotic patient. It also seems likely that cultural unacceptability is at the heart of other defining symptoms of schizophrenia such as negative symptoms and bizarre behaviour (however, further consideration of this is beyond the scope of this paper). Evidence supporting each part of this model will now be examined in detail.

#### *Intrusions into awareness*

Can psychotic symptoms or their triggers be conceptualized as essentially normal intrusions into awareness? As has been previously argued (Morrison, 1998a), there is some evidence that voices are a normal psychological phenomenon that may potentially be experienced by anyone. Authors have suggested links between sexual abuse and auditory hallucinations

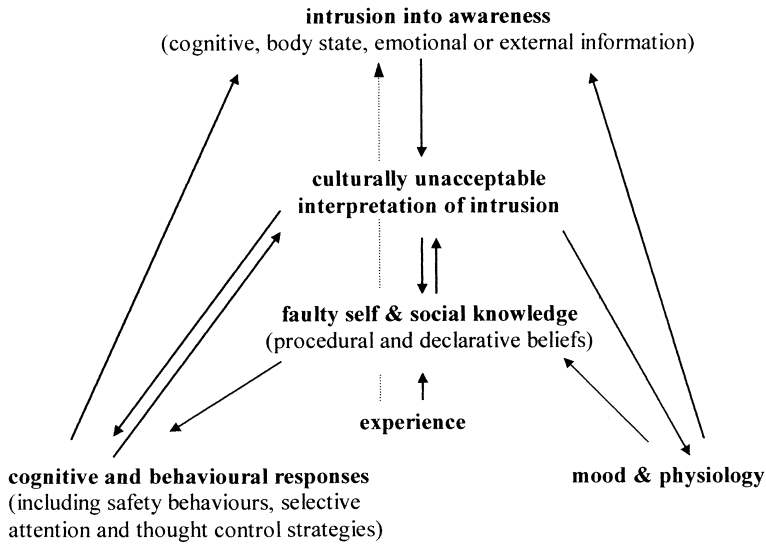


Figure 2. A model of psychosis

(Heins, Gray, & Tennant, 1990; Sansonnet-Hayden, Haley, Marriage, & Fine, 1987), and a study of bereaved older adults found that 82% experienced hallucinations and/or illusions one month following bereavement (Grimby, 1993). Other examples of situations (cited in Kingdon & Turkington, 1994) that can induce psychotic symptoms such as auditory hallucinations include being held hostage (Siegel, 1984), sleep deprivation (Oswald, 1974), sensory deprivation (Vernon, 1963) and solitary confinement (Grassian, 1983). In addition, studies assessing the occurrence of verbal hallucinations in college students have consistently found that a large minority (37–39%) report experiencing such phenomena (Posey & Losch, 1983; Barrett & Etheridge, 1992). Surveys of hallucinatory experiences suggest that 10–25% of the general population have had such experiences at least once (Slade & Bentall, 1988). Additional support for the notion of auditory hallucinations as normal phenomena comes from Romme, Honig, Noorthoorn and Escher’s (1992) finding that of the 173 subjects experiencing auditory hallucinations who had responded to a request on television, 39% were not in psychiatric care. Morrison (1998a) concluded that these findings suggest that hallucinations may be normal responses to certain events or triggers, and conceptualizes them as being similar to body sensations in panic disorder. Thus, it may be possible to view such experiences as essentially normal phenomena.

Morrison et al. (1995) have suggested that intrusive thoughts, images and impulses are likely to be implicated in the development of psychotic symptoms, and that psychotic symptoms such as voices, thought insertion, thought broadcasting and passivity phenomena may be misattributed intrusions (including both cognitive and body state information). Baker and Morrison (1998) found that patients with auditory hallucinations experienced their thoughts as being less wanted and less controllable than control groups, which is consistent with such a suggestion. Clearly, there are real phenomenological differences between voices and intrusive thoughts (as well as similarities), such as the acoustic quality of an auditory hallucination; however, such an experience consists of a combination of cognitive, body

state and (possibly) external information, and can thus be conceptualized as an intrusion into awareness.

