



Relationships between trauma and psychosis: A review and integration

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Objectives. This paper examines the research and theoretical literature on potential links between trauma and psychosis.

Methods. Three main alternatives are considered; can psychosis cause PTSD, can trauma cause psychosis and could psychosis and PTSD both be part of a spectrum of responses to a traumatic event? The more influential studies considered are critically evaluated and methodological considerations specific to research regarding trauma and psychosis are also examined.

Results. Evidence is found in support of each of these relationships, and an integrative approach to conceptualizing the relationships is suggested.

Conclusions. Recent conceptualizations of PTSD and psychosis are used to inform the consideration of these different pathways, and the implications for theories of psychosis and trauma and the clinical implications for services for psychotic patients are discussed.

Despite calls for greater awareness (Lundy, 1992; Shaner & Eth, 1989; Williams-Keeler, Milliken, & Jones, 1994), there have been few empirical investigations into the relationships between post-traumatic stress disorder (PTSD) and psychosis since the initial suggestion by Jeffries (1977) that they may coexist. Studies, such as those by Cascardi, Mueser, DeGirolomo, and Murrin (1996), Craine, Henson, Colliver, and MacLean (1998), and Mueser *et al.*, (1998), suggest that lifetime prevalence of PTSD is significantly higher in patients with severe mental illness than in the general population, which is estimated to be 8–9% (Breslau, Davis, Adreski, & Peterson, 1991; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). However, there is currently some controversy about the relationship between the symptoms of PTSD and psychosis, much of this discussion being focused on the potential direction of causality (if any).

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It is hoped that similarities in terms of processes implicated in the development and maintenance of PTSD and psychotic symptoms may help to integrate some of the different areas of research that have occurred to date. The three different possible relationships between psychosis and trauma that have received attention from empirical researchers will now be examined in detail; these are whether psychosis can cause PTSD (focusing on PTSD diagnosis and post-traumatic stress symptomatology), whether trauma can cause psychosis (focusing on traumatic events experienced by patients with diagnosis of a psychotic disorder and psychotic symptoms), and whether psychosis and PTSD could both be part of a spectrum of responses to a traumatic event (focusing on common processes in both post-traumatic stress symptomatology and psychosis).

Can psychosis cause PTSD?

A traditional psychiatric view construes psychosis and PTSD as conceptually distinct disorders, but nevertheless suggests that the experience of acute psychosis and/or psychiatric hospitalization may be sufficiently traumatic to precipitate the development of PTSD (Lundy, 1992; McGorry *et al.*, 1991; Shaner & Eth, 1989; Shaw, McFarlane, & Bookless, 1997; Williams-Keeler *et al.*, 1994). This possibility has been supported by the findings of McGorry *et al.* (1991), Meyer *et al.* (1999), and Shaw, McFarlane, and Bookless (1997).

Can psychosis be a traumatic event?

Previous views of psychosis have highlighted the role of stress in precipitating psychosis (e.g. Nuechterlein & Dawson, 1984), but have not considered the stressful impact of psychotic symptoms themselves (Shaw *et al.*, 1997). Some authors propose that hallucinatory and delusional disturbances can shatter the persons experience of themselves, the world, and others (Bayley, 1996; Davidson & Strauss, 1992; Shaner & Eth, 1989) in a similar way to non-psychotic trauma (Janoff-Bulman, 1979). Sufferers' accounts (e.g. Herrig, 1995; Jordan, 1995) and clinical case studies clearly depict the terror of psychosis and describe the re-experiencing of the psychotic episode, and the widespread avoidance of cognitive, affective, and situational reminders of the experience (Shaner & Eth, 1989), conforming to current conceptualizations of PTSD (Ehlers & Clark, 2000).

Traditional thinking about PTSD has focused on the traumatic quality of external, rather than internal events (Lundy, 1992). However, research into the event characteristics which contribute to the experience of trauma emphasizes: severity/intensity of trauma; degree of terror/horror; duration of impact; unexpectedness; presence of threat after the event; ratio of loss vs. available resources; potential for prolonged alteration of the post-disaster environment; perceptions of control; and cultural/symbolic aspects of the event (Foy *et al.*, 1984; Lyons, 1991). None of these features lie beyond the psychotic experience, which is often argued to fall outside the range of usual human experience (Williams-Keeler *et al.*, 1994), and could readily involve perceptions of intense fear, helplessness, or horror demanded by DSM-IV criteria for PTSD. However, the requirement that the traumatic event must include actual or threat, of death, serious injury, or threat to physical integrity, is more contentious. The ability of psychosis to threaten one's own or others' life or physical

integrity depends on the concession that 'threat' may be subjectively as well as objectively experienced. Support for the validity of subjective interpretations of 'threat' in the development of PTSD comes from research which suggests that, although rape is a clear 'threat to physical integrity' victims who *perceive* the assault as life-threatening are more likely to develop PTSD than those who do not, regardless of whether or not weapons were used (Kilpatrick *et al.*, 1989). Certainly, in reporting the comments of a patient following their first psychotic episode, Jackson and Iqbal (2000) provide a convincing demonstration of the similarities between the reaction to psychosis and PTSD: 'You get some image or feeling of what happened there [in hospital], you're often distracted by and go quiet in the middle of a conversation . . . it draws you in like the voices did, wanting you to listen harder and closer' (p. 69).

PTSD in response to psychosis

Unlike that for other emotional disorders, the diagnostic criteria for PTSD are unique in their specification of the precipitating trauma (McGorry, 1995; Scott & Stradling, 1994). However, there are several reports of people displaying full PTSD symptoms, similar to those following more catastrophic trauma (Spurrell & McFarlane, 1995), due to cumulative stressors or vicarious traumatisation, without the direct experience of acute precipitating trauma (Ravin & Boal, 1989; Scott & Stradling, 1994). Such findings give further support to the validity of PTSD as a possible consequence of psychosis.

