To explore item STM and order STM capacities in two brain injured patients presenting initially with aphasia.

Patient CG: Increased auditory presentation of digit lists of increasing length (3 to 7 words).

Patient CG: Impaired immediate serial recall.

Patient CG: Slowed order recognition.

Materials:

Experiment 1: Item and order probe recognition
- Immediate repetition of word lists of increasing length (2 to 7 words).
- The proportion of item and order errors was determined.

Experiment 2: Item and order errors in immediate serial recall
- Immediate repetition of digit lists of increasing length (3-8).
- After presentation, cards with the digits printed on them are handed out and have to be arranged as a function of the digits’ order of presentation.

Experiment 3: Serial order reconstruction
- Auditory presentation of digit lists of increasing length (3-8).
- After presentation, cards with the digits printed on them are handed out and have to be arranged as a function of the digits’ order of presentation.

Experiment 4: Verbal learning
- Paired associate word nonword learning task.
- 4 bisyllabic nonwords to be learned.
- 5 learning trials.

Results:

Experiment 1: Item and order probe recognition
- Patient MB: Impaired item recognition
- Patient CG: Slowed order recognition.

Experiment 2: Item and order errors in immediate serial recall
- Patient MB: Increased rate of item errors; preserved order recall.
- Patient CG: Increased rate of order errors; preserved item recall.

Experiment 3: Serial order reconstruction
- Patient MB: Preserved order recall.
- Patient CG: Impaired.

Experiment 4: New verbal sequence learning
- Patient MB: Impaired.
- Patient CG: Impaired.

Method & Results

Participants:
- Patient MB suffered from a CVA. He showed mild receptive phonological impairment and reduced word and digit spans.
- Patient CG suffered from TBI. He was initially anomic; at the time of this study, he showed reduced word and digit spans but no residual language impairment.
- Control group: healthy adults matched for age and profession (N=10 for each of the two groups).

Discussion

- This case study demonstrates the first double dissociation between item and order retention capacities in STM.
- In MB, a specific item STM impairment is associated with residual language impairment. This is in line with current STM models that treat language processing as a major determining factor of item STM performance (e.g., N. Martin & Saffran, 1992; Majerus & D’Argembeau, 2011).
- CG shows selective impairment of STM for order, associated with new word learning difficulties, as supported by recent models considering that order STM capacity is a fundamental building block of new word learning (Gupta, 2003; Majerus & D’Argembeau, 2011).

- Selective verbal STM deficits reflect distinct types of impairment.

References