Several of the current theories regarding the development and maintenance of psychotic symptoms explicitly involve some notion of intrusions and others are certainly compatible with such notions. Hoffman (1986) has suggested that auditory hallucinations are the result of “parasitic memories”, which disrupt language production processes, and that the unintendedness of verbal images is a key component of the phenomenology of voices. In addition, Hemsley’s (1993) cognitive model of schizophrenia suggests that the “intrusion of unexpected/unintended material from long-term memory” is a cognitive abnormality associated with schizophrenia. The work of Maher (1974), which suggests that delusions are the result of normal reasoning processes that serve as explanations for anomalous perceptual experiences, is consistent with the incorporation of intrusions into a theory of psychosis, as such anomalous experiences will consist of a combination of cognitive, body state and external information. Fowler (2000) states that “most people with psychotic disorder have periods in which they have anomalous conscious experiences (e.g., thoughts being experienced as voices, alterations in the experience of thoughts; disordered or heightened sensory perception)”, and appears to argue that such anomalies are central to the development of psychosis and are qualitatively different to the experiences of people without psychosis. Again, these anomalies are likely to consist of cognitive, body state or external information and are therefore amenable to conceptualization as intrusions into awareness. The evidence for such experiences being qualitatively different is far from convincing; as mentioned earlier, thoughts experienced as voices is a common experience in the general population (particularly following certain life events), alterations in the experience of thoughts are present in most patients with anxiety disorders (as the work on metacognition demonstrates – see Wells, 2000, for a review), and disordered or heightened sensory perception is easily induced in most people (for example, taking certain substances will produce perceptual changes, as will sleep deprivation).

Chadwick and Birchwood (1994) and Chadwick, Birchwood and Trower (1996) have used an ABC approach to understanding and intervening with psychotic symptoms; their notion of antecedent events to delusional beliefs (within which they include the experience of hearing a voice) could also be viewed as compatible with a role for intrusions in the development and maintenance of psychosis.

A recent study (Morrison & Baker, 2000) examining the cognitive intrusions of psychotic patients in comparison with non-patients found that patients with a diagnosis of schizophrenia who experienced auditory hallucinations had more intrusive thoughts than both the psychiatric and non-patient control groups. In addition, such patients found their intrusive thoughts more distressing, uncontrollable and unacceptable than the two control groups. There were no differences between the intrusive thoughts and voices of patients experiencing auditory hallucinations on any of the dimensions assessed (once frequency was controlled for), suggesting similarities between these two phenomena.

With reference to delusional beliefs, Verdoux et al. (1998) and Peters, Joseph and Garety (1999) have shown that large proportions of people with no psychiatric history endorse items examining delusional ideas. Van Os et al. (1999) reported that over 60% of non-GHQ cases, and over 80% of people who met GHQ caseness but had no history of psychosis, endorsed some items of delusional ideation. Peters et al. (1999) found that an average of

30% of a large normal sample ( $n = 470$ ) endorsed individual items of delusional ideation, and found that a sample of people belonging to religious cults scored significantly higher.

In addition, the well documented links between drugs such as amphetamine and cocaine and psychotic symptoms are consistent with an account that incorporates intrusions into awareness. Kingdon and Turkington (1994) have noted that hallucinations can occur in organic confusional states such as those induced by drugs (such as LSD and cocaine) and alcohol withdrawal, and it is widely recognized that such drugs can cause paranoia. It is possible that such drugs induce an increase in the frequency of intrusions into awareness (including anomalous experiences), making a psychotic interpretation more likely (in a similar way to Clark's (1986) explanation of the cognitive mediation of sodium lactate induced panic).

Thus, it does seem plausible to suggest that some psychotic symptoms and the triggers for other psychotic symptoms could be viewed as essentially normal intrusions into awareness (using Wells and Matthews' (1994) broad definition of intrusion, which encompasses external stimulus information, cognitive state information and body state information). This would also be compatible with the notion of biological vulnerabilities for psychosis, as structural or chemical factors could affect the rate and type of intrusions/ambiguous stimuli experienced.