Several studies have now investigated this possibility in some detail. Shaw *et al.*, (1997) found that 52% of 45 inpatients qualified for a DSM-III-R diagnosis of PTSD (American Psychiatric Association, 1987). However, this study utilizes a relatively small sample that is highly selected (e.g. quick discharges would be excluded). McGorry *et al.* (1991) found that 46 and 35% respectively, of 36 patients qualified for a DSM-III (American Psychiatric Association, 1980) diagnosis of PTSD at 4 and 11 months following discharge. This study also has a small sample and relied on self-report data for the diagnosis of PTSD but clearly supports the hypothesized relationship. A lower, but still significant, rate of PTSD (11%) was reported by a study of an inpatient sample of psychosis sufferers in Finland (Meyer *et al.*, 1999); however, this rate is not dissimilar to the rate in the general population. Rates similar to the Australian studies (51%) were found amongst a larger sample ($n = 105$) of people with schizophrenia receiving community care in Berlin (Priebe, Broker, & Gunkel, 1998); however, this study did not take traumatic experiences other than psychiatric treatment into account, which may have confounded results. Frame and Morrison (2001) studied 60 adults with psychotic illness in acute psychiatric wards, using survey and semi-structured interview techniques, in hospital, and 4–6 months later. Sixty-seven and 50% of the sample reported clinically significant PTSD symptoms at time one and follow-up, respectively. Psychotic experiences (as opposed to other traumas and hospital experiences) accounted for 52% of the variance in PTSD scores in a multiple regression analysis after residual psychotic symptoms were controlled for statistically. This study used parallel forms of self-report measures to attempt to separate out the differential contributions of psychosis, hospitalization, and other traumas, but this may have been confusing for some participants. Another recent study examining 35 first-episode psychotic patients found similar levels of post-traumatic stress symptomatology (intrusions and avoidance) in this sample to that found in survivors of a shipping disaster (Jackson, 2000). Jackson concluded that PTSD is a relevant concept for people recovering from first-episode psychosis but that it needs to be viewed within a wider

framework of normal adaptation to the realities of psychosis. In their recent study of 42 consecutive admissions, Shaw, McFarlane, Bookless, and Air (2002) used a highly reliable PTSD interview schedule and found that 52.3% of their sample met criteria for post-psychotic PTSD.

PTSD and experience of psychiatric services

It is possible that some of the findings regarding people with a psychotic diagnosis experiencing PTSD could be accounted for by traumatic experiences of psychiatric services and admission to hospital. The sudden introduction to a closed environment with other disturbed individuals, particularly if influenced by sensationalist media reports of serious mental illness, may also be traumatic (Beveridge, 1998) and may include witnessing/enduring verbal, sexual, and physical harassment (Shaw *et al.*, 1997). Morrison, Bowe, Larkin, and Nothard (1999) examined the psychological impact of admission to psychiatric hospital, with particular reference to the proportion of patients that experience clinically significant levels of symptoms of post-traumatic stress disorder. In a sample of 34 patients, the prevalence of PTSD in relation to psychiatric admission, defined using a cut-off on the impact of events scale (Horowitz, Wilner, & Alvarez, 1979), was found to be 44%. The majority of patients also reported experiencing strong and varied emotional reactions to psychiatric admission. However, this study had an extremely low response rate, suggesting that the sample may not be representative. Similar findings were reported by Priebe, Broker, and Gunkel (1998), who examined the rate of PTSD precipitated by treatment experiences, and found a rate of 51% amongst their (much larger) community sample of people with schizophrenia.

Several reports suggest that many patients agree with the principle of involuntary admission and treatment procedures following the recovery/stabilization of their illness (e.g. Adams & Hafner, 1991; Hammill *et al.*, 1989; Kjellin & Nilstun, 1993). Nevertheless the implementation of compulsory admission procedures, or use of procedures such as enforced sedation, restraint, and seclusion, has been suggested to heighten the person's sense of fear, victimization and helplessness over their experiences (Beveridge, 1998; Brody, 1995; Rooney *et al.*, 1996). Consideration of such stresses led McGorry and his colleagues to suggest that hospital experiences may be a direct cause of PTSD within psychosis (McGorry *et al.*, 1991). However neither the McGorry study nor the study reported by Priebe, Broker, and Gunkel (1998) found any significant relationship between the number or circumstance (voluntary/enforced) of hospital admissions and the severity/rate of PTSD. Frame and Morrison's (2001) study found that hospital experiences accounted for only an additional 6% of the variance, after the 52% of variance in PTSD scores due to psychotic experiences had already been accounted for, and that compulsory admission under the mental health act was unrelated to PTSD.

Clearly, there are many studies suggesting that a substantial proportion of people with psychosis develop PTSD in response to their psychotic experiences and/or their hospital treatment, but, as has been noted, many of these studies have some methodological flaws. Most of the criticisms (e.g. self-report data, symptom overlap, and multiple sources of trauma) are inherent in the majority of PTSD research, and do not invalidate the findings, but would advise caution in interpreting the results of an individual study. Since the findings of high rates of PTSD in response to psychosis have been replicated in many studies with differing methodologies, it is reasonable to conclude that some people do develop PTSD as a response to psychotic experiences.

Can trauma cause psychosis?

One relationship between trauma and psychosis that has been suggested is that psychosis may emerge as a reaction to trauma (e.g. Ellason & Ross, 1997; Read, 1997). This suggestion draws upon the high rates of childhood sexual abuse and other traumas among psychotic populations (e.g. Goff *et al.*, 1991; Masters, 1995; Mueser *et al.*, 1998; Ross & Joshi, 1992) and the precipitating influence of negative life events and/or aversive environmental conditions on psychotic symptoms (Kingdon & Turkington, 1994; Romme & Escher, 1989). However, it should be noted that some of these studies have problems with their sample, and the life events literature is still somewhat equivocal in relation to psychosis.

There is much speculation about the relationship between traumatic life events and the development of psychosis; particularly its association with childhood sexual abuse (CSA), physical abuse, or interpersonal violence. In a seminal study, Romme and Escher (1989) found that 70% of voice hearers developed their hallucinations following a traumatic event, and they suggested that hearing voices may be part of a coping process. However, this study was not an empirical study, largely providing rich qualitative data that were not designed to test hypotheses. 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 non-patient 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. However, their sample was not random.

