

Rehabilitation without error

I INTERVIEWED Professor Barbara Wilson at the Oliver Zangwill Centre for Neuropsychological Rehabilitation at the Princess of Wales Hospital in Ely. She is Director here, after founding the specialist unit in 1996 despite odds being heavily stacked against her. It took her three years to persuade the various agencies to join forces and back the project. 'I had some powerful allies *en route* but also some powerful enemies,' Barbara explained. 'Things have recently become easier though.' The Centre now has an international reputation for combining research with clinical practice.

I asked Barbara what had driven her

JIM McCOURT spoke to Professor Barbara Wilson OBE, one of the winners of the BPS Award for Distinguished Contributions to Professional Psychology 2000.

over the years. 'I'm a clinical psychologist, first and foremost. I've specialised in brain injury rehabilitation since 1979,' she said. 'The main reason I'm in rehab is to try and find ways to help people with acquired brain injury be more independent, get back to work...that sort of thing.'

Much of Barbara's research in recent years has been around the idea of errorless

learning, a concept which was revolutionary in its time but which has now become the norm. 'Some people, particularly people with memory problems, learn better if they are prevented from making a mistake while they are learning. In clinical practice there are several ways to prevent or minimise errors, such as physically prompting a response, asking people to follow written instructions, telling them the correct information immediately prior to them giving the answer, and so on. The procedure depends on the problem and the circumstances.'

Initial studies on errorless learning focused on helping people suffering from severe amnesia to learn lists of words, in conditions where they either made mistakes, or were prevented from making mistakes. 'Every single one of our amnesic patients learned more when prevented from making errors.'

A crucial tenet of Barbara's working philosophy is that research must have practical applicability and be relevant to the difficulties faced by those who are fighting disabilities caused by cognitive impairment. 'I don't like the kind of esoteric research which remains separate from real life, so in most of our studies, the client and family choose what it is they want to work on.' Applying this philosophy, she and her team developed errorless learning strategies to enable memory-impaired people to learn more efficiently. 'We did a series of single case studies of a whole range of people with severe memory problems to teach them various things – learning people's names, learning to use an electronic organiser, orientation questions,

and so on. Each time we tried to have a balance – one task in an errorless way, one task in an errorful way, and we tried to equate the tasks for difficulty. Over and over, it came up that people learn better under errorless learning.’

For a practical example Barbara cited a situation where a person with memory problems might repeatedly ask a carer questions about what they are going to do that day, or what they will have for lunch. ‘One application of errorless learning would involve setting up an information board, taking the person to it and reading it to them every time they ask their questions. Through gradually lessening the prompts and shaping the learning the person can learn to use the board for themselves.’

As to how and why errorless learning works, Barbara cites two main possibilities. First, clients with no episodic memory (i.e. no conscious recollection of what has gone before) may be relying solely on their implicit memory, of which they have no awareness. Claparade gave an early example of implicit memory in 1911, when he jabbed an amnesic patient’s hand with a pin one day. The following day the patient declined to shake hands with him, but was unable to say why! Incidents like this, Barbara explained, suggest that learning can take place without conscious awareness, which means errors are not easily amended and should therefore be avoided.

However, a second view contends that clients whose explicit or episodic memory remains, albeit in an impaired state, are in fact using that system to learn tasks. Both explanations have some validity, and different people may employ one or the other depending on the severity of the memory impairment.

Perhaps the most exciting application of errorless learning has been the work conducted by Linda Clare, a colleague of Barbara’s for some time, who has recently used the technique with people suffering from Alzheimer’s disease. She has found that when people with the disorder are taught under errorless learning conditions (e.g. to remember people’s names) they may retain this information over a lengthy period, despite the progression of their illness. Some of the findings need replication, but the potential may be enormous.

‘Errorless learning is now pretty widely accepted. People talk about errorless rehabilitation and memory rehabilitation, and they tell me about it. They don’t even know I was the first person to introduce it,

which is quite nice really because it has become such an accepted principle.’

More recently Barbara has been involved with another project. ‘NeuroPage refers to the software that drives a pager. The system was developed by the father of a young man who had a severe head injury. I think that is one of the reasons it has been so successful, because it was designed for a brain-injured person, rather than adapting existing technology. It’s a pager, worn on

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a belt, that will either beep or vibrate as soon as the alarm sounds. The wearer looks at the screen, and it tells them what to do – for example, take your medication. At its simplest level it acts as a competent reminder. The technology holds the memory the client does not have – a prosthetic memory.’

The NeuroPage system is run from the Oliver Zangwill Centre where staff members manage the system. ‘They will check with families and patients what messages should go out in the week. Then these go into a computer, and are transmitted to the individual pager. One of the reasons it is so effective is that it is simple to use, all people have to do is read the message. Some clients have had up to 40 messages a day, but others might need only three. It is very flexible, and can be easily graded to match the needs of the individual. You can have one-offs like happy birthday, or things that need to happen regularly like feed the dog. As with errorless learning, its principles can be applied to a wide range of people in real-life situations.’

Research findings with NeuroPage have been encouraging. ‘We did one pilot study with 15 people, including a six-week baseline period, a treatment period, and a post-baseline period. For the group as a whole, before they had the pager, their success rate at achieving whatever targets they had selected was 37 per cent – so they were missing most of their target behaviours, for example, not taking their medication. When they got the pager, the success rate jumped up to 87 per cent – a huge difference! Of course, there is variation within the group, but every single

one of them showed a statistically significant improvement from baseline.’ A further study, just published, showed similar results with 143 patients (Wilson *et al.*, 2001). Ongoing research is exploring the use of NeuroPage with children, or clients with learning difficulties, and using variations such as voice-activation, or varying tones.

The NeuroPage project also represents a good example of co-ordination between commercial, theoretical and clinical fields, all coming together to create something of practical use. This notion of drawing on various aspects of psychology to form a broad and effective means of treatment is one of the main threads running through Barbara’s work. ‘I feel strongly that, particularly in rehabilitation, if you don’t integrate a number of fields, if you just stick to one theory or methodology, you constrain yourself – it’s too limiting. Clinical psychology is both a science and an art.’

Strong convictions are evident in the interview concerning the relationship between research and clinical work. Barbara finds it odd that psychologists say they can’t do research because their clinical practice is too busy. ‘If you are writing notes on your patients or preparing for them or planning their treatment, you can do these things in such a way that they become part of your research. I have always seen clinical work and research as going hand in hand. I can’t really understand the point of view that they have to be separated – that could be due to the way I was taught, which encouraged accurate monitoring of what you are doing.’

We rounded off the interview with Professor Wilson stating her belief that neuropsychological rehabilitation needs a broad theoretical base incorporating theories, models and frameworks from a number of different areas: ‘No one model is sufficient to address all the problems faced by people with brain injury. We need models of cognition, recovery, behaviour, learning, compensations (which include NeuroPage and technology), learning (including errorless learning) and emotion to deal with anxiety, depression and other mood disorders that follow injury to the brain.’

Reference

Wilson, B.A., Emslie, H.C., Quirk, K. & Evans, J.J. (2001). Reducing everyday memory and planning problems by means of a paging system: A randomised control crossover study. *Journal of Neurology, Neurosurgery and Psychiatry*, 70, 477–482.