### *Interpretations of intrusions*

There is considerable evidence that suggests that the interpretation of intrusions is central to the understanding of psychotic symptoms. Kingdon and Turkington (1993) state that "the meaning invested in hallucinations may also be of importance – whether a person says to himself, 'The devil is talking to me' or 'I must be going crazy', or dismissively, 'That was a strange sensation, I must have been overtired'" (p. 78). It has been proposed by several authors that the appraisals of positive symptoms (including auditory hallucinations) are likely to determine the cognitive, behavioural, affective and physiological responses or consequences (Chadwick & Birchwood, 1994; Morrison et al., 1995; Morrison, 1998a; Tarrier, 1987). A study utilizing the beliefs about voices questionnaire (BAVQ; Chadwick & Birchwood, 1995) found a strong positive relationship between appraisals of malevolence and resistance of the voices and between appraisals of benevolence and engagement with the voices. More recently, Morrison and Baker (2000) found that patients' interpretations of their voices were associated with the measures of distress in relation to them, and that such interpretations were superior to frequency of voices as a predictor of distress. It has also been shown that appraisals regarding stigmatization and the need for social containment of the mentally ill are associated with depression in patients with schizophrenia (Birchwood, Mason, MacMillan, & Healy, 1993), suggesting that social meanings may contribute to the development and maintenance of misinterpretations regarding ambiguous or anomalous experiences.

Peters et al. (1999), in their study of delusional ideation, found that it was not the content of beliefs that distinguished between delusional patients on a psychiatric ward and the general population, but rather the degree of conviction, distress and preoccupation; this is parallel to the differentiation between individuals with obsessive-compulsive disorder from normal individuals who have intrusive thoughts with very similar content (Rachman & De Silva, 1978; Salkovskis & Harrison, 1984). This suggests that it is how such thoughts are

interpreted that is the difference between psychotic patients and the general population. In a study examining obsessional thoughts, Jakes and Hemsley (1996) reported that patients with obsessional thoughts were more likely to resist their thoughts, view them as senseless and seek reassurance in relation to them than patients with delusions, again suggesting that how people interpret their thoughts may distinguish diagnostic groups.

It is suggested here that the initial interpretation of an intrusion will determine choice of cognitive and behavioural responses or strategies that will affect the subsequent occurrence of similar intrusions (as discussed below). Thus, if someone interprets an auditory hallucination as the result of stress or sleep deprivation, they may reduce arousal or get some sleep but not give the hallucination any further thought. However, if the same person were to interpret it as being a sign of madness or indicative of their neighbour's attempts to harm them, they may engage in hypervigilance for similar experiences, attempt to suppress the experience, punish themselves for it or adopt safety behaviours to prevent the feared outcome, all of which may contribute to the maintenance of further hallucinations. The same processes appear to apply to how people interpret seeing "666" in a number plate, hearing clicks on their telephone line, or having a thought that seems unusual.

### *Experience*

It is generally accepted that beliefs develop as a result of experience. There are several studies that suggest that patients with a psychotic diagnosis have a much higher incidence of traumatic experiences (e.g., Mueser et al., 1998) and psychotic symptoms are often found in populations that have been traumatized such as survivors of sexual abuse, combat veterans and refugees (e.g., Ensink, 1992; Butler, Mueser, Sprock, & Braff, 1996; Kinzie & Boehnlein, 1989). Therefore, while being speculative, it is likely that such experiences will contribute to the development of faulty self and social knowledge and the nature of interpretations of intrusions (for instance, sexual or physical abuse may lead people to believe that others cannot be trusted, which would make paranoid interpretations of ambiguous events more likely). There is often a striking congruence between a patient's life events and early experience and the content of their symptomatology; in a recent study, some empirical support for this was found by Raune, Kuipers and Bebbington (1999) who reported some association between themes expressed in delusions and auditory hallucinations and the demand characteristics of stressful events before onset. Again, Romme and Escher (1989) found that 70% of voice hearers developed their hallucinations following a traumatic event, and Honig et al. (1998) compared the form and content of chronic auditory hallucinations in three cohorts (patients with schizophrenia, patients with a dissociative disorder, and nonpatient voice-hearers). They found that, in most patients, the onset of auditory hallucinations was preceded by either a traumatic event or an event that activated the memory of earlier trauma, and that the disability incurred by hearing voices was associated with the reactivation of previous trauma and abuse. It is also important to consider the possibility that certain experiences may directly cause "psychotic" intrusions, as discussed earlier (e.g. being taken hostage or held in solitary confinement may cause hallucinations).

As well as previous experience, current environment clearly plays a significant part in the development and maintenance of psychosis. Stressful life events have been consistently identified in association with initial onset and subsequent relapse of schizophrenia, and such findings have led to the general acceptance of stress-vulnerability models of schizophrenia



(e.g., Nuechterlein & Dawson, 1984). Family environment, and expressed emotion in particular, has also been shown to be associated with relapse in psychotic disorders (Butzlaff & Hooley, 1998).