Sexual abuse and psychosis

Psychiatric populations typically report a higher incidence of previous traumatic experiences than non-psychiatric samples (Davidson & Smith, 1990; Jacobson & Richardson, 1987; Mueser *et al.*, 1998). Many studies have examined the links between sexual abuse and psychosis (see Read, 1997, for a comprehensive review). Surveys have indicated that between 34 and 53% of patients with severe mental illness report CSA or physical abuse (Darvez-Bamez, Lemperiere, Degiovanni, & Gaillard, 1995; Goff *et al.*, 1991; Ross, Anderson, & Clark, 1994), and 56% of patients admitted for first-episode psychosis reported CSA (Greenfield Stratowski, Tohen, Batson, & Kolbrener, 1994). Beck and van der Kolk (1987) found that 46% of 26 chronic, hospitalized patients with a psychotic disorder reported a history of incest, and Friedman and Harrison (1994) found that 60% of 20 patients with a diagnosis of schizophrenia had experienced CSA. Recently, Read, Agar, Argyle, and Aderhold (2002) reviewed the case notes of 200 community patients and found that those who had experienced sexual abuse (in childhood or as an adult) were significantly more likely to endorse two or more of the characteristic symptoms of schizophrenia (as defined in DSM-IV). Such findings suggest that many people with psychotic symptoms may have endured specific, or cumulative, experiences of trauma prior to the onset of their psychosis (Honing, 1988; Stampfer, 1990). It could be argued that most of these studies have methodological difficulties in relation to the definition and measurement of sexual abuse, as they rely on self-report or case notes; however, it is difficult to envisage an ethical alternative to such research strategies.

Ross *et al.* (1994) found that patients who report childhood abuse are more likely to

report positive psychotic symptoms, although their study relied upon self-report of sexual abuse. They suggest that there are at least two pathways to schizophrenia: an endogenously driven pathway characterized by negative symptoms and a pathway determined by childhood trauma characterized by a predominance of positive symptoms. As Read (1997) states, '... it seems reasonable to conclude that there may indeed be relationships between childhood abuse and adult psychosis, and, more specifically, between childhood abuse and schizophrenia' (p. 450).

Other traumatic events and psychosis

Other studies report higher rates of psychotic disorders in groups of individuals with PTSD compared with the general population (Kinzie & Boehnlein, 1989). In their recent study examining post-psychotic PTSD, which employed the clinician-administrated PTSD scale, Shaw *et al.* (2002) found that their entire sample ($n = 42$) had experienced at least one other traumatic event that met DSM-II-R stressor criteria. They also found that 36.8% had experienced two such events, and 43.4% had experienced three or more. Mueser *et al.* (1998) examined the lifetime incidence of trauma in a large sample of people ($n = 275$) with serious mental illness and found that 98% had experienced at least one traumatic event. This study used a highly reliable interview schedule. In a recent study of a large first-admission cohort of people with psychotic disorders ($n = 426$), Neria, Bromet, Sievers, Lavelle, and Fochtmann (2002) found that lifetime prevalence of trauma exposure was 68.5% and that 26.5% of those exposed met criteria for PTSD. This study also used a highly reliable interview schedule to ascertain DSM-IV psychotic diagnosis, PTSD diagnosis, and trauma history.

Psychotic symptoms have long been observed in the aftermath of a range of traumatic life events; for example, Grimby (1993) demonstrated that 82% of elderly participants in his study experienced either hallucinations or illusions 1 month after bereavement, and therefore, this could be considered a normal reaction. Estimates of lifetime exposure to interpersonal violence for people with a severe mental illness vary between 48 and 81% (Hutchings & Dutton, 1993; Jacobson & Richardson, 1987). In a sample of 458 undergraduates, Berenbaum (1999) found that reported childhood maltreatment was associated with higher levels of unusual perceptions and beliefs. Whilst methodological problems do exist with some of these studies, it appears undeniable that trauma is a common occurrence for people with a diagnosis of a psychotic disorder.

Further evidence that trauma can lead to psychotic states can be found by examining studies of concentration-camp survivors. Eitenger (1964, 1967) studied survivors in Norway and Israel and found that a core group of patients, particularly those in Israel, clearly met the schizophrenia criteria of that time, and he attributed this to the trauma they had experienced in the concentration camps. Klein, Zellermyer, and Shanan (1963) and von Baeyer (1977) described psychosis among some Nazi-concentration-camp victims. Beebe (1975), describing a long-term follow-up of Pacific Theater prisoners of World War II, found a marked increase in schizophrenia in those prisoners who had experienced the most severe traumas. More recently, Kinzie and Boehnlein (1989), in a study of Cambodian refugees who suffered trauma as a consequence of the Pol Pot regime, concluded that the symptoms of PTSD and psychosis coexist in this population. Whilst there is some support for the view that traumatic events such as combat may be associated with the development of psychosis, many of the studies in this area are single case descriptions, so further research is needed.

Links in content between psychotic symptoms and trauma?

Some authors have argued that there is a link between the content of abusive experiences and the content of psychotic symptoms. Read and Argyle (1999) examined the relationship between three positive symptoms of schizophrenia (hallucinations, delusions, and thought disorder) and childhood physical and sexual abuse among psychiatric inpatients. They found that 17 of the 22 patients with an abuse history exhibited one or more of these three symptoms and that half of the symptoms for which content was recorded appeared to be related to the abuse. However, this study had a small sample size and obtained their data from analysis of case notes (which may question the reliability and validity of reports of symptoms and abuse). More recently, Read *et al.* (2002) found, in a sample of 200 community patients, that hallucinations were significantly related to sexual abuse and childhood physical abuse. This was particularly the case for commenting voices and command hallucinations. Goff *et al.* (1991) have also suggested that such a history of CSA may contribute to the symptomatology and course of a psychotic illness. It is common for victims of sexual abuse to experience flashbacks, intrusive images, and bodily flashbacks associated with the abuse often years after the event (Heins, Gray, & Tennant, 1990; Sansonnet-Hayden, Haley, Marriage, & Fine, 1987). Somatic delusions such as delusional parasitosis (the belief that one is infested with parasites such as mites, lice, insects, or bacteria, often in or under the skin but sometimes internally or around bodily orifices) are also documented following traumatic life events such as rape and sexual assault (Oruc & Bell, 1995); however, this is a case study, so it should be interpreted with some caution. Furthermore, in Beck and van der Kolk's (1987) study of chronically hospitalized psychotic women, it was found that patients reporting histories of childhood incest were more likely to have sexual delusions. This congruence between the nature of traumatic experiences and the form and content of psychotic symptoms suggests that there may be a causal link. However, an alternative view would be that psychotic symptoms are always related to the persons' developmental history and that if this contains traumas, this will be used in their development of explanations for anomalous experiences.

