Autobiographical memory, future thinking and self-identity in Parkinson’s Disease

Abstract
Autobiographical memories (AMs) are important in maintaining a sense of self. People with Parkinson’s Disease (PD) lack detail when recalling AMs, though there is no research looking at self identity in PD. In addition, future thinking is impaired in PD though the idea of exploring a ‘future self’ is novel to this group. These relationships are explored following a between subjects design. Fifteen individuals with PD and 15 controls carried out ‘I am’ and ‘I will be’ tasks which cued recall of AMs and production of imagined future events. T-tests and ANCOVAs found that PD participants’ memories and future images were significantly less episodic than controls’ and these clustered around times of self-emergence in both groups. In addition, PD participants produced fewer ‘I am’ statements in timed and untimed conditions. Results support findings of less episodic, overgeneral AM in PD which may explain reduced access to self knowledge and weaker sense of self in PD. Results also provide evidence for the preserved organisational properties of current and future self concepts in accessing memories and generating imagined future events in PD.

Introduction

- AM involves episodic (specific, detailed event) and semantic (general, factual) memory (Tulving, 1985)
- Self memory system (SMS; Conway & Pleydell-Pearce, 2000) says a bidirectional relationship exists between self and memory: o AM helps to form a sense of self and guides behaviour o Self identity influences selection and recall of AMs
- AM is overgeneral and less episodic in Parkinson’s Disease (PD; Smith, Souchay & Conway, 2010), but no self research exists.
- Less episodic future thinking in PD (De Vito et al., 2012), thus future self may be impaired – no existing research.

Hypotheses
AM and future thinking will be impaired in PD, as will current and future self-identity.

Method

Participants
Table 1. Demographic data of the 2 groups.

<table>
<thead>
<tr>
<th>Demographic characteristic</th>
<th>PD (n=15)</th>
<th>Control (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (SD)</td>
<td>72.4 (8.46)</td>
<td>71.5 (6.42)</td>
</tr>
<tr>
<td>Male:Female</td>
<td>10:5</td>
<td>7:5</td>
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Materials
- Screening tests: Unified Parkinson’s Disease Rating Scale, Geriatric Depression Scale, Mini Mental State Examination, National Adult Reading Test, Verbal fluency – FAS and animals
- ‘I am’ and autobiographical memory task: o Describe yourself in ‘I am’ statements in 1 minute o After 1 minute, keep going to try to reach 20 statements o Pick the 3 most defining statements and date their emergence o Recall specific memories relating to each of the self identities

Results

Figure 1. Group differences in mean episodic scores for AMs and future images.

One way ANCOVA, with letter fluency and NART scores as covariates, confirmed less episodic AMs and future images in PD.

Table 2. Group differences in number of self statements generated in the 2 conditions in the ‘I am’ (current self) and ‘I will be’ (future self) tasks (means and standard deviations).

<table>
<thead>
<tr>
<th>Group</th>
<th>‘I am’ task</th>
<th>Overall</th>
<th>‘I will be’ task</th>
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<tbody>
<tr>
<td></td>
<td>60 second</td>
<td>Overall</td>
<td>60 second</td>
</tr>
<tr>
<td>PD</td>
<td>7.57 (1.74)</td>
<td>15.73 (5.18)</td>
<td>3.8 (3.21)</td>
</tr>
<tr>
<td>Control</td>
<td>13.33 (3.33)</td>
<td>18.93 (1.75)</td>
<td>5.29 (2.16)</td>
</tr>
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Accessibility of self identity
- Assessed by number of self statements generated in 1 minute
- One way ANCOVA, to control for verbal fluency and NART, found PD participants produced significantly fewer ‘I am’ statements in 1 minute, suggesting self knowledge is less accessible
- No group differences in accessibility of future self concepts from the ‘I will be’ task

Strength of self identity
- Assessed by number of self statements produced overall (not timed)
- Independent samples T Test found PD participants generated significantly fewer ‘I am’ statements overall, suggesting weaker overall sense of self exists in PD
- No group differences in future-self strength from ‘I will be’ task

Discussion

- People with PD experience difficulties remembering episodic AMs and imagining episodic future events; these are more semantic
- Current self concepts are generally weaker and less accessible in PD, which in the context of the SMS, may be due to impaired AM
- Self appears to have a similarly powerful organisational influence on retrieval of AMs and production of imagined future events in both PD patients and healthy controls
- Future thinking deficits occur with a sparing of future self deficits suggesting importance of other factors, e.g. executive function

Implications

- Impaired AM and self identity can lead to low mood
- Potential therapeutic benefits:
  - AM deficits contribute to maintaining depressed mood, but when AMs are targeted in treatment mood can improve (Williams et al., 2007)
  - Working to improve self efficacy improves mood via better AM and future thinking (Brown, Dorfman, Marmor & Bryant, 2011)

Conclusions
This study demonstrates, with evidence from a PD sample, that AM impacts self and self is important for AM retrieval. Though future self may be less important for future thinking as future thinking can be impaired independent of any impairments of future self.

References