It seems indisputable that previous experience (traumatic events in particular) is implicated in the development of psychosis, and it appears likely that such experiences influence belief formation, which will in turn influence the nature of interpretations of intrusions into awareness. It is also likely that certain types of experience (e.g. sleep loss, drug use, bereavement and childhood trauma) will increase the rate of certain types of intrusions and ambiguous stimuli.

### *Self and social knowledge (including metacognition)*

There are several groups of researchers who have identified beliefs about aspects of the self as being important in psychosis. As mentioned earlier, Chadwick and Birchwood (1994) have demonstrated that beliefs about voices are meaningfully related to their emotional and behavioural consequences, and Morrison (1998a) has suggested that interpretations of voices determine the associated distress and disability.

It is evident that patients experiencing auditory hallucinations can hold positive and negative beliefs about their voices. Positive beliefs may be associated with efforts to engage and maintain particular hallucinatory experiences; indeed, Chadwick and Birchwood (1994) found that voices believed to be benevolent were engaged. In a study examining the attitudes of 50 psychiatric inpatients to their hallucinations, it was found that over 50% reported some positive effects of hallucinating, with the most commonly cited benefits being that the hallucinations were relaxing or soothing and that they provided companionship (Miller, O'Connor, & Di Pasquale, 1993), supporting an association between positive beliefs and hallucinations. Morrison, Wells and Nothard (2000) found that positive beliefs about unusual perceptual experiences were the best predictor of predisposition to auditory and visual hallucinations in normal subjects. On the other hand, negative beliefs about hallucinations may be associated with unhelpful coping strategies. Chadwick and Birchwood (1994) found that voices believed to be benevolent were resisted by patients and it has been suggested that deliberate suppression of auditory hallucinations may be counterproductive (Morrison et al., 1995). It has been suggested by Morrison et al. (2000) that it may be the co-occurrence of positive and negative beliefs about voices that distinguish patients from non-patients who hear voices, and that hallucinations may be partially motivated and become distressing only when appraised as uncontrollable and dangerous. It is also common to find patients with delusional ideas who hold positive beliefs regarding their delusions, particularly in the earlier stages; for example, persecutory ideas may add meaning to the person's life, making them special, may provide excitement (something often lacking from a psychiatric patient's existence) or may defend against self-blame (as suggested by Bentall, Kinderman and Kaney, 1994). In other words, positive beliefs about unusual experiences or beliefs may be implicated specifically in the development of psychotic symptoms; for example, a patient may take substances to induce such phenomena, deliberately allocate attention to such phenomena, or such phenomena may occur as a coping response as suggested by Romme and Escher (1989). It would only be when such psychotic experiences are appraised as uncontrollable or dangerous, or lead to negative environmental consequences (such as problems with occupational and social functioning), that they become problematic.

Positive and negative beliefs about thoughts may also be implicated in the development and maintenance of hallucinations. Baker and Morrison (1998) found that patients experiencing auditory hallucinations scored higher on metacognitive beliefs concerning both positive beliefs about worry and negative beliefs about uncontrollability and danger associated with thoughts. They also found that both groups of patients with a diagnosis of schizophrenia (with and without hallucinations) scored higher than non-patients on beliefs about metacognitive efficiency and beliefs about punishment, responsibility and superstition, and that subjects who scored higher on predisposition to hallucination had different metacognitive beliefs in comparison with subjects of low predisposition. In addition, Freeman and Garety (1999) found that the majority of a sample of people with persecutory delusions experienced meta-worry concerning the control of delusion-relevant thoughts.

Another theoretical approach that has placed great emphasis on another type of self-knowledge is that of Bentall et al. (1994). They state that paranoid thinking is functional or defensive in that it can reduce actual-self/ideal-self discrepancies and thus protect self-esteem by making external causal attributions for negative events. Several experiments have found support for both the hypothesized external attributional bias (Kaney & Bentall, 1989; Kinderman & Bentall, 1996) and an implicit negative self-concept (Lyon, Kaney, & Bentall, 1994). Frith (1992) has also suggested that positive psychotic symptoms such as hallucinations and delusions result from an impairment in the ability to represent mental states. In particular, thought insertion and passivity phenomena (delusions of control) are associated with an inability to represent a patient's own intentions to act (Frith & Done, 1989; Mlakar, Jensterle, & Frith, 1994). Thus it appears that there are many ways in which different types of faulty self-knowledge, including positive and negative beliefs, have been demonstrated to be involved in the development or maintenance of psychotic symptoms.

