Feelings of remembering and knowing: Memory and ageing from a first-person perspective

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IN THIS PAPER, we illustrate a few contemporary themes in the cognitive neuropsychology of memory as applied to healthy and memory impaired older adults. We outline some work carried out by our group in Leeds and argue that to continue to better understand and remediate memory, we must increasingly take a first-person, individualistic approach. Some of the ideas elucidated will resonate with existing clinical practice, and in other cases, the research community offers new insights. We conclude with a brief manifesto of the principles of researching subjective experience.

The state of the art: First person approaches

Four key developments in the cognitive neuropsychology of memory can help explain the shift to researching memory from a first person perspective.

Transgressing the ‘doctrine of concordance’

Memory researchers (and clinicians) use methods inherited from behaviourists. The dominant ‘measure’ is objective performance on a memory test. Early memory tests tended to use word pairs, measuring the ability to form associations*. As the field developed, researchers used lists and stories, but the emphasis remained firmly on the direct observation of tasks that were objectively verifiable. If someone remembers the word apple from a list, it is possible to check whether it was presented earlier. It is, therefore, possible to index a person’s abilities against a yardstick of their earlier – controlled – experience. Tulving (1989) described this prevailing use of objective-based measures of memory as the ‘doctrine of concordance’ whereby behaviour, cognition and experience are assumed to be one; if you measure one, you get an approximation of the others. This is very convenient for clinicians and psychometricians; it will always be more pragmatic to give someone a word list and score it out of 10, than it is to ask about subjective experiences of remembering. However, consider that a participant divulges a vivid memory of the time their mother had an ulcer on her eye and came back from the hospital with an eye patch. The conditions surrounding encoding of this event are uncontrolled, and difficult to verify, short of interviewing family members. Nonetheless, this material may be of importance to the person remembering it and could offer insights into the memory processes active whilst encoding and retrieving it. This form of autobiographical memory exemplifies contemporary ‘first-person’ memory research.

Tulving (1989) classified different memory systems on the basis of subjective experience, rather than content. He characterized episodic memory as ‘autonoetic’ (self-knowing). In contrast, semantic memory, often described as memory for facts, is ‘noetic’ (just knowing). Anoetic memory – memory without awareness – is implicit, or procedural memory. According to Tulving (1989), an episodic memory

*Note that not all early research takes this form, e.g. Ebbinghaus’s self-tests on nonsense materials, and Bartlett’s prose recall.

PSiGE Newsletter, No. 106, January 2009
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includes an awareness of its origin, a feeling of pastness, and a conscious evaluation of itself. It is an evocative, first-person experience akin to mental time travel and is the form of remembering involved in recalling childhood events, but not necessarily in reproducing the item apple on a word list. Many researchers converge on the idea that this form of memory is impaired in both healthy aging (relative to younger people) and Alzheimer's disease (relative to age-matched controls).

We also draw on the introspective approach advocated by Gennaro and colleagues (2006) who propose that there are seen and unseen contributions to our understanding of behaviour. Some of this concerns beliefs, attitudes and memory. Let us suggest that someone has a specific 'umbrella-related' memory deficit. Cognitive neuropsychology (at least as a research entity) might be thought of as assessing the ability to remember umbrellas (as compared to remembering raincoats) and factors such as permeability of the umbrella, frequency of rainfall, and when in childhood one first used an umbrella. We believe that a Bio-Psycho-Social model should be at the heart of Cognitive Neuropsychology when it comes to researching memory. At the core of researching umbrella-specific memory impairments we should be asking about what it feels like to be wet, what the person feels about rain, and collate some narratives of forgotten and remembered umbrellas.

The neuropsychological case as 'snowflake'
Most of our neuropsychological knowledge about memory comes from case studies of individuals with brain damage. The complexity of the relationship between brain and behaviour in cognitive neuropsychology has led to the description, 'each patient may be as unique as a snowflake' (e.g. Caramazza & Coltheart, 2006). A specific clean-cut amnesia without other cognitive difficulties is extremely rare and it is likely that self-hood is affected by any cognitive impairment, either directly or as a response to the sudden challenge to one's abilities, independence and so on. Adult development is gradual, diffuse, ever-changing, and memory loss disrupts a range of cognitive abilities which impinge on social functioning and personality.