This striking congruence between a patient's life events and early experience and the content of their symptomatology is often observed. In a recent study, 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 characteristics of stressful events prior to onset. In addition, Fowler (2000) reported that 14 of 26 patients in a treatment trial of cognitive behaviour therapy for psychosis had a trauma history, but that the presence of a trauma history can often be masked by the psychotic presentation. He also reports that careful assessment can reveal syntonic links between the nature of trauma and the content of hallucinations and delusions, and suggests that a trauma history may make patients more likely to develop a chronic illness or have drug-resistant symptomatology.

Ellason and Ross (1997) suggest that a type of schizophrenia characterized by positive symptoms is trauma-induced, and Kingdon and Turkington (1999) have suggested a subtype of schizophrenia that they term 'obsessional psychosis', which, they argue, includes patients with repetitive and distressing hallucinations that are 'associated with trauma, e.g. sexual abuse; the voice of the perpetrator may be heard and resisted because of the associated distress' (p. 69). However, there is little or no empirical support for such diagnostic distinctions to date.

The aetiology of psychosis is an area of continued debate, but there is clearly a

wealth of research studies that are consistent with a role for traumatic life experiences in the development of psychosis. However, some of the studies supporting this hypothesized relationship have small samples or are single case studies. The larger studies often have differing definitions and methodologies for assessing trauma in general, and childhood abuse in particular, and frequently rely on case-note data. However, similar criticisms apply to much of the literature regarding biological factors in the aetiology of psychosis, and such methodological difficulties suggest caution in interpreting results rather than dismissing them. The volume of studies with reasonable sample sizes and conservative definitions of abuse that have replicated findings in this area suggest that a relationship does exist between trauma and psychosis for some people. They specifically suggest that childhood abuse seems to be implicated in the development of psychosis for a substantial proportion of patients. More research is required before a decision can be made regarding how traumatic life events contribute to the development of psychosis. Read, Perry, Moskowitz, and Connolly (2001) have recently noted the similarities between the effects of traumatic life events on the developing brain and the structural and chemical abnormalities found in patients with a diagnosis of schizophrenia, and propose a traumagenic neurodevelopmental model of schizophrenia as a result.

Are psychosis and PTSD related types of reactions to trauma?

Just as the symptoms of psychosis can be categorized into either positive or negative clusters, so can those of PTSD (McGorry, 1991). Intrusive thoughts, images, and 'flashback' experiences, usually considered the hallmark symptoms of PTSD (Ehlers & Steil, 1995), show similarities with the hallucinations and delusions associated with psychosis. 'Flashbacks', or intrusive recollections, often appear to take the form of auditory, visual, tactile, and/or olfactory hallucinations and are often accompanied by paranoia (Allen, Coyne, & Console, 1997; Butler, Meuser, Sprock, & Braff, 1996; Heins *et al.*, 1990; Romme & Escher, 1989; Sansonnet-Hayden *et al.*, 1987; Shaner & Eth, 1989). Other similarities between PTSD and psychosis with regard to their positive symptoms include increased levels of arousal and hypervigilance (Stampfer, 1990). In addition, the disturbed sleep patterns and post-traumatic nightmares of PTSD may appear as the interrupted sleep often seen in psychosis (Kinzie & Boehnlein, 1989). Negative symptoms of PTSD, such as emotional numbing, affective constriction, estrangement from others, difficulty concentrating, feelings of derealization, detachment, and general neglect, can also be seen to overlap significantly with negative symptoms of psychosis (Butler *et al.*, 1996; Fowler, 1997; McGorry *et al.*, 1991; Shaner & Eth, 1989; Stampfer, 1990). Such symptom similarity has created controversy over the nature of the relationship between PTSD and psychosis. Indeed, the consideration of this similarity highlights the possibility that psychosis and PTSD may be similar entities, and part of a spectrum of responses to a traumatic event. Entertaining this possibility implies common links between the two disorders but also demands plausible explanations of why the occurrence of trauma might result in varying symptom presentations (or indeed classification). Possible common links and some of the factors that may mediate the development and maintenance of different symptom presentations or classifications following trauma are discussed below.

Are there common developmental processes?

Theoretical explanations for the common links between trauma and psychosis are sparse. Van der Kolk *et al.* (1996) argue that many of the more complex reactions to trauma, particularly early trauma, do not readily fall within a straightforward PTSD framework of alternating intrusions and numbing, and highlight the role of dissociative phenomena as important correlate and predictor of PTSD. Allen *et al.* (1997) have suggested that trauma-induced dissociation and dissociative detachment render individuals vulnerable to psychotic experience. They argue that dissociative detachment undermines the individual's grounding in the outer world, thereby hampering reality testing and rendering the individual with post-traumatic symptoms 'vulnerable to the nightmarish inner world' (p. 332). They also suggest that severe dissociative detachment renders individuals vulnerable to psychosis because it also robs them of internal anchors—the sense of being connected to one's body, a sense of self or identity, and one's own actions. The result may be not only impaired reality testing but also severe confusion, disorganization, and disorientation. This is clearly of relevance to psychosis, as biases or deficits in reality testing are central to many accounts of psychosis (e.g. Bentall, 1990). Spitzer, Haug, and Freyberger (1997) found that patients with a diagnosis of schizophrenia exhibited higher levels of dissociative phenomena than age and gender-matched non-patients. They also found that dissociative symptoms were significantly associated with hallucinations and delusions. Startup (1999) has also noted that the traits and experiences that are seen as defining both the schizophrenic and the dissociative disorders have been found to be present in continuously variable, non-pathological forms in the general population. In a recent study of 224 non-patients, Startup (1999) found moderately large correlations between the Dissociative Experiences Scale (DES) and both the Cognitive Disorganization and the Unusual Experiences subscales of the Oxford–Liverpool Inventory of Feelings and Experiences, and that these correlations were hardly affected when items with overlapping content were excluded. Hierarchical multiple-regression analyses showed that the measures of abuse accounted for small but significant proportions of the variance in both the DES and the Unusual Experiences subscale, but large proportions of the covariation between the measures of dissociative experiences and schizotypy remained unexplained. Merckelbach, Rassin, and Muris (2000) report that the association between dissociation and schizotypy has been repeatedly found in both clinical and non-clinical samples and found that this association could not be accounted for by fantasy proneness. Pope and Kwapil (2000) also found that, in 523 undergraduates, measures of psychosis proneness were positively correlated with dissociative experiences. However, these studies have often relied on self-report measures in non-patient populations, so their generalizability to clinical populations should be viewed with caution.