Whilst there has been less emphasis placed on examining the social and real world knowledge of psychotic patients, there are some studies documenting deficits in social knowledge. Cutting and Murphy (1990) have demonstrated an impaired ability of patients with a diagnosis of schizophrenia to appreciate social knowledge about their culture in comparison with depressed and manic patients, and argue that decreased competence in social judgements is an intrinsic feature of schizophrenia. Further evidence for the involvement of impaired social knowledge in psychotic symptoms can be found in Frith and colleagues' work examining theory of mind in schizophrenia. Corcoran, Mercer and Frith (1995) found that psychotic patients had difficulty interpreting the intentions behind indirect speech. Frith and Corcoran (1996) showed that acutely ill psychotic patients performed worse than controls on false-belief tasks and concluded that psychotic symptoms reflect an impaired ability to infer the mental states of others. However, recent results (Drury, Robinson, & Birchwood, 1998) suggest that such difficulties are state characteristics (as opposed to trait) and may be due to information-processing overload. In addition, research examining dysfunctional attitudes, which include faulty self- and social knowledge, have found psychotic patients and patients with a diagnosis of delusional disorder to exhibit high levels of such beliefs (Fear, Sharp, & Healy, 1996; Zimmerman, Coryell, Corenthal, & Wilson, 1986). On the basis of these findings, it is clear that faulty social knowledge is likely to be a vulnerability factor for psychosis, and has certainly been implicated in the development or maintenance of certain psychotic symptoms.

*Procedural beliefs (plans for processing) and information processing bias*

Within the S-REF model, Wells and Matthews distinguish between procedural and declarative beliefs (the latter guide the selection and execution of strategies for the processing of information such as reasoning strategies, thought control techniques and allocation of attention). While little research has directly examined plans for processing, there are a large number of studies that have focused on the nature of processing itself in psychotic patients. However, the above studies regarding metacognition give some indication that people with psychosis exhibit dysfunctional plans for processing (e.g., positive beliefs about worry).

Possibly the most frequently studied aspect of information processing in schizophrenia is that of attentional bias. Bentall and his colleagues (Bentall & Kaney, 1989; Kaney, Wolfenden, Dewey, & Bentall, 1992; Kinderman, 1994) have demonstrated that patients experiencing persecutory delusions have biases in information processing, and have suggested that these processes may be involved in the maintenance of delusions. Bentall and Kaney (1989) found that, using the emotional Stroop task, deluded patients exhibited selective attention to paranoia-related words, and Kaney et al. (1992) found that deluded patients showed biased recall towards threatening propositions. In addition, Leafhead, Young and Szulecka (1996) found that a patient with delusional beliefs selectively attended to material related to her delusions (indicated by slower colour naming times on a modified Stroop task) and that this bias was not present when the patient had recovered.

A significant body of research has examined the role of self-awareness (or self-focused attention) in schizophrenia. Frith (1979) has argued that the symptoms of schizophrenia can be interpreted as the result of excessive self-awareness, and Ingram (1990) has suggested that an over-reliance on self-focused attention may be an important concept in an account of schizophrenia. This would certainly be consistent with the finding that increased private self-consciousness (a measure of self-focused attention; Fenigstein, Scheier, & Buss, 1975) was associated with an increased tendency to perceive oneself as the target (Fenigstein, 1984, study 4), suggesting a relation to persecutory delusions. Similarly, Smari, Stefansson and Thorgilsson (1994) found that paranoia was associated with private self-consciousness in male schizophrenics, and Morrison and Haddock (1997b) have shown that patients experiencing auditory hallucinations exhibit higher levels of private self-consciousness than psychiatric and normal control subjects. In addition, a recent experimental study suggests that reducing internal focus of attention decreases the external attributional bias found in patients experiencing auditory hallucinations (Ensum & Morrison, in preparation).

There has also been extensive research examining reasoning processes in psychosis, most notably by Garety and her colleagues. Huq, Garety and Hemsley (1988) found that deluded subjects request less information on a probabilistic reasoning task than control groups before reaching a decision; this finding has been replicated by Garety, Hemsley and Wessely (1991), and is highly consistent with Beck's (1976) notion of thinking errors such as jumping to conclusions. Huq et al. (1988) also found that deluded subjects expressed higher levels of certainty in their decision, thus showing overconfidence in their judgements, and Alpert (1985) found that hallucinating subjects were inappropriately confident when guessing the content of filtered brief phrases.

