

## NEUROLOGICAL SIGN



Large Enclosure by Caspar David Friedrich, c. 1832. Gemaeldegalerie, Dresden.

# Déjà vu

**Charlotte Warren-Gash and Adam Zeman**

Department of Clinical Neurosciences, Western General Hospital, Crewe Road, Edinburgh, UK; Email: [az@skull.dcn.ed.ac.uk](mailto:az@skull.dcn.ed.ac.uk)  
*Practical Neurology*, 2003, **3**, 106–109

**D**éjà vu is a familiar phenomenon in neurology, psychiatry, and everyday life. Assessment of its significance is helped by an acquaintance with the ambiguities of the term, and with the epidemiology, disease associations and physiology of the experience.

### WHAT IS DÉJÀ VU?

Déjà vu means, literally, 'already seen'. In colloquial English it is often used indiscriminately to refer to familiar events and experiences. In its more technical or medical context it refers to the disconcerting sense that one's current experience is familiar when, in fact, it is novel. This phenomenon has been described repeatedly in literature, for example by Charles Dickens:

'We have all some experience of a feeling which comes over us occasionally, of what we are saying or doing having been said or done before, in a remote time – of our having been surrounded, dim ages ago, by

the same faces, objects and circumstances – of our knowing perfectly what will be said next, as if we suddenly remembered it' (Dickens 1849).

In the late nineteenth century, Hughlings Jackson's patient Dr Z described the 'reminiscences' that occurred during his temporal lobe seizures along the following lines:

'The [feeling of] recollection is much more instantaneous, much more absorbing, more vivid and for the moment more satisfactory than [normal recall], as if filling up a void I had previously in vain sought to fill. At the same time ... I am dimly aware that the recollection is fictitious and the state abnormal' (Jackson 1888).

Neppe, one of the fathers of modern déjà vu research, defined déjà vu as a, 'subjectively inappropriate impression of familiarity for a present experience [in relation to] an undefined past' (Neppe 1983). The term 'experience' is delib-

erately vague to encompass the wide range of circumstance that can provoke 'déjà vu' (places visited, actions performed, tastes encountered, etc.).

Patients, of course, do not study research definitions and so they use our technical terms loosely. In addition to using the term 'déjà vu' colloquially, patients attending neurology clinics sometimes use the phrase to describe recurrent hallucinations or vivid dream-like imagery. This is understandable: hallucinations and intrusive imagery are disconcerting, and if they are recurrent they become familiar, thereby combining the two key features of the experience of déjà vu. We have encountered patients with vivid visual imagery due both to temporal lobe epilepsy and to narcolepsy, who initially described the imagery in terms of 'déjà vu' (Zeman *et al.* 2001).

### HOW COMMON IS DÉJÀ VU IN THE GENERAL POPULATION?

Many, probably most, of us experience déjà vu at some time. Several studies suggest that it is a common experience, uninfluenced by gender, which affects between 30 and 96% of the population (Sno & Linszen 1990). Déjà vu occurs more frequently in younger people, its prevalence increasing with education and skill of occupation (Sno & Linszen 1990). Likely predisposing factors include illness, exhaustion, emotional trauma and the use of hallucinogenic drugs (Sno & Linszen 1990).

### DIFFERENTIAL DIAGNOSIS

Déjà vu is clearly not always pathological. As a rule it is a transient experience, free of associated symptoms, or any impairment of judgement. However, several authors have described a 'pathological' form of déjà vu that may point towards neurological or psychiatric disease.

Firstly, déjà vu is sometimes a symptom of temporal lobe epilepsy. Hughlings-Jackson recognized this association, identifying déjà vu and hallucinatory memories as the key elements of the 'dreamy state' which accompanies some temporal lobe seizures (Jackson 1888). With the proviso that epileptic déjà vu probably lasts longer and occurs more often, the experience of déjà vu in itself is similar in both the pathological and the minor or 'normal' forms; pathological déjà vu is mainly distinguished by its *associated* features, in other words, the 'company it keeps' (Neppe 1983). Thus epileptic déjà vu is more likely than normal déjà vu to be accompanied by symptoms of 'dissociation',

### DISSOCIATION

In dissociative states the integration of experience fails and we lose our normal sense of contact with our emotions, bodies, actions, thoughts or surroundings. We feel 'beside ourselves', as if we no longer owned our own psychological processes, or as if they, or our environment, had become unreal. 'Depersonalisation' and 'derealisation' are common dissociative states, causing a sense of estrangement from ourselves or our surroundings respectively. Like déjà vu, dissociation can be a normal occurrence or symptomatic of psychiatric or neurological disorders.

such as depersonalization and derealization (see box), by strong emotion, particularly fear, and by physical sensations such as an epigastric aura or olfactory hallucinations (Neppe 1983). An eye-witness description of a subsequent complex partial or secondary generalized seizure secures the diagnosis.