In a recent attempt to examine similarities in the psychological processes involved in PTSD and psychosis, Larkin, Frame, and Morrison (in preparation) explored the role of attributional style and the search for meaning following traumatic life events as a central mechanism in the development of both PTSD and persecutory delusions. A postal survey design was used to assess PTSD and delusional symptomatology in 51 emergency ambulance workers (their responses suggested that the likely rate of PTSD among this sample was 51%). The results suggested that in this sample, a self-blaming attributional style was associated with delusional symptomatology. Furthermore, those who met caseness for PTSD may hold delusional beliefs with more conviction and preoccupation as well as finding these beliefs more distressing than those who display

less symptomatology. Again, this was an analogue study focusing on psychotic-like experiences in a non-patient population, so the findings may not be generalizable to patients.

It appears possible that similar processes (such as dissociation or attributional style) may mediate the development of psychosis and/or PTSD following a traumatic event. However, this possibility requires a great deal more research, particularly using prospective research designs focusing on clinical populations, as the studies considered here are largely correlational and use non-clinical samples.

Are there common cognitive and behavioural maintenance processes?

It is widely recognized that the trauma survivor's search for meaning and appraisal of an event, particularly its impact on their beliefs about themselves, others, and the world (Ehlers & Steil, 1995; Lyons, 1991), is a major determinant of their subsequent adjustment (Janoff-Bulman, 1985; Lyons, 1991; Joseph, Yule, & Williams, 1993). Similarly, several authors have observed an association between how people explain and respond to hearing voices, and suggest that beliefs about voices mediate distress and disability (Chadwick & Birchwood, 1994; Morrison, 1998a; Romme & Escher, 1989). Maher (1974) has also suggested that delusional beliefs may be a search for meaning triggered by the presence of anomalous experiences associated with psychosis; Garety, Kuipers, Fowler, Freeman, and Bebbington (2001) have recently suggested a similar approach. This suggests that there may be common psychological processes involved in the development and maintenance of both PTSD and psychosis. These are speculatively examined below with particular reference to recent cognitive theories of PTSD (Ehlers & Clark, 2000), generic psychological dysfunction (Wells & Matthews, 1994), and psychosis (Morrison, 2001).

Ehlers and Clark's (2000) cognitive model of persistent PTSD suggests that a key feature of persistent PTSD is that individuals who do not recover naturally are characterized by idiosyncratic negative appraisals of the traumatic event and/or its sequelae that have the common effect of creating a sense of serious current threat. This threat can be either external (e.g. the world is a dangerous place, people are dangerous) or internal (e.g. a threat to one's view of oneself as a capable/acceptable person who will be able to achieve life's important goals). The sense of current threat that is maintained by these negative appraisals is accompanied by intrusions, arousal, and strong emotions such as anxiety, anger, shame, or sadness. These negative appraisals also prompt a series of dysfunctional cognitive and behavioural responses that have the short-term aim of reducing distress but have the long-term effect of preventing cognitive change and therefore maintain the disorder. This explanation is supported by several cognitive models of PTSD that suggest that avoidance/emotional numbing or negative symptoms may be used as a defence against the distress caused by intrusive phenomena and therefore creates a short-term reduction in distress (Ehlers & Steil, 1995; McFarlane, 1992; Spurrell & McFarlane, 1995). However, this strategy is ultimately counterproductive as avoidance is thought to play a key role in maintaining intrusions (Ehlers & Steil, 1995).

A cognitive approach to the understanding of positive psychotic symptoms has been outlined by Morrison (2001). It is argued that many positive psychotic symptoms (such as hallucinations and delusions) can be conceptualized as intrusions and culturally unacceptable interpretations of 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 (including positive beliefs about psychotic experiences), 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). Examples of such misinterpretations would include an individual interpreting intrusive impulses as evidence of alien control over their body or interpreting auditory hallucinations as evidence that the devil is trying to make kill their neighbour. Many of the components of this model are clearly derived from current conceptualizations of anxiety disorders, including Wells and Matthews' (1994) self-referent executive functioning (SREF) model and the model of PTSD described above. It is argued that the main difference that appears to constitute the classification of such interpretations as psychotic seems to be their cultural unacceptability. It is likely that traumatic experiences will contribute to the development of faulty self and social knowledge and the (culturally unacceptable) 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). It is possible that such unusual interpretations develop as functional survival strategies in response to trauma, which is consistent with the relationship between positive beliefs about psychotic experiences and their occurrence (Morrison, Wells, & Nothard, 2002). For example, a child that is sexually or physically abused could adopt hypervigilance for threat and suspiciousness of others as a way of minimizing the risk of further abuse.

Thus, both disorders are characterized by intrusions (and the subsequent interpretation of these, or the 'search for meaning') and avoidance or negative symptoms. In PTSD, the interpretation of intrusive symptoms such as flashbacks is seen as central to the maintenance of the disorder (Ehlers & Clark, 2000), just as, in psychosis, the (culturally unacceptable) interpretation of intrusions such as hallucinations and delusional beliefs is viewed as similarly important with respect to maintenance (Morrison, 2001).