Garety and Hemsley (1994) suggest that the normal tendency to perceive more support for a belief than is actually in evidence (or confirmation bias) is involved in delusion

formation and maintenance. More recently, Bentall and Young (1996) have shown that delusional patients demonstrated a confirmation strategy for positive outcomes and a disconfirmation strategy for negative outcomes (just as normal controls did) in a study examining their hypothesis testing. Finally, Bentall et al.'s (1994) model of persecutory delusions would also seem consistent with a conceptualization that incorporates plans for processing, as it is possible that such procedural beliefs may influence the selection and execution of the external attributional bias that is hypothesized to reduce self-discrepancies. There is also a significant body of work that has demonstrated that patients who experience auditory hallucinations make external attributions for internal mental events (e.g., Baker & Morrison, 1998; Bentall, Baker, & Havers, 1991; Heilbrun, 1980; Morrison & Haddock, 1997a).

It therefore appears that there are information processing biases that have been demonstrated in psychotic patients, and there are some initial indications that such biases may be associated with procedural beliefs.

#### *Attempts to control and safety behaviours*

There are initial indications that dysfunctional or counterproductive attempts at control are involved in psychosis. Morrison et al. (2000) found that subjects who scored higher on predisposition to hallucination used different thought control strategies in comparison with subjects of low predisposition. Freeman and Garety (1999) compared thought control strategies in patients with persecutory delusions and patients with generalized anxiety disorder and found no significant differences between the two groups in strategies used. In addition, Morrison and Wells (2000) found that patients with a diagnosis of schizophrenia used significantly more punishment and worry-based control strategies and significantly less distraction based control strategies than normal subjects.

Is there any evidence that safety behaviours may be operating in the maintenance of psychotic phenomena? Morrison (1998b) has suggested that, in the same way that people with anxiety disorders adopt certain behaviours in order to prevent some feared catastrophe (Salkovskis, 1991, 1996; Clark, 1996; Wells et al., 1995), those with distressing delusional beliefs initiate attempts to avert any negative outcomes that are implied in the delusional belief. The example cited is of a patient who, believing that he/she is being followed by the IRA, attempts to lose the trackers by taking varying routes to the shops, hiding behind cars and changing clothes regularly or going out in disguise. These strategies may inhibit cognitive change as they are preventing disconfirmation of the delusional belief by providing extenuating factors.

Morrison (1998a) has also argued that safety seeking behaviours that are designed to prevent a threat to the individual's physical or psychological integrity that is attributed to the experience of auditory hallucinations (e.g., shouting back at a voice in order to avoid doing what the voice says or attempting to distract oneself from the voice to avoid going mad) may be removing the possibility for disconfirmation of the interpretation of the hallucination (in this case, that the patient must obey an omnipotent voice or will go mad as a result of hearing the voice). There is evidence that patients do engage in safety behaviours of the sort that *may* maintain their negative appraisals regarding their hallucinations (e.g., lying down, drinking alcohol, breathing exercises, jogging, shouting at or talking to the voices, seeking interaction; see Frederick & Cotanch, 1995; Nayani & David, 1996; Romme

et al., 1992). Recently, Nothard, Morrison and Wells (2000) used a semi-structured interview to elicit interpretations of voices and corresponding safety behaviours, and found that 11 of 12 patients reported clearly identifiable safety behaviours.

In addition to preventing disconfirmation of the interpretation of an intrusion, it is also possible that some safety behaviours may directly increase the frequency of the intrusion itself. Patients experiencing auditory hallucinations have been reliably shown to adopt certain strategies in an effort to cope with their voices (Falloon & Talbot, 1981; Frederick & Cotanch, 1995; TARRIER, 1987). Romme et al. (1992) found that subjects' use of distraction as a coping strategy was associated with perceived inability to cope with their voices, and Nayani and David (1996) found that the use of watching television and listening to the radio as coping strategies was often cited as making hallucinations worse. Thus, it is possible that the use of certain safety behaviours may directly increase auditory hallucinations in a manner similar to that proposed by Salkovskis (1996) in anxiety. Similarly, the evidence discussed above in relation to selective attention and heightened self-focus in psychotic patients may increase the actual frequency or perceived frequency of intrusions in the same way that hypervigilance to threat can increase intrusions in anxiety. Thus, it can be seen that safety behaviours and dysfunctional attempts to control unwanted thoughts are present in patients with a psychotic disorder.