Although the experience of syncope is often accompanied by dream-like visual and auditory hallucinations, and a sense of detachment sometimes amounting to an out-of-body experience, déjà vu appears to be very uncommon (Lempert *et al.* 1994; Benke *et al.* 1997). However, anecdotal evidence suggests that déjà vu may occur in the context of presyncope very occasionally.

Secondly, déjà vu has a broad psychiatric differential diagnosis. Indeed, it can occur prominently in most major psychiatric disorders, including anxiety, depression, dissociative disorders and schizophrenia (Richardson & Winokur 1967). Once again, the clinical context, rather than any peculiarity of the experience of déjà vu itself, is likely to suggest the diagnosis. This underlines the importance of attempting at least a basic psychiatric assessment in patients attending neurology clinics. The value of the features associated with epileptic déjà vu (frequency, duration and associated symptoms) in distinguishing 'epileptic' from 'psychiatric' déjà vu is uncertain.

### ANATOMY AND PHYSIOLOGY OF DEJA VU

The precise anatomical basis of déjà vu has been the subject of some debate. Mullan and Penfield used electrical stimulation, and recording of spontaneous seizures, during temporal lobe resection for epilepsy, to identify the temporal neocortex as the primary culprit (Mullan & Pen-

field 1959). Halgren (1978) and Fish *et al.* (1993) evoked déjà vu sensations in some patients as part of an epileptic 'dreamy state' via electrodes implanted into superficial and deep temporal structures, specifically the medial temporal lobe and especially the amygdala (Halgren *et al.* 1978). In patients with intractable temporal lobe epilepsy the occurrence of déjà vu seems to be associated with an abnormal amygdala (Van Paesschen *et al.* 2001). Recent work by Bancaud and colleagues has localized the neural networks involved in ictal déjà vu circuits more precisely to the anterior hippocampus, amygdala and superior temporal gyrus (Bancaud *et al.* 1994).

On this anatomical background, psychological, psychodynamic and mystical hypotheses have been proposed to explain déjà vu. These range from interhemispheric asynchrony, to confusion of a single detail with the whole, to theories of reincarnation and Freudian repression. Conway has described déjà vu as a 'recollective experience for the present' in which current sensory experiences are mislabelled as memories (Conway 2001). During perception, sensory information passes to auditory and visual association cortices in the temporal lobes. Information also passes in the opposite direction as long-term memories are brought to conscious recall. Bancaud has suggested that in epileptic déjà vu, information passing from sensory regions towards the temporal lobes meets and is sculpted by neuronal activity moving in the other direction, away from an epileptic focus (Bancaud *et al.* 1994).

### ASSESSING DÉJÀ VU

(Figure 1) If patients mention déjà vu, or a symptom suggestive of it, in the course of their history, ask for clarification – what do they mean? Are they merely describing something that has happened before (colloquial déjà vu) or are they describing the distinctive and disconcerting experience of 'false familiarity' that characterizes true déjà vu? Could it be something different again, such as intrusive imagery or hallucinations?

If the clarification suggests that they are indeed describing true déjà vu, consider the differential diagnosis. Are there associated features that might point to temporal lobe epilepsy – symptoms of dissociation, fear, epigastric aura, olfactory hallucination, loss of awareness or a witnessed seizure? Or are there features of psychiatric disorder, in particular anxiety, depression or psychosis?

Details of the history will generally indicate the direction further investigation (if any) should

take. Where frequent and intense déjà vu occurs in isolation, without any additional clinical pointers, assessment should include a cardiovascular and neurological examination, ECG, EEG and brain imaging. If déjà vu is the sole symptom, and the investigations are entirely normal, one can but wait and see without burdening the patient with a diagnosis that may turn out to be wrong.

