Episodic versus semantic memory impairments and deficits in discourse production

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Introduction

Autobiographical memory is composed of semantic memory (general knowledge) and episodic memory (memory of specific events) (1). Semantic variant primary progressive aphasia (svPPA) is a disorder which affects the semantic memory system and whose most prominent symptom is aphasia (2). Mild cognitive impairment (MCI) is a condition in which there is greater than expected cognitive decline in comparison to healthy-aging, with high rates of progression to Alzheimer's disease (AD) (3). Amnestic mild cognitive impairment (aMCI) defines MCI patients whose cognitive decline affects episodic memory specifically.

These two neurodegenerative conditions have different patterns of memory deficits, however the linguistic deficits generally observed are not completely contrasting:

Group	Memory characteristics	Linguistic characteristics
svPPA	semantic memory impaired, episodic memory spared (4)	Fluent speech, spared syntax, deficits in naming, verbal fluency, single word comprehension (2)
aMCI	episodic memory impaired, semantic memory spared (5)	Fluent speech, spared syntax, deficits in naming and verbal fluency, alterations in receptive language processing (6)

Objectives

- To compare discourse and memory patterns in these two groups of patients with healthy matched controls.
- To test whether patients' coherence of discourse would be impaired.

Hypotheses

- We hypothesised that both groups would show deficits in coherence of discourse; and given their memory deficits, coherence would be more reduced in svPPA patients when producing semantic details, while aMCI patients would be more impaired when producing episodic details.

Methods

Participants	Task	Coding
18 svPPA patients and 18 healthy matched controls 14 aMCI patients and 16 healthy matched controls	The svPPA group reported 2 memories of personal past events, the aMCI group reported 5 memories. The answers generated extended stretches of discourse.	1- Answers were transcribed and segmented into utterances (details); 2-The content of the details was analysed using a coherence rating scale; 3- The details were categorized as episodic or semantic and the coherence score was calculated for each composite

Coherence scores	"Who was the best man at your wedding?"
3 detail is an element of the semantic frame	"um the best man would have been a friend of mine"
2 detail is a relevant implication of the frame	"who I went to university with back in 1958 to 1964" "um who now lives in Vancouver"
1 detail is neither an element of the frame nor relevant to the topic	"actually lives up not in Vancouver but in… " "um where's where's the Olympics going to be this Winter?" "um that's where he lives"
0 detail is devoid of semantic content	"you know?", "yeah"

References

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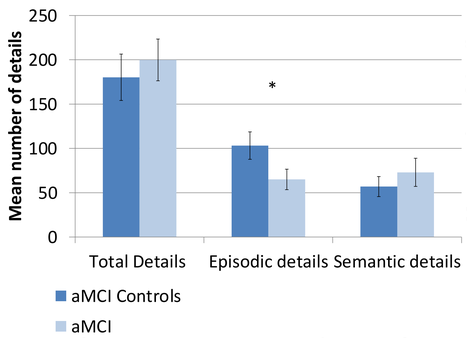
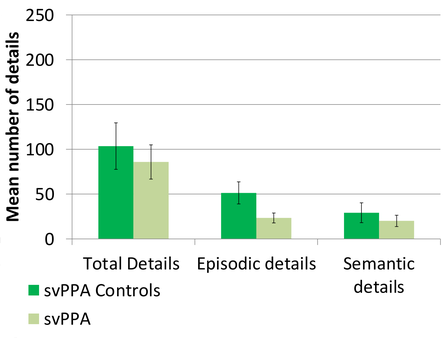
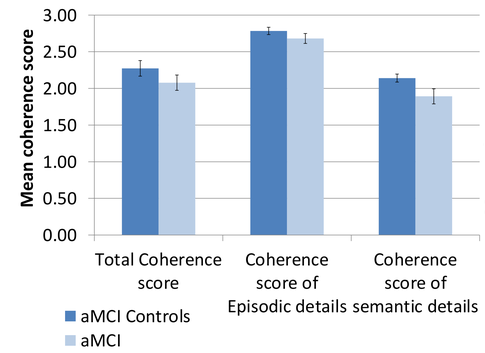
Number of details produced by aMCI patients and controls



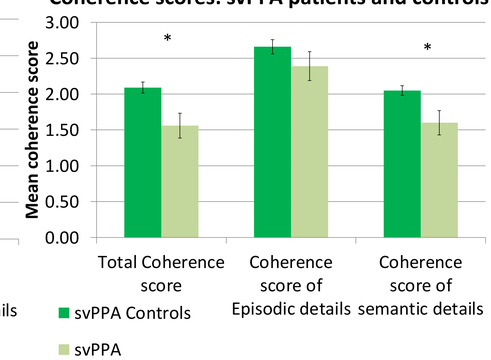
Number of details produced by svPPA patients and controls



Coherence scores: aMCI patients and controls



Coherence scores: svPPA patients and controls



Results and Discussion

- The aMCI and svPPA groups produced fewer episodic details than controls (aMCI: p=.01, d=.99; svPPA: marginally significant results at p=.06, d=1.11). The patient groups produced a comparable number of total and semantic details in relation to controls;
- The aMCI group showed a tendency for lower scores in total coherence when compared to controls (p=.08, d=.65). Contrary to our predictions, when semantic and episodic coherence were compared, the aMCI group showed a tendency towards a lower score in the semantic details composite (p=.07, d=1.11), but not in the episodic;
- As predicted, the svPPA group demonstrated deficits in total coherence (p<.01, d=1.49) and the semantic composite showed coherence scores significantly lower than controls (p=.03, d=1.31);
- These results suggest that: a) in spite of the cognitive differences usually attributed to svPPA and aMCI, these groups show similar patterns of autobiographical memory recall and discourse coherence; b) there may be a relationship between reduced number of episodic details and lower coherence of semantic details during autobiographical recall, as both groups presented the same pattern in spite of their differences in cognitive decline.