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Déjà Vu



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Abstract

Déjà vu is a fleeting and subjective memory phenomenon where one has the feeling of familiarity at the same time as being aware this feeling is false. The contemporary understanding of déjà vu centers on a “conflict” between memory evaluations—recognizing something as familiar but knowing it should not be. Déjà vu is thus indicative of healthy memory functioning: it operates to raise to consciousness mismatches in memory processing. The various methodological approaches and theoretical explanations are reviewed in this chapter. The overarching principle is that it should be possible to incorporate explanations of this unusual and infrequent phenomenon into current theories of the functioning of memory.

Déjà Vu

Déjà vu is an infrequent memory phenomena which is characterized by its fleetingness and intense subjectivity. In daily life, the phrase déjà

vu is also used to express a sort of ennui or any kind of repetition (e.g., of a significant sporting event: “Déjà vu for Liverpool” on the BBC website 17 February, 2017, to describe the team’s run of form, losing successive football matches). Lazerson (1994) reviews the use of déjà vu as a term in common parlance, noting that the first dictionary definitions emphasize an illusory feeling, but by the 1950s the term had entered nontechnical English, where its usage was largely pejorative meaning “tiresome familiarity” (p. 285), giving the example: “Two can lunch on dreary déjà vu for \$47 in our town’s temples of serious French cooking.”

This entry focusses on the original and scientific sense of the term: a personal memory experience. It is likely that the use of the term to express or emphasize repetition in literature, the media, and society is something that would be of interest to scholars of memory studies, but to the best knowledge no research on this aspect of déjà vu exists. For the purposes of this entry, déjà vu is a temporary glitch that exposes the workings of the cognitive system. The current theoretical views of the phenomenon are presented.

In an international online survey of déjà vu, Fortier and Moulin (2015) found that 84% of their 593 respondents had experienced déjà vu at least once in their life. Only 34% had experienced it in the last month. Moulin et al. (2014) found that people aged 18–24 on average experienced déjà vu only six to eight times a year.

Contemporary definitions of the experience converge on it being a “clash” or “conflict” between evaluations: “*déjà vu* is the subjective experience of familiarity combined with the knowledge that this experience is false” (Moulin 2018; p. 1). This differentiates *déjà vu* from other false memory phenomena. In false memories, one accepts as true one’s feeling of having encountered something before. In the *déjà vu* experience, one has the eerie feeling that all is not as it should be. This definition also focuses on the concept of *familiarity* (for reviews see Montaldi and Kafkas 2021; Mandler 2008) and thus references memory theory, allowing the use of what is known about a better-understood theoretical entity (*familiarity*) to understand a lesser known one (*déjà vu*).

Déjà vu has experienced an upsurge of scientific interest since the publication of Alan Brown’s review (Brown 2003), and it is now considered a mainstream topic in cognitive psychology (see reviews by Aitken et al. 2023 and Barzykowski and Moulin 2023). This contemporary scientific work has necessitated revisiting existing ideas about *déjà vu*, most of which are not scientifically supported. These explanations are briefly reviewed here.

1. *Déjà vu is a visual experience.* *Déjà vu* is a French term that literally means “already seen.” Perhaps because this definition emphasizes visual experience, many people have argued that *déjà vu* has to do with one eye receiving information before another (or information from one of the two eyes being delayed at a neural level). This idea was debunked with minimal effort: blind people experience *déjà vu* (e.g., O’Connor and Moulin 2006).
2. *Déjà vu is caused by remembering dreams.* Freud proposed that *déjà vu* arises when someone reencounters something processed unconsciously, such as in their dreams. There is little to suggest that dreams are the *only* cause of *déjà vu*, though they may be a source of information that contributes to it. For example, the frequency of *déjà vu* experiences correlates with several dream variables (e.g., the ability to recall dreams vividly). Funkhouser and

Schredl (2010) found that 16–74% of 444 participants report previously dreaming of the experience for which they have *déjà vu*. While these findings may be underpinned by a simple capacity to remember mental experiences, there may nonetheless be a relationship between dreaming and *déjà vu*.