In brief, our ability to extrapolate from single cases who are as varied as snowflakes requires us to have theories and approaches which can take subjective experiences at face value and incorporate these into a scientific framework. Researchers must think widely about subjective experience and use these additional insights in explaining the behaviour of patients, a point we shall illustrate below by briefly reviewing our work on a very peculiar subjective experience, that of déjà vécu.

What is memory for? Adaptive and functionalist accounts
Cognition is the process by which we have personal views, thoughts and experiences. It clearly defines our social interactions and our understanding of the world. Recollection and mental time travel give humans a unique opportunity to experience and re-experience personal thoughts and to reflect on prior experience. If you simply knew about your honeymoon, but did not remember it, you could not form the same relationship with your past, or reflect upon prior events and outcomes that defined your later self.

Arguably, we should take more account of what memory is for, and therefore pay more attention to what comes to mind, rather than how much comes to mind. Conway (2005) proposed 'a key feature of the approach taken to memory ... is that cognition is driven by goals: memory is motivated.' What is retained in the mind of an individual is a personal history of that self. To study the self, one should look at the contents of what is remembered. Arguably, the investigation of the purpose of memory requires an individual account — we take this view in our work on 'I am ...' statements reviewed below.
Person-centred approaches to rehabilitation

Rehabilitation has been defined as 'a process whereby people who are disabled by injury or disease work together with professional staff, relatives and members of the wider community to achieve their optimum physical, psychological, social and vocational well-being' (McLellan, 1991). The memory performance of healthy older adults and people with Alzheimer's disease can be improved using standard memory manipulations, such as semantic relatedness, repetition and encouraging deep levels of processing (e.g. Moulin, 2002). But merely improving people's memory is not rehabilitation. Rehabilitation must consider selfhood and quality of life. In fact, cognitive neuropsychology is rather advanced in this regard. For instance, Clare et al. (2002) offered person-centred rehabilitation by asking of patients what they would like to improve, and then focused on individual regimes to accomplish this (e.g. learning the names of the players at the golf club). Personally meaningful activities such as knitting have also been used to pinpoint rehabilitation goals for the individual (Adam et al., 2000).

Some examples from our group

Memory awareness

At the centre of the first-person approach is awareness. Contemporary approaches ask participants to reflect on their experience (see Souchay, 2007). In cognitive neuropsychological terms this is 'metacognition', literally knowing what you know. Our research suggests that depending on the types of question asked or the materials used, people with Alzheimer's disease are more or less aware of their abilities. Where awareness fails, it appears to be due to an inability to remember that one has a memory problem. People with Alzheimer's disease do have a reflective faculty to consider their memory function online, but they fail to update their self-concept. That is, their memory deficit is such that they forget that they forget.

One manifestation of this unawareness is memory deficit theory relates to the feeling of knowing (FOK). The FOK is a first-person experience of knowing something whilst being temporarily unable to retrieve it. Usually, one's FOKs are accurate and informed, for example one can accurately gauge whether one will later recognise something that is currently not accessible. People with Alzheimer's disease and healthy older adults have impaired FOK, that is their judgements are less predictive of their later performance.

We suggest that at the centre of this metacognitive problem is a memory deficit. Older adults and indeed people with Alzheimer's disease have an FOK deficit only for episodic materials. Their FOK on general knowledge tests are unimpaired. Moreover, we find that the ability to accurately predict performance in an FOK task is related to memory ability. Older adults' memory is often insufficient to produce reliable cues on which to gauge their performance (Souchay et al., 2007). Thus even where there is a praxis-facial deficit in awareness, on closer examination it appears to be due to the material on which that information is based.

Cognitive feelings

The FOK is a cognitive feeling. Our notion of cognitive feelings is driven by an adaptive stance. That is cognitive feelings operate to interpret and constrain cognitive processes. Another commonly experienced cognitive feeling is the tip of the tongue (TOT) state. This is where we know we know a word, but momentarily cannot access it. The TOT is a state which drives us to consider using another word, to search harder for the word that we want, or to ask someone else to help resolve the situation.

Our research into cognitive feelings is exemplified by work we have undertaken with people who have inappropriate cognitive feelings, for example patient AKP (Moulin et al., 2005). Normally, cognitive feelings operate in harmony with the goals of processing; when we are retrieving information from memory it feels like a memory. However, such feelings can be disturbed by

PSJE Newsletter, No. 106, January 2009
neurocognitive dysfunction. Without a cognitive neuropsychology that aims to validate and examine subjective research, it would be impossible to take this research forward.

