

## *SPECIAL ISSUE*

# TWO FURTHER INVESTIGATIONS OF AUTOBIOGRAPHICAL MEMORY IN SEMANTIC DEMENTIA

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### ABSTRACT

A number of investigations in semantic dementia have documented better retrieval of recent personal events compared to those in the more distant past (Graham and Hodges, 1997). Westmacott et al. (2001) challenged this result, however, finding relative preservation of remote memories in a single case of semantic dementia when he was tested using family photographs. In Experiment 1, we tested two possible explanations for the discrepancy between the published papers: (a) that there is a significant effect of modality in autobiographical retrieval in semantic dementia (e.g., patients will show better, or even preserved, remote memory when tested on nonverbal, compared to verbal, tasks); and (b) that the distinct pattern seen between patients is attributable to the different methods adopted for scoring the episodic quality of the memories. A patient with semantic dementia, AM, produced autobiographical memories to both words and family photographs. These personal events were scored by two raters using the scoring method described by Westmacott et al. (2001) and that reported by Graham and Hodges (1997). It was found that AM showed similar levels of remote memory impairment regardless of whether the cue was verbal or nonverbal. In addition, significant effects of time were revealed in AM's performance on the verbal memory test, regardless of which method was used to score the memories. In Experiment 2, we investigated a related question: whether the relatively better retrieval of memories in semantic dementia could be due to over rehearsal of highly salient recent experiences? Four patients were tested on their ability to remember a recent event (either a trip to London or events from a Formula One Grand Prix race) using specially designed autobiographical questionnaires. It was found that all four were able to perform this task, although one patient showed evidence of some forgetting over three months, and another exhibited difficulty discriminating between two similar events. Together, the two experiments further confirm that patients with semantic dementia show a modality independent autobiographical memory deficit, with better retrieval of recent events.

Keywords: episodic memory, retrograde amnesia, semantic memory, temporal gradients, modality-specific effects

### INTRODUCTION

Semantic dementia, also termed the temporal variant of frontotemporal dementia, is a neurodegenerative condition affecting predominantly the anterolateral region of the temporal lobe, with relatively less atrophy to medial temporal lobe structures (Chan et al., 2001; Galton et al., 2001). The predominant cognitive feature in semantic dementia is a progressive deterioration of conceptual knowledge about people, objects, facts and the meaning of words

(Graham et al., 1999a; Hodges et al., 1992; Patterson and Hodges, 2000; Snowden et al., 1996a, 1996b). Typically, performance is poor on neuropsychological tests dependent upon semantic memory, such as picture naming, category fluency (i.e., generating as many exemplars from a semantic category as possible in a minute), word-picture matching, defining concepts in response to their names or pictures and sorting pictures or words according to pre-specified criteria (e.g., electrical versus non-electrical). Studies have also revealed that the deficit is not specific to tests requiring production or comprehension of language – patients are unable to select the correct colour for a black-and-white line drawing (e.g., yellow for a banana), draw animals or objects from memory, and point to the correct picture after hearing a sound (Bozeat et al., 2000, in press). By contrast, patients show little impairment, even at relatively late stages of the disease, on tests of phonological and syntactic processing, visuospatial ability and working memory (Hodges et al., 1995; Snowden et al., 1996b).

Turning to episodic memory, a number of studies have demonstrated preservation of day-to-day memory in semantic dementia, with significantly better retrieval of recent compared to remote personal events. For example, Snowden et al. (1996a), Graham and Hodges (1997) and Nestor et al. (2002) reported that patients with semantic dementia showed better recall of recent memories compared to those from childhood and early adulthood on the Autobiographical Memory Interview (Kopelman et al., 1990). In a single case-study, described by Graham and Hodges, a patient AM, showed clear evidence of a 'step-like' pattern of performance, with good recall of memories from only the last five years of his life, when asked to retrieve memories from cue words (see also JH reported in Nestor et al., 2002).

A more recent article, however, failed to find this profile in a single case of semantic dementia, EL (Westmacott et al., 2001). Westmacott and colleagues presented EL with 50 photographs evenly distributed across his lifetime, and asked him to produce detailed descriptions about the events portrayed in the photographs. He performed close to ceiling on this task and there was no evidence of an influence of event age. By contrast, EL did show an effect of time when he was asked to name the people shown in the photographs, with better naming in the recent photographs compared to people depicted in photographs documenting more remote events. This finding in the remote semantic component of the photographs test is consistent with other experiments in semantic dementia, in which effects of time (recent > remote) have been demonstrated on tests such as knowledge of famous people and public events (Graham et al., 1998; Hodges and Graham, 1998; Westmacott and Moscovitch, 2002).

Although the finding of good autobiographical memory in EL has to be interpreted with caution as his performance was not contrasted with that of matched control subjects, Westmacott et al.'s (2001) result raises the possibility that the poor remote autobiographical memory documented in other studies may be attributable to the 'verbal' nature of the memory tasks typically adopted in these experiments. This issue – whether patients do show consistent effects of time on both verbal and non-verbal tasks – is of significant theoretical interest.

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