3. *Déjà vu is caused by two streams of information becoming desynchronized.* This “dual-pathway” explanation stems from an outdated, nineteenth-century understanding of the brain. It proposes that one neural signal splits and becomes desynchronized as it travels across the brain’s hemispheres. When these now separate signals are integrated into consciousness, they are experienced twice, the first as novel and the second, almost immediately after that, as familiar. This theory no longer tallies with current understanding of neural information processing. Moreover, it does not explain why *déjà vu* often feels like a repetition from an undefined or distant past (Spatt 2002).

The “dual-pathway” framework points to a dissociation between usually well-synchronized processes, an idea which is emphasized in current accounts of the experience (e.g., Aitken et al. 2023). Instead of thinking of a delay between hemispheres, current theories see *déjà vu* as a dissociation between separate recognition memory processes, yielding four broad theories: the source amnesia account; the Gestalt similarity hypothesis; the generation of metacognitive conflict; and the decoupled familiarity hypothesis.

1. **Source amnesia for familiar stimuli.** Source amnesia describes the retrieval of new information without awareness of how it was acquired. Though it can be demonstrated reliably in certain clinical populations, even healthy groups show some source amnesia.

According to the source amnesia account, *déjà vu* is produced when a person forgets the source of information, or when the source of the information was never consciously known. Inspired by this account, Brown and Marsh (2008) produced a phenomenon the likened to *déjà vu* in the laboratory. In phase 1,

participants briefly saw photos of locations on their own university campus, or on another campus (where they have never been). In phase 2, participants viewed the same pictures intermixed with new ones. This time they reported whether or not they had been to the pictured places. Brown and Marsh found exposure to a picture in phase 1 increased participants' belief that they had visited that location in phase 2. Though the authors mentioned déjà vu in their discussion, it is not clear whether their participants felt any kind of conflict, or indeed déjà vu.

Such experiments (see also Brown and Marsh 2010) suggest that déjà vu results from finding something familiar without being able to access a previous study episode. One problem with the déjà vu in these situations though is that the familiarity contributing to the experience is not false—the same stimulus *has* been encountered before. Extrapolating from these experiments would mean that, in the real world, déjà vu would be due to having already encountered a stimulus, no matter how briefly or incidentally. This would be a problem for déjà vu in completely novel scenarios. Additionally, source amnesia is anecdotally relatively common in daily life, yet déjà vu is infrequent.

2. **Gestalt similarity.** The Gestalt similarity hypothesis is broadly similar to the source amnesia account, except that the feeling is triggered by similarity—an identical stimulus repetition is not required. This account typically places an emphasis on configural similarity. *Gestalt* refers to an overarching “form” or “structure” into which perceptual elements are arranged. Like the source amnesia account though, the experient should be unaware of the source of the similarity-driven familiarity.

This account again lends itself to laboratory testing. In a study by Cleary et al. (2012), participants first encountered labeled rooms (e.g., “bedroom”) in a virtual reality environment. They were next presented with similar and dissimilar rooms, and for each room asked to i) recall the label, ii) rate the room's familiarity, and iii) indicate whether it triggers déjà

vu. Participants could recall the label of nearly half the similarly configured rooms. Importantly though, this left a set of rooms yielding undetected similarity. These undetected similar rooms were compared to rooms that were entirely novel with around 30% of similar rooms eliciting déjà vu, compared to below 20% for novel rooms.

Cleary's experiments yield experiences that participants identify as déjà vu. O'Connor and Moulin (2010) point out, however, that it needs to be explained how this experience differs from those such as the “butcher-on-the-bus” phenomenon (e.g., Mandler 2008). In the titular example of the latter, the butcher out of their usual context is impossible to identify, leading to the frustrating unresolved feeling of familiarity. If you have had this experience, you will understand its peculiar intensity, but you will also be aware that this experience is not déjà vu. In the laboratory, it is difficult to differentiate the butcher-on-the-bus phenomenon from déjà vu, but in the real world, these are unambiguously different experiences.