AKP was an 80-year-old gentleman who initially presented to his GP with frequent sensations of déjà vu. This sensation was so permanent and persuasive that we termed it déjà vécu, meaning ‘already lived’. AKP constantly confused the present moment for the recollection of one previously experienced. His erroneous cognitive feelings were so compelling that he was unwilling to engage in activities such as watching television and reading the newspaper, as he felt he had already carried them out. Recollective confabulation is a critical feature of this condition. Since recollection is associated with the retrieval of contextual information and experiences at study, patients such as AKP also generate high levels of incorrect contextual information for items that in fact, they have not encountered before. AKP made such reports spontaneously, for instance, confabulating secret early morning trips to the newsagents to read the newspaper as it was unloaded from the lorry whilst his wife was asleep in bed, to justify his feeling that he had read the paper before.

In our group we are now looking at rehabilitation of this false cognitive feeling. It appears that carers and clients are reassured to know that their intensely subjective experiences are in fact a memory error and, though rare, are experienced by others. However, we feel that such cases are underreported, possibly because people are unhappy reporting such strange sensations to clinicians, but also because psychologists have been too focussed on assessing objective performance.

Autobiographical memory

A final theme from our laboratory is autobiographical memory. We have been interested in this perspective in terms of memory deficits and personally significant or striking events. For example, demonstrating that people with Alzheimer’s disease have unimpaired memories for events such as those of 11 September, 2001 (Thompson et al., 2005). We have also begun to map out the cognitive deficits associated with conditions like Parkinson’s disease with recourse to memories of one’s own life (e.g. Smith et al., under review).

Increasingly, our research within autobiographical memory focuses on demonstrating the links between the self and memory, demonstrating for instance, that memories of our own life centre on periods of self-formation (Rathbone et al., in press). In this work people generate their own cues for memory tests and report back to us their memories. First we collate information about a participant’s self, asking them to complete ‘I am ...’ statements. We can then use these ‘self-images’, such as I am a father, to cue autobiographical memories. This approach has shown that across the lifespan, memories agglomerate around important times of self-formation, and we are now beginning to apply the paradigm to older people with memory impairment and depression.

Conclusions:

A return to introspectionism?

How should we measure subjective experience, and be confident that we are reflecting true internal processes, and not the idiosyncrasies of a few select participants? We think there are four general principles that underpin research on subjective experience.

1. Subjective evaluations should relate to actual performance. If someone feels that something has been very well learned, then their performance for that item should be better than their performance for something they feel they have not learned well. The fact that people can predict how well they will perform or how well they have performed, suggests that their subjective reports are indicative of some level of access to mental operations.
2. Subjective evaluations should relate to objective characteristics of stimuli. Different types of materials produce different levels of performance. One such difference is between high frequency words (such as 'computer') and low frequency words (such as 'roulette'). These produce different levels of memory performance, but reassuringly, they generate markedly different reports of subjective experience too.

3. Participants should be able to justify their responses. This is possibly the simplest approach (e.g. Gardiner, 2001). People's justification of responses should relate to their experience, and the way that they have responded to a test. We regularly collect such justifications from our participants, and they can effortlessly discriminate between feelings such as, 'It's vague – I think I saw it before' and 'I made an association with Polka dot. It's a Polish word, it means woman.' It is particularly persuasive if people spontaneously justify their experience, or draw parallels between what you have produced in the laboratory and what they feel in daily life.

4. There should be converging evidence from neuroimaging. If these are truly verifiable subjective processes, it should be possible to 'see' them using neuroimaging. This is one area where an objective approach (neuroimaging) can validate a more introspective one (phenomenology). Consider Rubin's vase, the famous ambiguous figure which can either be seen as two faces, or a vase. Andrews et al. (2002) demonstrated that different areas of the brain were activated when seeing this as a face or a vase. Participants' subjective reports mapped onto activation within their brain. The same has been demonstrated for memory where the responses of different brain regions dissociate according to phenomenology. How subjective experience manifests in the brain is one of the frontiers of neuroscience.

As a final note, we would hope that the stories of older adults' memory experiences are not just seen on an individual level, but can be built up to direct and inform whole research programmes. For this reason we run open-days and focus groups to make sure our research targets the right topics.

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January 2009
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