

Understanding specific memory disorders

Clare Morris explains the way memory is thought to work, how this information can help us in communicating, and how specific memory disorders can affect the person with dementia, in this sixth article of her series.

Clare Morris is speech and language therapist/psychotherapist with Counselling and Diagnosis in Dementia (CANDID), the National Hospital for Neurology and Neurosurgery, London

Memory and the act of "remembering" involves many different parts of the brain, but mainly the inner parts of each side (the right and the left temporal lobes). Memory problems are often the first sign of dementia, and may be the disability that the person themselves is most willing to acknowledge.

I will attempt to explain what is understood about the way memory works, and how this can give us practical help in communicating and caring for people with dementia. There is a wealth of complex and competing models of memory function; the terminology used varies, and may differ from that in current everyday and medical usage. Different aspects of memory will be defined using a cognitive neuropsychological framework, which has provided us with enormous leaps in understanding of memory in the last 50 years. What is important is to be able to recognise the different types of memory, and the way they are coded and accessed, in order to provide a framework for observation and a choice of ways to enhance quality of life for people with dementia.

Short-term memory

In neuropsychological terms *short term memory* refers to the amount of verbal material we can retain in memory in order to reproduce it exactly. Experimental evidence has shown that this is equivalent to seven digits (plus or minus two), and four or five random words or letters. This aspect of memory has been shown *not* to be essential for longer term storage of information, general problem solving ability or fluent language production, and probably has only a minor role in the understanding of speech (McCarthy & Warrington 1992).

These authors suggest, however, that we might call on our short term memory when we need to backtrack over a complex sentence in order to understand it. For example in the first sentence below, you need to hold the initial phrase in memory in order to make sense of the rest of the sentence, whereas in the second, much longer sentence, you can

understand it as it is spoken. A person with short term memory impairment would find the first sentence much more difficult to understand. We need to be aware of the way we phrase our communications in order to reduce the load on short term memory.

"Which is green, a poppy or a lettuce?"

"What is the name of the thin grey dust that remains after something has burned, such as a cigarette?"

Long-term memory

Long term memory comprises all other types of memory. There are two main components to long term memory: *episodic memory* and *semantic knowledge*.

Episodic memory

Episodic memory reflects memory for events or episodes in a person's history, and their relationship to time. These memories are unique to the individual and autobiographical in nature. This type of memory encompasses *autobiographical memory*, *implicit memory*, *explicit memory* and *procedural memory* – all discussed below.

Autobiographical memory is often impaired in people with amnesia or dementia. In the pure amnesic syndromes memory difficulties are not associated with other cognitive symptoms. Where this is very severe there is no memory for past or present events with huge implications for anticipating the future. Clive, whose story was told in a television documentary, described himself as seeing and hearing things for the first time. With awareness of memory loss, this becomes like "living in a time warp", or being "imprisoned in time" (Dalton 1992). The person with dementia may not experience such a dense amnesia, but often shows symptoms of considerable anxiety, which is linked to memory impairment, and often eased through communication strategies which acknowledge and help the person to make sense of their experience.

Explicit memory is the conscious and voluntary aspect of memory. Any episode in our personal autobiography comprises memories for the faces or physical attributes of the people, the places, the routes involved (topographical memory), the conversations, and our feelings and opinions about them. Each of these can be selectively impaired: consequently a person could be unable to remember who you are (perhaps until you speak), but be able to remember their way to the toilet, or vice versa. When testing explicit memory, the conscious recall of words and faces is required. In everyday life explicit mem-

ory is the recall of autobiographical events. Memory does not, however, always involve conscious recall.

Implicit memory represents the automatic processes that play a part in memory. There is a huge difference between automatic recall, reminiscence, and memories which just "bubble up", and conscious, active recall. People with memory difficulties may well function normally in tasks to test implicit memory; it is active conscious recall that is impaired, whether for recent or more remote events.

An example of implicit memory in action might be the way when we have a lot to think about, we find ourselves doing the "usual" activity rather than one specifically appropriate to a particular event. For example, driving along a particular route because that is the way you usually go, rather than taking a turning for a different destination because you have an appointment somewhere else. A person with dementia may be able to go and buy a newspaper, but unable to tell you or show you how to get to Tesco's. The former task is a familiar routine, rather than a need to recall a particular route.

Procedural memory is the motor component of automatic memory. It is a well learned skill such as *knowing how* to ride a bicycle, make a bed, wash up, type, play the piano, or drive a car. This is frequently preserved when memory for events is severely impaired, so long as the person doesn't stop to think or try to remember how it is done.

Semantic memory

Semantic memory represents that knowledge which is shared by a cultural group – facts about the world in general. Loss of memory for facts may manifest itself in the forgetting of word meanings, or what objects are used for. Semantic memory is selectively impaired in conditions such as *semantic dementia*, where the ability to hear and perceive words and objects is unimpaired but the person has no idea what words mean or what an object is for.