3. **Déjà vu as metacognitive conflict.** Placing importance on the awareness of *false* familiarity, Urquhart and O'Connor (2014) aimed to introduce a sense of certainty that an item was novel to an experimental procedure involving similarity. Their critical point was that déjà vu involves a strong feeling of conflict between two mental evaluations. They used a procedure extended from Deese (1959) by Roediger and McDermott (1995) known as the DRM paradigm. In the DRM, participants study words in lists that converge on a critical nonpresented lure word, e.g., “blanket,” “awake,” “snooze,” “nap,” “dream,” and “bed,” which converge on the related but nonpresented “sleep.” With the lure being so highly similar to the key concepts in the study list, it is very likely to be falsely recognized. Nonetheless, the DRM does not give people déjà vu because they are not aware that the lure is novel.

To introduce certainty that the lure was novel, Urquhart and O'Connor tasked participants with monitoring the studied lists for specific letter strings, e.g., “SL” in the above list.

After study, participants reported the number of times they saw the string. When participants reported that no studied words contained the string, and were reminded of this as they experienced DRM-induced familiarity for the string-containing lure, Urquhart and O'Connor predicted that this conflict would lead to déjà vu. Déjà vu was reported at least once by 60% of their participants. These results, which have been extended in an fMRI task (Urquhart et al. 2021), suggest that familiarity alone is not enough to generate déjà vu. Nonetheless, there is more work needed to improve the ecological validity of the task given that naturalistic déjà vu does not appear to occur for isolated words.

4. **Decoupled familiarity.** The final class of theory draws on the experience of déjà vu in neuropsychological populations. It posits that déjà vu arises when familiarity spontaneously arises, independent of stimulus-driven memory processing. This is a neurological proposal, based on there being a separable neural process responsible for familiarity, which can, under certain circumstances, be triggered erroneously. Despite the feeling of familiarity, other memory or metacognitive processes correct the overall evaluation, generating a déjà vu.

The genesis of the decoupled familiarity hypothesis was the observation that people with temporal lobe epilepsy (TLE) frequently experience déjà vu during specific neurological events—pre-seizure aura—when a particular region of the temporal lobe predictably becomes active (Spatt 2002). This would suggest that déjà vu in healthy people also arises when this locus of familiarity becomes erroneously activated. Moulin (2018) has advanced this neuropsychological account, proposing that in déjà vu, this temporal lobe activation is likely to co-occur with a pattern of frontal activation indicating the detection of false familiarity, and the resolution of this memory conflict.

Decoupled familiarity hinges on whether it is reasonable to compare the experiences of people with epilepsy with those of healthy people. In comparing descriptions of déjà vu

in 15 TLE patients and 115 university students, Fukao et al. (2005) found some support for this. Although déjà vu in students was more likely to occur for unfamiliar locations and people, cause surprise, and happen during mental fatigue, common characteristics across samples included its duration (in the order of seconds) and association with nostalgia. Warren-Gash and Zeman (2014) also tested differences in déjà vu experienced by 50 epileptic patients, 50 nonepileptic neurological controls, and 50 medical students. They found very few differences between control and epileptic déjà vu experiences, and concluded that healthy and epileptic déjà vu was qualitatively very similar.

Regardless of the neuropsychological evidence base, a major limitation is that, for people without neurological condition requiring brain surgery, this proposal remains entirely theoretical. Without stimulating the brain directly with an electrical current (see Curot et al. 2017), this seems a difficult hypothesis to test.