### *Mood and physiology*

Experimental and phenomenological findings, in relation to hallucinations in particular, suggest that mood and physiology are implicated in the maintenance of such phenomena, as the onset of hallucinatory episodes is associated with psychophysiological arousal (Allen & Argus, 1968; Cooklin, Sturgeon, & Leff, 1983), and emotional experiences such as anxiety (Slade, 1972), sadness and anger (Nayani & David, 1996) have also been shown to be associated with increases in the experiencing of hallucinations. In their model of delusional formation, Garety and Hemsley (1994) implicate both high affective loading of stimuli and high physiological arousal in the development and maintenance of delusional beliefs, and Kemp, Chua, McKenna and David (1997) found that deluded patients' reasoning worsened in problems containing emotive material. Gumley, White and Power's (1999) application of interacting cognitive subsystems theory to understanding psychotic relapse suggests that body state information and emotional inputs may directly affect implicational meaning (and hence, within this model, self and social knowledge), which in turn is likely to affect ongoing interpretations of intrusions into awareness. It is also likely that the physiological effects of sleep deprivation and drug use will be involved in the development and maintenance of psychosis.

Such a model is also compatible with the findings regarding biological factors in psychosis (such as structural, chemical and genetic differences), as these could result in increased intrusions or anomalous experiences.

### *Summary and a case formulation*

It has been argued that many positive psychotic symptoms can be conceptualized as intrusions into awareness (e.g., auditory hallucinations) or the culturally unacceptable interpretations of such intrusions (e.g., delusional beliefs), and that it is the interpretation of these

intrusions that causes the associated distress and disability. It is also argued that these culturally unacceptable interpretations are determined by faulty self and social knowledge (including positive and negative beliefs about intrusions into awareness and their interpretation). Self and social knowledge is in turn determined by experience. It is suggested that these intrusions and their interpretations are maintained by mood, physiology (including the effects of sleep deprivation and drug use), and cognitive and behavioural responses (including selective attention, safety behaviours and counterproductive control strategies), which are guided by procedural beliefs. This may be better illustrated by applying this model to an individual case. Figure 3 shows how the model can be adapted for use as an idiosyncratic case formulation (here applied to a patient who presented with persecutory ideas about being controlled by the devil, ideas of reference and auditory hallucinations).

### Clinical implications

If this model is valid, there are several implications for clinical practice; in essence, interventions should target interpretations of intrusions and the cognitive and behavioural responses that are affected, either directly (e.g., changing thought control strategies) or indirectly (e.g., by evaluating self and social knowledge). Many of the clinical developments pioneered in the field of anxiety disorders could be applied to intervening with psychotic patients; in particular, those derived from the approaches of Clark, Salkovskis, Wells and their colleagues. Lessons that can be learnt from their effective therapies and applied to psychosis include the importance of informing people that their difficulties are understandable (and therefore not “mad”), providing a convincing alternative explanation for their difficulties (via the cognitive model and idiosyncratic formulations), and adopting a scientist-practitioner stance collaboratively with the patient (either it is real or you believe it to be real – let’s test which of these is accurate).

Specific recommendations could include the identification and manipulation of safety behaviours, which is likely to be crucial to maximizing the efficacy of cognitive therapy for psychosis. Generation of an alternative explanation for a person’s psychotic experiences and provision of a convincing rationale for therapy by collaborative development of a cognitive formulation will help to engage the patient and determine choice of intervention. Recognition of the role of life experiences in shaping the nature of the interpretations made will be important in producing a formulation, and assessment of factors commonly associated with the development of psychosis, such as sexual and physical assault history, may be useful. A lack of self- and social-knowledge should also be addressed if indicated by the formulation; this could be done by encouraging the patient to conduct surveys of other people (possibly in conjunction with the therapist) or by setting specific investigative homework assignments. For example, a patient who believes that a specific number plate has personal meaning or represents a message could be encouraged to learn about how number plates are assigned, how many of each set of letters or numbers are made, whereas a patient who believes their voices are the result of telepathy could be encouraged to examine the scientific evidence for telepathy. Identification and subsequent challenging of procedural beliefs and positive beliefs about psychotic symptoms should also be considered; if a patient takes substances to induce symptoms in order to relieve boredom, or believes that their voices keep them company, or that being pursued by an organized crime syndicate makes them