The phenomenon where people with dementia appear to remember remote events but not recent events is likely to be due to the continued rehearsal of events so that they become part of personal semantic knowledge, rather than any difference in the ability to access the memories. Research suggests that the system for recording ongoing events now, five minutes ago, two years ago, or longer, is one and the same. When asked specific questions about the remote past, people with memory impairment experience just as much difficulty. The ability to reminisce involves the repeated telling of personal

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stories, and expressing opinions about the world in general, so by-passing the need for explicit recall of episodic memory.

Modalities

Memories for events and semantic knowledge are laid down in more than one way, and all of the various types of memory reflect this in that we find people can have deficits that are limited to a particular modality – ie visual, verbal, kinaesthetic (the sensation of body position and movement) and so on. Not only do people have tendencies generally to be more verbal or more visual in their recall strategies, but there is a wealth of experimental evidence that these memories are stored separately due to selective deficits for visual and verbal material. Hence the advantage people with a "photographic memory" have in sitting examinations.

We also have memories for noises and smells, for touch and movements (kinaesthetic memory), and "gut feelings". After visiting a city, we can recall names of people, buildings, roads and landmarks; or the appearance, smells, sensations of these same experiences. Sometimes we get a strong sense of liking or disliking a place or a person but can't explain why. These modalities are clearly important to the development and access of both episodic and semantic memory, although relatively little is known about them. Just as visual and verbal modalities can be selectively impaired, it would be reasonable to suggest other modalities can too.

Bill, whose experience of amnesia is described by his wife (Dalton 1992), could remember he had been swimming by re-experiencing the movement of his arms and legs, that he had swept the garden by the feel of the broom in his hands, or that he had re-screwed the handle in the door by the sense of the pressure of his fingers on the screw-

driver and the turning of his hand.

Perhaps "gut feelings" are so central to the experience of being alive that they are the most resistant to damage. A woman who had a severe dementia took part in a group for eighteen months. While her contribution was mostly in terms of "being there", singing parts of the songs, and holding hands, once orientated to it being time for our "meeting", she was able to say that what she liked about the group was "seeing what everyone was wearing". With time and with orientation, she was able to recall an aspect of the group that was important to her, perhaps accessed via the modality "good feeling" generated by participation in the group over time.

Certainly in my work I find it helpful to assume the person with dementia is thinking and feeling and struggling for meaning with the limitations of a range of extremely disorientating disabilities. People with dementia are often assumed to have "no insight" because they are unable to explain events in the same way that others make sense them. While "insight" and awareness may well be affected, taking such a stance dehumanises the person with dementia and leaves the carer with little strategy to "make a difference".

The act of remembering

Memory involves encoding, storage, retrieval of information. However it is not a question of memory being a "box" into which information is put in, stored and retrieved, but more a dynamic system where the memory of events last weekend changes in light of the next weekend. We construct our own versions of events, and reconstruct them in light of our experience and feelings. This is true of people with memory impairment, and may help to shed light on the nature of paramnesia, or confabulation, where the person invents memories or they become muddled.

The need for a theory

If you cannot remember how your current situation came to be, or if your disability prevents you from appreciating events in the same way as others, it seems that people need to come up with a plausible explanation. Perhaps you tell yourself something so often you can even picture the event in your mind. This idea has been raised in previous articles. Peter (Morris 2000) who has a severe amnesia, but not dementia, developed intricate theories as to how his memory became affected; Raymond (Morris 2000) blamed a satanic curse for the events he could observe within his family; and Francesca (Morris 1999) talked of her return to work when her children were older. Interestingly,

despite impairment of memory for recent events, these "stories" were repeated over time, and not "forgotten".

Elizabeth has an early dementia and her symptoms fluctuate considerably. During a telephone conversation she claimed to be in hospital. When, sounding surprised, I said that I had rung her home number, she replied that the line had been transferred. Whether the mechanism of denial or memory loss is responsible (and sometimes it is impossible to separate the two) people actively construct and reconstruct events in order to make sense of events in a way they can cope best. Respect for the way the person makes sense of their situation is paramount in easing distress, by acknowledging events at the level of their own experience, and reminiscing rather than confronting the "truth". These ideas will be discussed more fully in the next and final article of this series.

Strategies for intervention

Strategies for facilitating communication with people who have memory impairment overlap with the strategies that have been discussed in previous articles relating to the experience of dementia, denial, perceptual problems and speech and language disorders (Morris 1999a, 1999b, 1999c, 2000a, 2000b).

- Respond to and acknowledge the feelings behind what is said
- Touch and non verbal communication
- Compensating for neurological deficits
- Distraction
- Compensation for deficits
- Validation Therapy
- Reality Orientation
- Reminiscence
- Listening for clues
- Beware collusion

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