A common interpretation of intrusions in both of these disorders is one of going mad. Negative social stereotypes of 'madness' portray people with serious mental disorders as incomprehensible, out of control, threatening to society, inherently 'odd', and incapable of functional living (Birchwood *et al.*, 1993). Contrary to public belief, loss of insight is one of the last changes to occur in the phenomenological experience of acute psychosis (Birchwood *et al.*, 1992). Seventy per cent of those with psychotic diagnoses report a 'fear of going crazy' as the most common out of 30 prodromal symptoms assessed by Hirsch and Jolley (1989). As such, the endorsement of negative stereotypes of mental illness may heighten the traumatic quality of the psychotic and/or hospital experience, via its impact on the individual's view of self, others, and the world (Estroff, 1989; Jordan, 1995; Molvaer, Hantzi, & Papadatos, 1992). An interesting parallel can be found in the study by Dunmore, Clark, and Ehlers (1999), who found that interpreting initial post-trauma symptoms as a sign of impending madness distinguished patients with a diagnosis of PTSD from those without and recovered patients from those with persistent PTSD. Certainly, Jackson (2000) reported that psychotic patients with a sealing-over recovery style (those who want to forget about psychosis and 'put it behind them') exhibited a greater avoidance than those with an integrating recovery style (those who seek to make sense of their psychosis). Therefore, it is likely that interpretations of impending madness may be involved in both psychosis and PTSD.

Other maintenance processes have been found to be common to both diagnostic groups. Wells and Matthews, (1994) SREF model of emotional disorders would also predict that positive and negative procedural beliefs regarding the allocation of attention and the benefits or drawbacks of coping strategies (including thought control and dissociation) would be involved in the development and maintenance of both disorders. Selective attention has been implicated in patients experiencing persecutory delusions (Bentall & Kaney, 1989) and patients with PTSD (Thrasher, Dalgleish, & Yule, 1994). Safety behaviours designed to prevent feared catastrophes but that may also prevent disconfirmation of problematic interpretations have been identified in both patients with a diagnosis of schizophrenia (Garety *et al.*, 2001; Morrison, 1998b) and patients with PTSD (Ehlers & Clark, 2000). Similarly, both patients with PTSD (Reynolds & Wells, 1999) and patients with a diagnosis of schizophrenia (Morrison & Wells, 2000) have been found to use more dysfunctional thought control strategies (particularly punishment and worry) than non-patients. Biases in autobiographical memory have also been found in both PTSD patients (Brewin, 1998; McNally, 1997) and psychotic patients (Baddeley, Thornton, Chua, & McKenna, 1996; Feinstein *et al.*, 1998). Environmental factors have also been shown to have an influence on both disorders. For example, expressed emotion in family members has also been linked to symptomatology and/or relapse in both patients with a diagnosis of schizophrenia (Butzlaff & Hooley, 1998) and PTSD patients (Tarrrier *et al.*, 1999).

Recently, Mueser, Rosenberg, Goodman, and Trumbetta (2002) have proposed a model, which is an extension of the stress-vulnerability model, in which PTSD is hypothesized to mediate the negative effects of trauma on the course of serious mental illness. Their approach views PTSD and psychosis as distinct disorders that interact with each other resulting in exacerbation of symptoms. They suggest that PTSD influences severe mental-health problems such as psychosis both directly, through the effects of specific PTSD symptoms including avoidance, overarousal, and re-experiencing the trauma, and indirectly, through the effects of common correlates of PTSD such as retraumatization, substance abuse, and difficulties with interpersonal relationships. This identifies further common maintaining factors.

An integrative approach

It is possible that it is the cultural acceptability of the intrusions and/or the interpretation of these intrusions, often (but not always) in the form of an external appraisal (as has been noted by Bentall, 1990 and Garety *et al.*, 2001), in combination with positive beliefs about psychotic experiences (Morrison *et al.*, 2002), that mediates whether someone receives a diagnosis of PTSD or psychosis. Thus, if someone reports that they hear voices of an unknown, real man criticizing them in the third person (e.g. 'She is ugly') and does not make a connection between these distressing experiences and previous sexual abuse, it is highly likely that this would be viewed as a first-rank symptom of schizophrenia (Schneider, 1959). However, should the same experience be interpreted as an intrusive memory that sounds real, but is in fact connected to sexual-abuse experiences in the past, then a diagnosis of PTSD or dissociative disorder is more likely. Thus, the transparency of the links between symptom content and life events to both patient and professional may determine which diagnosis is received. It is also possible that positive beliefs about psychosis (for example, 'Hearing voices is reassuring and provides company') will be predictive of psychotic experiences, and this is consistent with the emergence of psychosis as a coping strategy for trauma or

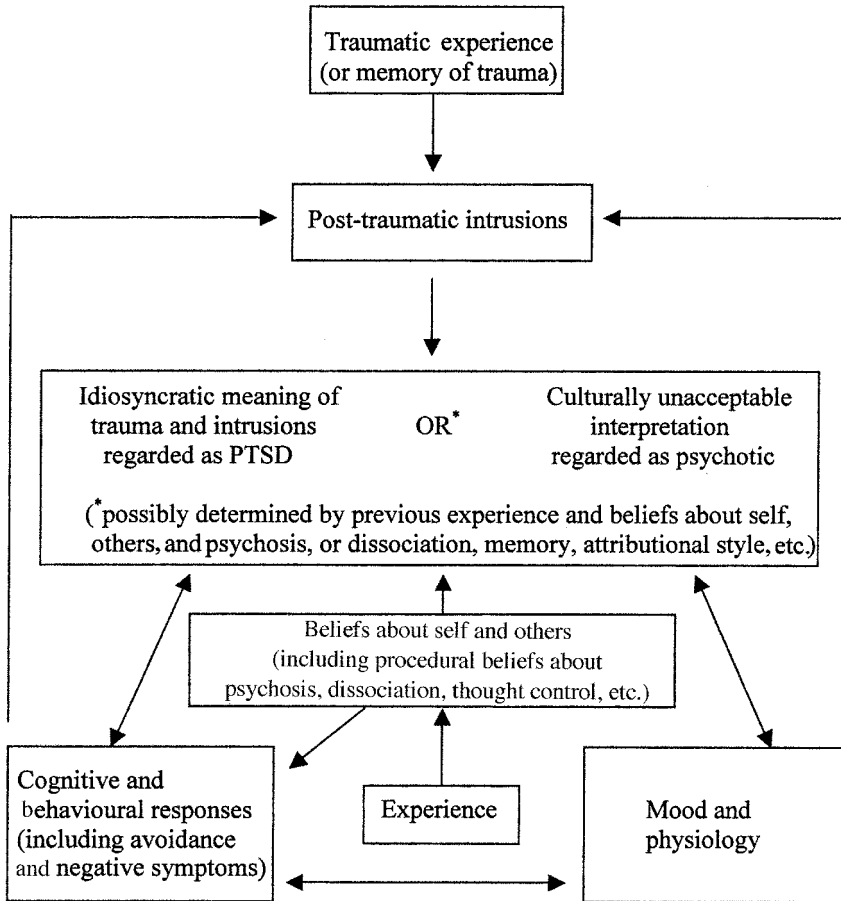


Figure 1. Integrative model of trauma and psychosis.

