PERGAMON

Neuropsychologia 41 (2003) 538–549

NEUROPSYCHOLOGIA

www.elsevier.com/locate/neuropsychologia

Inappropriate association of semantics and context to novel stimuli can give rise to the false recognition of unfamiliar people

Jamie Ward [a,*], Luke Jones [b]

[a] *Department of Psychology, University College London, Gower Street, London, WC1E 6BT, UK*
[b] *Experimental Psychology, University of Sussex, Brighton, UK*

Received 5 March 2002; received in revised form 15 August 2002; accepted 2 September 2002

Abstract

This paper reports further experiments with a patient (MR) who has a tendency to claim that unfamous people are familiar together with good ability at identifying truly famous people. The first experiment examines the role that the typicality of stimuli plays in his false recognition. Although, typicality may have some influence over false recognition (as it does for normal controls) there is little evidence to suggest that MR is over-reliant on such information. It is unlikely that perceptual fluency can entirely explain his deficit. This is bolstered by a further study using morphed images of famous and unfamous faces, suggesting that false recognition is associated with inappropriate retrieval of semantic-biographical information. It is argued that MR's judgement of 'fame' is subjectively appropriate, given the information that he retrieves. This information is thought to derive from currently activated, or recently activated, contextual information which becomes inappropriately bound to the novel stimulus, giving rise to a false sense of familiarity. These findings underscore the importance of viewing memory as an attributional process, whereby current mental constructions/processes are attributed to some event(s) in the past.

Keywords: False memory; Recognition; Faces; Familiarity; Context; Frontal lobe

1. Introduction

In everyday situations, people might mistakenly feel that an unfamiliar person is known to them without being able to specify exactly who that person is [54]. In recent years, a neuropsychological disorder has been identified in which the rate of such errors may reach pathological proportions. These patients produce a very high rate of false recognition errors to *unknown* people even though their ability to recognise *known* people is apparently good [31,33,34,48,53].[1] For example, patient (MR) correctly classified 98 and 100% of famous faces and famous names as famous, but he incorrectly classified 77 and 63% of unfamous faces and unfamous names as famous [48]. MR describes his own disorder, which he is aware of, as "like seeing film stars everywhere". In this paper, we describe further studies with MR that investigate the origin of this phenomenon.

At what stage in the recognition process might such a disorder arise? One clue comes from the lesion site of the patients who have been reported. These patients typically have lesions to the frontal lobes [31,33,34,53], which suggests that the disorder might be associated with some aspect of task planning and decision making. This would also be consistent with the fact that the recognition of familiar stimuli appears to be largely uncompromised in these patients. However, there is some disagreement in the literature as to how the defective mechanism in these patients should best be characterised. Rapcsak et al. [31,33,34] have suggested that the patients rely on an undifferentiated feeling of familiarity and do not spontaneously engage in strategic retrieval of other potentially relevant sources of information (e.g. semantics, context). This feeling of familiarity is assumed to arise through incidental perceptual similarities between the unfamiliar stimulus and familiar stimuli stored in memory. Ward et al. [48] put forward a different interpretation. They suggested that these patients do spontaneously

* Corresponding author. Tel.: +44-20-7679-5394; fax: +44-20-7436-4276.
E-mail address: jamie.ward@ucl.ac.uk (J. Ward).

[1] Rapcsak et al. [32] document two patients, WJ and BH, who appear to present with a mixture of deficits. Unlike the other patients, they also have some difficulty in recognising famous faces which may reflect a perceptual/attentional disturbance (both patients have neglect and some signs simultanagnosia). In addition, they also produce a high rate of false recognition together with overt misidentifications which Rapcsak et al. [32] attribute to a deficit in search and decision making procedures.

0028-3932/02/$ – see front matter
PII: S0028-3932(02)00172-0

retrieve semantic and contextual information, but that the information that they retrieve is false (or confabulatory).[2] This, in and of itself, leads to them being incorrectly classified as famous. The evidence for and against these different interpretations is discussed below, and further empirical evidence will be presented here to disentangle them.