The emphasis on a conflict, or the “metacognitive” resolution of a false feeling in the phenomenon has led to interest in whether déjà vu may actually signal healthy high-level cognitive functioning, rather than it being thought of as a memory “failure.” In support, younger people have déjà vu more than older people (Moulin et al. 2014). If this is considered alongside the idea that healthy older adults experience memory difficulties (e.g., Balota et al. 2000), it seems odd that older adults have *fewer* experiences of déjà vu. One explanation is that older adults have reduced metacognition—the awareness of one’s thought processes and a particular ability to reflect upon the memory system. Detecting memory conflict and therefore experiencing déjà vu might be viewed as a sign that metacognition is healthy and all is well in the cognitive system.

Experimental work comparing people who do and do not experience déjà vu leads to a similar conclusion. Martin et al. (2012) compared seven patients who consistently reported déjà vu as part of their seizures, six patients with epilepsy who

had never experienced déjà vu, and 26 healthy controls. They found that both TLE groups showed deficits in general recognition memory relative to the control group—an expected finding as epilepsy affects memory function. Importantly though, the TLE group who experienced déjà vu had superior performance in their ability to retrieve specific details relative to the group of TLE patients who did not experience déjà vu. Brain scans showed that the déjà vu-experiencing patients had more intact medial temporal lobes. As such, déjà vu is not pathological. This is not to say that frequent bouts of déjà vu are a healthy sign (quite the opposite), and it remains true that there are people for whom déjà vu is distressing and debilitating.

Much of the upsurge in interest in déjà vu stems from the fact that laboratory analogues now exist of the phenomenon, and this opens up the possibility of integrating déjà vu into more mainstream theories of more mundane aspects of memory retrieval. There are some concerns with this approach though. Is laboratory-produced déjà vu really like that experienced in the real world? And can researchers rely on subjective participant reports of déjà vu in laboratory situations?

Some researchers have attempted to compare lab-based and naturalistic déjà vu experiences. Sugimori and Kusumi (2014) used Cleary's procedure to measure their participants' detection of similarity, and also surveyed previous experiences of déjà vu. They found a strong correlation between the frequency of déjà vu experiences in daily life and the familiarity ratings for novel but similar scenes in the laboratory. Urquhart and O'Connor asked their participants to provide a short description of a naturalistic déjà vu experience and instructed their participants to compare it to their laboratory-based déjà vu experiences. Some who reported the experience during the experimental procedure became more cautious about calling it déjà vu when asked to compare it to their naturalistic experiences, and even reported the expectation that reporting déjà vu might be the "correct" response.

The idea of "correctly" reporting déjà vu raises the critical issue of demand characteristics in déjà vu experiments. Orne (1962) described demand

characteristics as cues in psychology experiments that convey the experimental hypothesis to the participant without the experimenter intending them to, with the result that participants adapt their responses to the expectations of the experimenter (Norenzayan and Schwarz 1999). Jersakova, Moulin, and O'Connor (2016) considered the possibility that déjà vu reports in lab-based experiments are influenced by demand characteristics. They used a standard memory task during which participants were asked repeatedly if they had experienced déjà vu. Under these conditions, their participants reported on average four to six experiences of déjà vu to a task that had no theoretical basis for its generation. The problem here is that there is no objective proof that someone is experiencing déjà vu, so researchers are reliant on self-report. A priority for future research might therefore be to identify an observable marker of déjà vu. One exciting possibility is to find its neural "signature." If the experimental approaches discussed so far converge on the same cognitive processes, it would be expected that they all yield similar patterns of activation.

In sum, this account of déjà vu has situated it in contemporary cognitive theory. In exploring theories of déjà vu formation from cognitive psychological and neuropsychological perspectives, a framework has been provided within which it can be tested further. The assumption that déjà vu is pathological has also been analyzed, concluding that it is more than likely precisely the opposite—an indicator of healthy metacognitive function. Finally, the issues that affect the experimental work presented here have been critically examined. In particular, demand characteristics should be accounted for and researchers should be wary of how they affect findings in research on subjective experience with no observable markers.

Cross-References

- [Involuntary Autobiographical Memory](#)
- [Mental Time Travel](#)
- [Time](#)

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