memories of trauma (Romme & Escher, 1989). Negative symptoms common to both disorders, such as emotional numbing, lack of expression of affect, and social withdrawal could be viewed within such a framework as cognitive and behavioural responses designed to facilitate coping. An integration of Ehlers and Clark's (2000) model of PTSD, Wells and Matthews' (1994) SREF model, and Morrison's (2001) model of psychosis (represented graphically in Fig. 1) may help to explain the link between trauma and psychosis for those patients where trauma appears to be indicated in the aetiology of their psychosis. For example, if a person was physically abused within their home as a child, and sexually assaulted by a stranger wearing red, they may develop beliefs about themselves being vulnerable and the world and others being dangerous. They may develop paranoia/suspiciousness and dissociation as strategies for avoiding further abuse and coping with their distressing intrusions. If they continue to use these strategies in adulthood, or they are reactivated by a similar life event in adulthood, then they are likely to be viewed as culturally unacceptable, which may isolate the person further. Their verbal post-traumatic intrusions may become elaborated and, in combination with dissociative phenomena (and consequent reality-testing difficulties), become experienced as voices. They may also generate culturally unacceptable

explanations for intrusions such as body sensations; for example, suspiciousness and dissociative phenomena may lead them to believe that their palpitations are being induced by a third party. These positive symptoms are likely to be maintained by factors such as social environment (e.g. a critical family or a current abusive relationship), safety behaviours (e.g. avoiding eye contact, planning emergency escape routes), thought-control strategies (e.g. suppressing concerns about being attacked), and selective attention (e.g. being vigilant for men wearing red).

In summary, it is likely that traumatic experiences contribute to the development of faulty self and social knowledge and the (potentially psychotic) nature of interpretations of intrusions. (For instance, sexual or physical abuse may lead people to believe that they are vulnerable, others cannot be trusted, and the world is dangerous, which would make paranoid interpretations of ambiguous events more likely.) Problematic, culturally unacceptable interpretations, and the associated distress and disability, are maintained by cognitive, behavioural, emotional, and physiological responses and the current environment. Such difficulties may be triggered by adult memories of childhood trauma, in addition to current trauma. This integrative approach may be sufficient to explain the link between trauma and the experience of psychosis, at least for some people. This may amount to suggesting that the diagnostic confusion between PTSD and psychosis is an artefact of an invalid classification system that attempts to force human experience and intrapersonal and interpersonal processes into discrete boxes, when a continuum between normal and abnormal experiences (including reactions to trauma) is the reality.

If, however, PTSD and psychotic disorders do exist as differing entities, then some variable must mediate the diagnostic outcome. There are many different possibilities as to how the initial and subsequent reactions to a traumatic event are mediated, and some speculation may be useful in highlighting topics for further research. It is possible that this is a biological process or structure; however, Turkington (1999) and Read *et al.* (2001) have reviewed the literature regarding consistent structural changes found in the brains of patients with a diagnosis of schizophrenia and those associated with trauma, and found them to be very similar. It is as yet unclear whether the structural changes observed in the brains of people with PTSD are a consequence of exposure to trauma or a risk factor for psychiatric complications following trauma (Stein *et al.*, 1997). It may be that environmental factors (e.g. social-support structures or the reaction of health services) are what mediate this process. It is also possible that some cognitive process or structure such as attributional style or pre-existing beliefs (especially positive beliefs about psychotic experiences) may mediate the development of PTSD or psychotic symptoms. For instance, it is possible that if people make an internal attribution for the traumatic event, they will develop PTSD as self-blame frequently is associated with PTSD (Janoff-Bulman, 1979), whereas if they make an external attribution for the traumatic event, they will develop psychotic symptoms as external attributional style has been implicated in both delusions (Bentall, Kinderman, & Kaney, 1994) and hallucinations (Bentall, 1990). It is also possible that the shattered assumptions that are a common consequence of trauma (Janoff-Bulman, 1979) increase the likelihood of developing culturally unacceptable interpretations for events, as previous reference points for making sense of life have been lost. Another possibility is that it is what people do during and after trauma (e.g. use of social supports, dissociation, information processing/encoding of trauma memory) that determines subsequent symptomatology. Dunmore *et al.* (1999) argue that the way information is encoded in memory will have an impact on how it is subsequently retrieved or recalled,

and cite evidence that people with PTSD have incoherent memories for the traumatic event. They further suggest that victims, who experience mental confusion during the occurrence of trauma, may be more likely to have encoded the memory at a lower level (Dunmore *et al.*, 1999). Bremner and Narayan (1998) suggest that the developmental stage of the victim when they experienced trauma could influence the way in which the traumatic memory is encoded or stored. It may be that earlier onset of trauma yields increasingly incoherent and fragmented memories that are at greater risk of becoming distorted, elaborated, and disconnected from the traumatic event itself. This may render the individual more likely to experience that retrieval as psychotic hallucinations (and be diagnosed accordingly) as opposed to an intrusive recollection of trauma.

It is possible that a vicious circle can develop where traumatic events could precipitate a psychotic episode, which in turn could cause PTSD in relation to the psychotic symptoms, which may further exacerbate psychosis (this is similar to the interactive model proposed by Mueser *et al.*, 2002). The application of Teasdale and Barnard's (1993) interacting cognitive subsystems approach to the conceptualization of psychotic relapse proposed by Gumley, White, and Power (1999) suggests that changes in experience (including body state and visual information) can trigger implicational meaning directly and thus contribute to relapse. It is possible that traumatic memories or flashbacks of acute psychotic episodes may access implicational meaning in this way and result in a recurrence of the psychotic symptoms. The quote (reproduced earlier) from a patient, cited by Jackson and Iqbal (2000), certainly demonstrates the potential for such an exacerbation.