### CONCLUSIONS

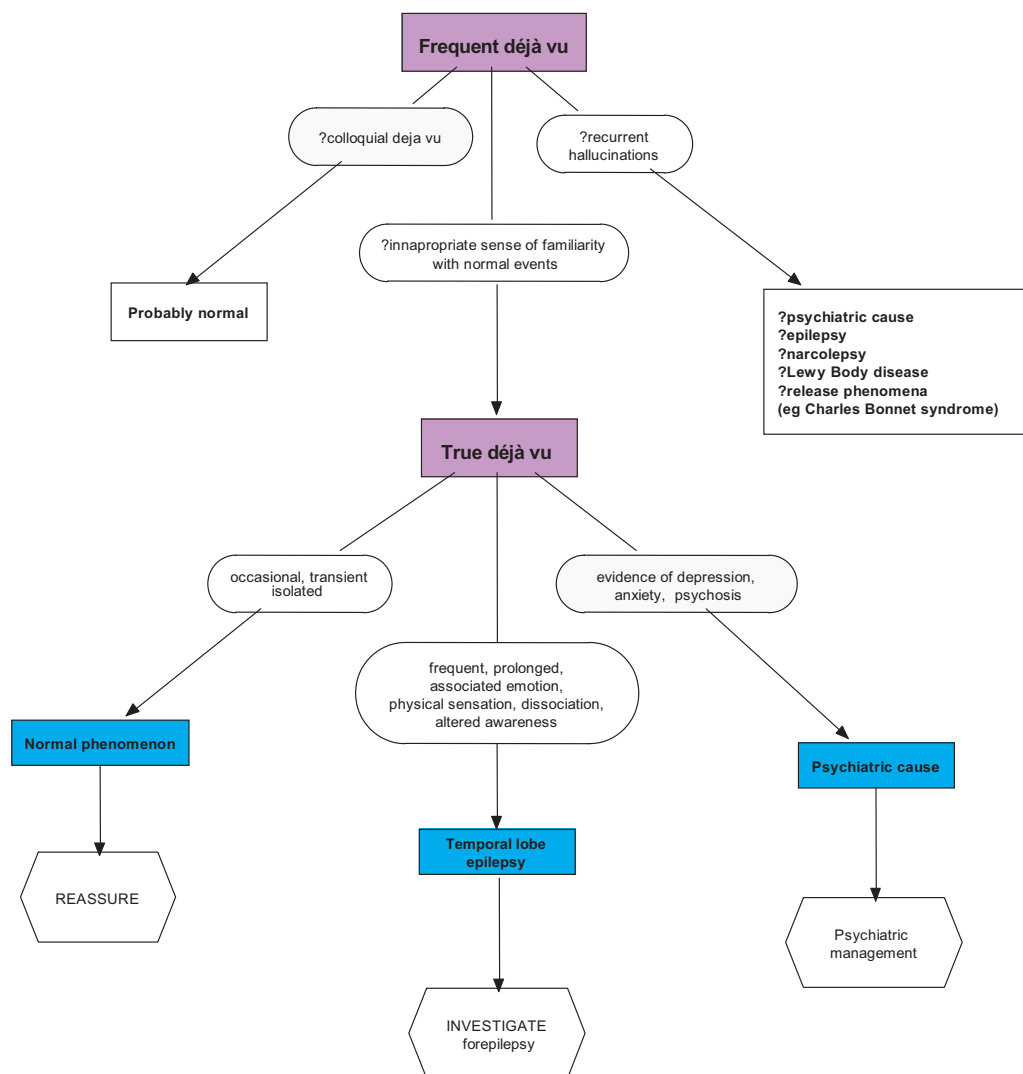
In summary, 'déjà vu' is an ambiguous term. 'True' déjà vu is a common event, but the same phenomenon can be symptomatic of temporal lobe epilepsy or psychiatric disorder. If so, its origins are usually betrayed by 'the company it keeps'.

### ACKNOWLEDGEMENTS

We thank Jon Stone, Mike Sharpe and Charles Warlow for their helpful comments.

