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 novel 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 (McKahnn et al., 1984); 3 also showed mild white matter changes on MRI and were diagnosed with Mixed Dementia (Langa 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

	Age	Education	MMSE	PrVLT Discriminability Index
M	79.9	11.6	20.5	66.1
SD	4.9	2.6	4.1	12.0

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 this 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

	Laboratory Object		Personal Object		Analyses	
	M	SD	M	SD	t	p value
Script Generation						
Content Words	**8.10**	**3.0**	**9.40**	**3.2**	**2.84**	**0.018**
Total Words	36.7	17.7	36.5	14.0	0.13	NS
Naming						
% Correct	78.8	14.2	79.2	11.4	0.16	NS
RT	2.88	1.62	2.75	1.55	0.45	NS
Gesture						
% Correct	72.4	10.1	75.5	11.4	1.39	NS*

Note: NS indicates p > .66, NS* indicates p = .194

Table 3. Example Responses from Script Task

Item	Where?	What Task?	How?	Total Words	Content Words
Ice-cream Scoop					
Laboratory	I would use it in the kitchen	to eat it	scoop it out of the ice-cream box and eat some ice cream	22	4
Personal	If I wanted some ice-cream out of the refridgerator	for dipping the ice cream out of the container	opening up the ice-cream box, I'd scoop ice-cream out into a small bowl and put the lid on	35	11
Remote control					
Laboratory	in my office	keeping check account straight	well, I pick it up put the power on and then perform the task that's ahead of me	25	3
Personal	If I was sick, viewing television	turning television on off, changing stations	first off, hit the button and hit the channel if watching television, if it channel 12, I'd hit 12	29	13

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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