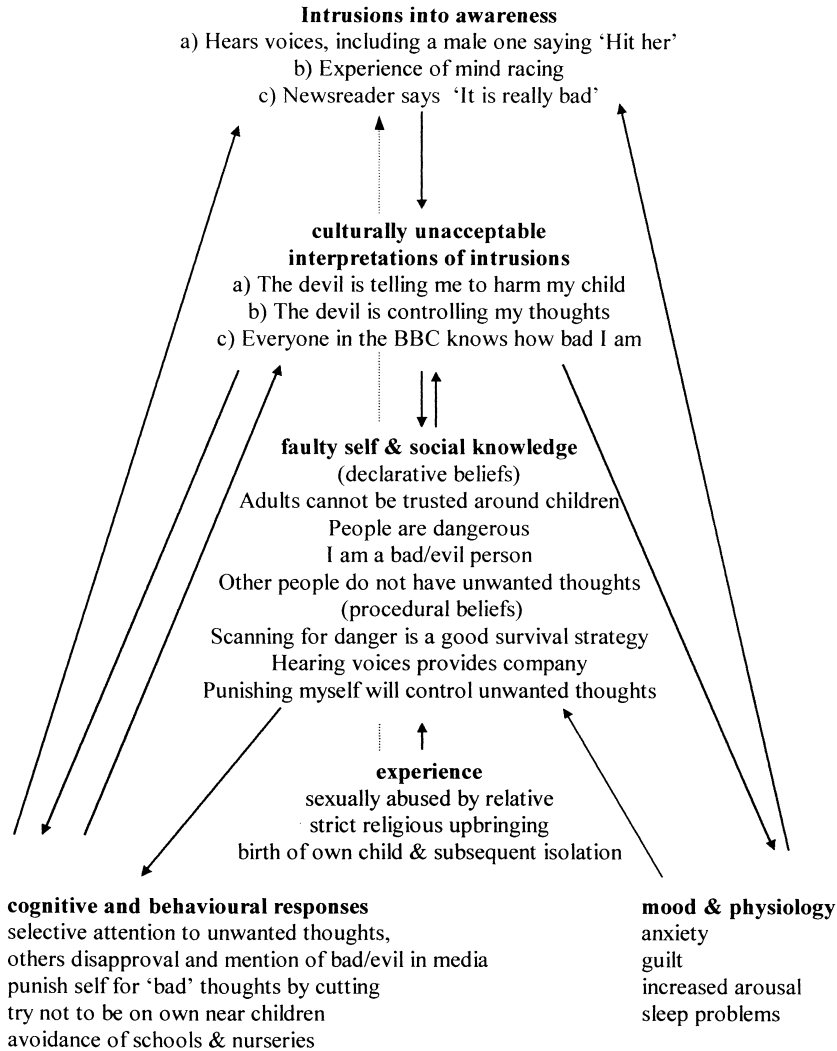


Figure 3. A case formulation

important and special, then these will be involved in maintaining the difficulties experienced. It is important to provide an alternative method of obtaining the benefits, however; for instance, activity scheduling, improving social networks or developing alternative ways of being special or important (e.g., in a role as a parent or friend, voluntary or paid employment etc).

The application of treatment strategies that target attentional processes and the procedural beliefs that direct attention, as discussed by Wells (1997) in relation to anxiety disorders, is also likely to result in more effective treatments for psychotic symptoms. Such interventions include attention retraining, metacognitive profiling and the teaching of detached mindfulness.

Another implication is that educational interventions that emphasize the normalizing approach pioneered by Kingdon and Turkington (1994) could be targeted at vulnerable or at-risk populations in order to prevent people becoming psychotic; this may be effective as the provision of such information could prevent catastrophic interpretations of intrusions, rectify faulty self and social knowledge and make the formation of culturally unacceptable interpretations less likely; a randomized controlled trial comparing such a form of cognitive therapy with monitoring only is currently being conducted (Morrison & Bentall, 1999). In addition, influencing the cultural acceptability of interpretations directly by challenging media stereotypes regarding psychosis and madness is likely to have a beneficial effect in the long-term.

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