The influence of personal experience on object knowledge in Alzheimer’s Disease.

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Introduction
Dementia patients often show a precipitous decline in everyday function immediately after moving to a new residence. While the environment likely plays a role in the decline, there is evidence suggesting novel objects may also contribute to the functional deficits. For instance, individuals with semantic dementia name and use their personal objects more accurately than alternate exemplars of the same objects (Snowdon et al., 1994; Bozeat et al., 2002). Furthermore, studies of repetition priming show healthy subjects are faster at naming familiar versus novel objects.

The mechanism(s) mediating the personal familiarity advantage is/are not well understood. In studies of semantic dementia the effect has been attributed to relatively preserved episodic memory (Snowdon et al., 1994), script knowledge (Funnell, 2001), and automatic stereotyped responses (Bozeat et al., 2002).

Aims
Is the personal object advantage observed in Alzheimer’s disease, a condition associated with episodic memory impairment?

If so, what is the mechanism for this advantage? That is, does the advantage occur on tasks requiring demonstration of script knowledge or automatic, stereotyped responses?

Participants
11 mild to moderate dementia patients were recruited from an outpatient memory clinic. All participants met criteria for AD (McKahn et al., 1984). 3 also showed mild white matter changes on MRI and were diagnosed with Mixed Dementia (Langha et al., 2004). Consistent with the diagnosis of AD, all participants demonstrated encoding deficits on tests of episodic memory (see Table 1).

Table 1. Demographic Characterization of the Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>79.9</td>
<td>4.9</td>
<td>79.5</td>
<td>4.1</td>
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<tr>
<td>Education</td>
<td>11.6</td>
<td>2.6</td>
<td>11.1</td>
<td>4.1</td>
</tr>
<tr>
<td>MMSE</td>
<td>20.5</td>
<td>4.1</td>
<td>20.6</td>
<td>12.0</td>
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<tr>
<td>PVT &amp; Discriminability Index</td>
<td>66.1</td>
<td>10.1</td>
<td>67.5</td>
<td>11.4</td>
</tr>
</tbody>
</table>

Procedures
Participants brought 12 - 15 personal objects to the testing session. (All objects were used on a weekly basis.) Personal objects were matched with a laboratory object (see Figure 1). The following tasks were performed with all objects:

Identification - participants were asked, “Is it yours?”

Script Generation - participants were asked 1) where, 2) when, and 3) how they would use each object. The total words produced as well as the number of correct, content words (i.e., nouns, verbs & adjectives) were tallied.

Naming - % correct and RT

Gesture to sight - % correct gesture components

Figure 1. Sample Stimuli

Results
Only 63% of participants (N = 7) were more accurate than chance at discriminating their personal objects from laboratory objects. Nevertheless, all participants generated more content words for personal vs. laboratory objects on the script generation task (see Tables 2 & 3). No other differences were significant.

Table 2. Script, Naming and Gesture Results

<table>
<thead>
<tr>
<th>Task</th>
<th>Laboratory Object</th>
<th>Personal Object</th>
<th>Analyses</th>
<th>t</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Words</td>
<td>36.7</td>
<td>17.7</td>
<td>36.5</td>
<td>14.0</td>
<td>0.13 NS</td>
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<td>Naming</td>
<td>17.7</td>
<td>14.0</td>
<td>11.4</td>
<td>14.0</td>
<td>0.16 NS</td>
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<tr>
<td>Gesture</td>
<td>2.75</td>
<td>1.55</td>
<td>1.39</td>
<td>11.4</td>
<td>0.194 NS*</td>
</tr>
</tbody>
</table>

Conclusions
An advantage for script knowledge of personal objects was observed in this group of AD/Mixed participants. The effect occurred even among those who could not discriminate personal from laboratory objects.

It is unlikely that the personal object advantage was mediated by episodic memory systems as all participants were amnestic.

The pattern of performance across tasks suggests personal objects did more than simply elicit automatic responses; they activated richer and more specific event knowledge/semantic associations than laboratory objects (Funnell, 2001).

The personal object advantage may have implications for everyday functioning in dementia. That is, whenever possible patients should be encouraged to work with old, familiar objects or should undergo repeated exposure or training with new objects.

References


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