### REFERENCES

- Bancaud J, Brunet-Bourgin F, Chanvel P, Hargren E (1994) Anatomical origin of déjà vu and vivid "memories" in human temporal lobe epilepsy. *Brain*, **117**, 71–91.
- Benke T, Hochleitner M & Bauer G (1997) Aura phenomena during syncope. *European Neurology*, **37**, 28–32.
- Conway M (2001) A sensory-perceptual episodic memory and its context: autobiographical memory. *Phil Trans R Soc Lond*, **356**, 1375–84.
- Dickens C (1849) *The Personal History of David Copperfield*. Reprinted in 1985 by Penguin, London, p. 630.
- Fish DR, Gloor P, Querney FL, Olivier A (1993) Clinical responses to electrical brain stimulation of the temporal and frontal lobes in patients with epilepsy. *Brain*, **116**, 397–414.
- Halgren E, Walter RD, Cherlow DG *et al.* (1978) Mental phenomena evoked by electrical stimulation of the human hippocampal formation and amygdala. *Brain*, **101**, 83–117.
- Jackson JH (1888) On a particular variety of epilepsy. *Brain*, **11**, 179–207.
- Lempert T, Bauer M & Schmidt D (1994) Syncope: a videometric analysis of 56 episodes of transient cerebral hypoxia. *Annals of Neurology*, **36**, 233–7.
- Mullan S & Penfield W (1959) Illusions of comparative interpretation and emotion. *Archives of Neurological Psychiatry*, **81**, 269–84.
- Neppe VM (1983) *The psychology of déjà vu. have I been here before?* 1st edn., Chapters. 2, 8 and 9.
- Sno HN & Linszen DH (1990) The déjà vu experience: remembrance of things past? *American Journal of Psychiatry*, **147**, 1587–95.
- Richardson TF & Winokur G (1967) Déjà vu in psychiatric and neurosurgical patients. *Archives of General Psychiatry*, **17**, 622–5.
- Van Paesschen W, King MD & Duncan JS & Connelly A. (2001) The amygdala and temporal lobe simple partial seizures: a prospective and quantitative MRI study. *Epilepsia*, **42**, 857–62.
- Zeman A, Douglas N & Aylward A (2001) Narcolepsy mistaken for epilepsy. *British Medical Journal*, **322**, 216–8.



**Figure 1** The clinical assessment of déjà vu.

### EPILEPTIC DÉJÀ VU: SOME EXAMPLES

A 36-year-old woman was first diagnosed with epilepsy aged 23. She experienced two types of seizures: firstly minor auras every day in which she had a brief horrible sensation of déjà vu which might be triggered by smells, songs, music and programmes on the television but could occur in any situation anywhere. These lasted a minute or more, during which she had intense feelings of familiarity for the whole (rather than part) of the experience which seemed almost the same as some unidentifiable past occasion. During her déjà vu she had the sense that her experience was unreal, although she felt no sense of depersonalisation. Like the majority of epileptic patients, she could distinguish epileptic déjà vu from 'normal' déjà vu – 'it is different with epilepsy: worse and really frightening'. Indeed her predominant emotion was one of fear. Afterwards she felt empty, sick and scared. Once a month it progressed to a more major attack 'like the worst horror film you could imagine', in which she sat and stared, crying 'I am terrified' repeatedly. These attacks sometimes second-

arily generalised into tonic-clonic seizures. She had no interictal symptoms of anxiety or depression. EEG revealed a right fronto-temporal lobe focus, and MR scanning showed atrophy of the right hippocampus and temporal lobe.

A 30-year-old lady's epileptic déjà vu episodes were ushered in by a sense of pleasant anticipation. This was accompanied by a feeling of pressure at the top of her nose, a quickening of the heartbeat, a thumping sensation in her head, pulsating vision and a sense of dizziness and detachment. She felt 'like I am not there' and had a metallic taste in her mouth. It lasted a minute or so and in the aftermath she often coughed.

Another patient with temporal lobe seizures, noticed a tingling feeling whenever he had déjà vu; another described a sensation washing over her, working forward from the back of her head to the front as she experienced déjà vu.

A 39 year old woman felt out of control and strangely detached from her surroundings. 'With this intense déjà vu feeling I felt I was spiralling off into some other plane of existence.'



## Déjà vu

Charlotte Warren-Gash and Adam Zeman

*Pract Neurol* 2003 3: 106-109

doi: 10.1046/j.1474-7766.2003.11136.x

---

Updated information and services can be found at:  
<http://pn.bmj.com/content/3/2/106>

---

*These include:*

### **Email alerting service**

Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

---

### **Notes**

---

To request permissions go to:  
<http://group.bmj.com/group/rights-licensing/permissions>

To order reprints go to:  
<http://journals.bmj.com/cgi/reprintform>

To subscribe to BMJ go to:  
<http://group.bmj.com/subscribe/>