In view of the literature regarding the similarities between the symptoms and processes involved in PTSD and psychosis, the hypothesis that they are both part of a spectrum of reactions to trauma, sharing developmental and maintenance processes, seems to be one that may prove useful in advancing our understanding of the two disorders. However, there is clearly a need for a much larger body of hypothesis-driven research before any firm conclusions can be drawn.

Discussion

It can be seen that there are several different possible relationships between the experiences of trauma and psychosis. This paper has explored suggestions that the experience of psychosis can precipitate the development of PTSD (and post-traumatic stress symptoms), but also that the experience of trauma can, for some people, lead to the development of psychosis. It also considers the hypothesis that psychosis and PTSD are similar entities, and part of a spectrum of reactions to trauma. The most probable explanation of the relationships between trauma and psychosis is that of all of the above are possible; some psychotic patients will develop PTSD in response to their psychosis, some people will develop psychosis in the first place as a result of traumatic experiences, some may develop both, and for some people a vicious circle may develop between their psychotic experiences and their PTSD symptoms. It is also possible that some shared mechanism (such as dissociation, attributional style or interpretations of intrusions) may be responsible for mediating the development or maintenance of the disorders.

The possibility that psychosis and PTSD are part of a spectrum of reactions to trauma is, in fact, similar to proposals that suggest there is a distinct subtype of psychotic disorders that is trauma-induced, as would be argued by Ellason and Ross (1997),

Kingdon and Turkington (1999), and Ross *et al.* (1994). This could be with the trauma functioning as a stressor in a stress-vulnerability model such as that of Zubin and Spring (1977), as has been suggested by Goodman *et al.* (1997) to precipitate the onset of schizophrenia. Indeed, this could also be due to a complex interaction of biological, social, cognitive, and developmental mediating variables such as those discussed above. Alternatively, trauma could lead to the development of psychosis in a more idiosyncratic manner, involving the generation of culturally unacceptable appraisals for intrusions and the responses to such interpretations. Within this framework, the intrusions themselves could be trauma-related, or the beliefs about self and world that affect interpretations could have been influenced by traumatic life experiences.

Methodological issues

There are several methodological issues, which are common to many of the studies described in this review. Future research could benefit from taking such factors into consideration. The sample size of many of the studies could be larger, as many of the clinical studies are on small samples or are descriptions of single cases. Effort should be made to improve the generalizability of the results by ensuring that clinical samples are well defined and that diagnoses are made using valid and reliable methods (such as the Structured Clinical Interview for DSM-IV), and ideally randomly selected. Studies that find important results in non-clinical samples should be replicated using clinical samples.

The measurement of traumatic experience is also problematic. Ideally, multiple measures that include more objective methods such as report from significant others or interview-based measures in addition to self-report would be desirable. Reliance on case-note data should be avoided. Another potential problem is the ability of patients to respond appropriately to items assessing reactions to trauma when they have experienced more than one trauma; it may be extremely difficult to accurately rate flashbacks about a psychotic episode if someone also experiences flashbacks about a sexual assault (and vice versa). This problem is likely to be even more pronounced for the arousal symptoms of PTSD. Another measurement problem is the result of the similarity between symptoms of PTSD and psychosis; for instance, voices commenting on a past trauma may be indistinguishable from flashbacks on some measures, and the same is true for negative symptoms such as flat affect and emotional numbing. The use of multiple measures and interview-based methods may help to overcome such problems. Also, the use of diagnostic variables and/or symptom variables in different studies makes it difficult to draw robust conclusions from the literature as a whole. Some consistency in measures and approach (symptom-focused or diagnostic) would be useful for the interpretation of future research.

Clinical implications

There are several clinical implications of these possible relationships between trauma and psychosis, and for many of these, there is currently sufficient evidence to support their implementation. It is important to assess patients with psychotic disorders for comorbid PTSD in order to ensure that it is detected and treated. For example, Mueser *et al.* (1998) found that 43% of patients with severe mental illness qualified for a diagnosis of PTSD (DSM-IV; American Psychiatric Association, 1994), yet only 2% had actually received such a diagnosis in their records. It has also been suggested that, given

the number of abuse survivors with diagnoses of psychotic disorders, routine inquiry regarding sexual abuse should be introduced in services for such patients (Read, 1997). In addition, the services that psychotic patients receive could be designed with the minimization of trauma in mind. This could include alternatives to hospital admission, provision of normalizing information regarding the prevalence and incidence of positive symptoms in the general population, and education regarding common symptoms of trauma and the prevalence of PTSD in response to psychosis. Services should also give some thought to more structural aspects of service delivery; for instance, patients may fail to attend appointments offered to them at a site that is associated with past trauma (be it hospitalization or experience of psychosis). It is worth considering that health professionals would be unlikely to expect disaster victims to attend their first appointment at the scene of the disaster.

Psychological interventions for psychotic symptoms may be informed by equivalent treatments for PTSD, and it may be that cognitive behavioural approaches to PTSD such as imaginal exposure and reappraising the meaning of the traumatic event may be applicable to trauma-induced psychosis; indeed, Turkington (1998) reported a case study where this had been done successfully. Fowler (2000) has also suggested that helping a patient to clarify whether a psychotic symptom is a memory or not and, if so, assisting them in moving from externalizing to internalizing that memory can be useful. Thus, reattribution of psychotic experiences to an internal source may reduce distress and impairment. Assessment and formulation-based intervention should incorporate potential maintaining factors such as the interpretation of intrusions, thought-control strategies, and safety behaviours, as suggested by Morrison (1998b). It may also be appropriate to re-examine the utility of a categorical diagnostic system given the large amount of apparent overlap between the two syndromes (especially given the high degree of stigma attached to a diagnosis of a psychotic disorder).

Summary

There are clearly many different factors that could be responsible for the symptoms that occur in response to a traumatic event. It is likely that cognitive, behavioural, physiological, affective, and environmental factors, as proposed in this paper, all contribute to the development of PTSD and psychotic disorders; there are presumably multiple pathways to both. However, it does seem that at least a significant proportion of psychotic disorders do arise as a response to trauma, and that PTSD-like symptoms can be developed in response to people's experience of psychotic episodes. Clearly, more research studies that overcome the methodological difficulties identified by the current review are required before a more detailed understanding of the relationships between trauma and psychosis can be gained.

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