Evidence for Rapcsak's hypothesis that false recognition of people arises from familiarity stems, at least in part, from the patients' performance on tasks of episodic old/new recognition memory. His patients also produced high levels of false alarms together with normal hit rates in these tasks [34], as does our patient [47]. Previous research on this phenomenon has suggested that it arises because patients encode or retrieve the shared (or gist) properties of items rather than the distinctive properties [29,36]. Distracters will also tend to have many of these properties and so will be falsely accepted. However, it remains questionable whether this apparent association of deficits (i.e. performance on fame judgements and recognition memory) necessarily implies a common defective mechanism [48]. Parkin et al. [30] document a patient who shows false recognition on tasks of episodic memory but not in recognition of people, whereas, Young et al. [53] reported the opposite dissociation. This suggests that the two deficits do not necessarily co-occur. Moreover, there appear to be important differences between performance on these tasks that cannot easily be explained by a single deficit. For instance, MR's deficit in episodic memory appears not to be material specific (it is found for words, faces, non-words, etc.), whereas, his tendency to say that unfamiliar people are famous is material specific (it is not found for made-up vocabulary and place names, for instance).

One further line of evidence that provides support for Rapcsak's account, is that when patients are asked to respond "yes" according to whether they think that a face is famous they produce a high level of false recognition, but when asked to respond "yes" only if they can remember their name the false recognition resolves [34]. This was taken as support for the hypothesis that the patients rely on familiarity and do not initiate memory searches for other types of information (e.g. names) unless cued to do so.

However, there is some evidence which directly contradicts this account. Firstly, the patients appear to retrieve semantic information when they falsely recognise, both spontaneously and when prompted. Thus, MR describes Michel Rapineaux (unfamous name) as "A French singer who is half black and has braided hair. He had a hit a couple of years ago, but I can't remember what" [48]. Case descriptions of other patients suggest that they do likewise [31,53]. This is problematic for the suggestion that false recognition arises from reliance on perceptually based familiarity resulting from a failure to search semantic memory. It implies that semantic information is indeed available, and it raises the possibility that the presence of this incorrect information which both drives and maintains the false recognition [48]. One thing that should be noted is that the false information that is supplied does not normally constitute on overt misidentification. For instance, in the example presented above MR does not produce enough semantic information to suggest that he is mistaking Michel Rapineaux for a known unique individual. Similarly, when asked to produce as much information as he can when given an unfamous face MR does not produce names [48]. Thus, the explanation of Ward et al. [48] that false recognition arises from inappropriate semantic retrieval can account for the observation of Rapcsak et al. [34] that false recognition can be avoided by focusing on names, if the inappropriate semantic information is of a generic rather than identity-specific nature.

The explanation put forward by Ward et al. [48] clearly needs to be unpacked further if it is to have any real utility. Perhaps the most significant outstanding question is: where does the false semantic information come from? The current investigation will address this. There are a couple of possible options. Firstly, the false semantic information may be related to the semantic properties of known individuals who bear a similar physical resemblance. One line of evidence against this explanation is that patients often show false recognition in different modalities (faces, names, voices) [31,32,48]. This explanation is also quite difficult to disprove because there is no a priori way of knowing who the similar looking people are. Nonetheless, we attempt to explore this below using morphed images of unfamous and famous faces.

A second explanation is that the false semantic information derives from currently active contextual information which is unrelated to the stimulus presented but nevertheless becomes inappropriately bound to it. For instance, Rapcsak et al. [31] report the following anecdote: "following a casual conversation about horse racing in England, he (JS) misidentified unfamiliar faces as BBC sports announcers, famous English jockeys, and horse trainers." (p. 1260). Further evidence that false recognition is tied to the contextual setting (which varies) rather than relating to the perceptual properties of stimuli (which are invariant), comes from experiments which have varied the task instructions whilst keeping the stimuli constant. In the same study, Rapcsak et al. [31] gave JS the same yearbook photo of unfamiliar faces on two occasions. When told that the photo was taken in his high school he said that 40% of the faces were familiar, but when told that it was taken at another high school that he had not heard of he recognised only 2.5% of faces. In a similar vein, Ward et al. [48] presented their patient with the same set of familiar (e.g. Oliver Twist) and unfamiliar (e.g. Agnes Blythe) names on a number of occasions. When asked to identify famous *people* from literature he produced high levels of false recognition but not when asked to recognise *book* titles. Thus, the apparent presence or absence of a deficit seems to be directly related to the task demands. This, again, is

[2] Note, however, that this symptom is not necessarily part of a more widespread confabulatory disorder because it is not necessarily evoked by other types of stimuli, and nor does the patient produce confabulations in autobiographical memory retrieval.