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NEUROPSYCHOLOGICAL PRINCIPLES APPLIED TO REHABILITATION OF A STROKE PATIENT

SIR,—Recovery from brain injury often involves the relearning of everyday tasks. Patients tend to do these tasks using overlearned automatic strategies that are now impaired, so before a task can be mastered it may be necessary to divide it into components novel enough to demand processing that is not part of an automatic sequence. The components should provide feedback; they should be simple and not make heavy computational demands on the brain; and as far as possible they should involve processing for which the intact areas of the brain are specialised. This approach is illustrated by a 55-year-old right-handed woman whom we examined 6 months after an acute occipital infarction affecting both lobes and on the right extending into the parietal lobe. Visual disorientation was combined with a mild left hemiparesis and signs of right parietal dysfunction. There was a lower field deficit in both eyes within which objects were perceived only when they moved. She had difficulty in walking, reading, writing, and dialling.

The immediate awareness of depth had been lost, although she could deduce the distance of objects by a lengthy process of conscious inference. When the patient saw many different objects moving rapidly with respect to one another (eg, in a crowded shopping area) those approaching her appeared to "loom", even when quite distant, and she would flinch away and lose her balance. To classify objects as "near" or "far" she was told to glance down her nose when walking towards an object and to take avoiding action only when the image of the tip of her nose coincided with the visual contour between the base of the object and the floor. This strategy gave her confidence in moving about the hospital and within a few days the technique became automatic. The strategy simplified perception of depth and reduced the demands on spatial processing within the right hemisphere.

Her left foot dragged as she walked and tended to hit obstructions. She found it useful to wear white socks and dark trousers to improve the contrast. In general objects could be recognised more easily if they differed in colour from their backgrounds, so coloured adhesive labels were used around the patient's home as cues to position, and cups with a white interior and coloured exterior were selected. The neural computation required to identify an object is greatly reduced if an object can be discriminated from its background by brightness or colour contrast.

A loss in visual acuity, due to an exaggeration of the effects of contour crowding, meant that the patient was unable to read. The following device enabled her to read small amounts of 10-point text. Text was viewed monocularly through a 4 cm diameter tube 30 cm long, at the distal end of which was placed an 8 dioptre lens in front of a rectilinear mask. The mask could reveal one six-letter word, which appeared magnified by about 3. For looking at telephone directories she used a bar magnifier masked with black adhesive tape that revealed one line at a time. Elimination of unnecessary visual contours and the enlargement of those requiring attention simplifies visual processing.

Her many errors in spelling and letter formation disappeared when the patient was instructed to articulate the word as she wrote it, thus processing at a level lower than that customary. At first she could not read what she had written. Then she found that she could read her own writing when it was on an overhead projector.

She made many errors with telephone numbers on a rotary dial, especially with the high numbers in the lower left portion of the dial. These errors were eliminated when she was told to make sure that the number required was covered by the finger and disappeared from view when the finger was inserted. Again, this strategy interfered with the impaired automatic performance of the task.

This experience illustrates the importance of avoiding automatic processes that are impaired, of simplifying cognitive processing, of providing feedback on the performance of task components, and of encouraging processes that use undamaged brain areas. Verbal processes in the left hemisphere were, presumably, used to perform tasks hitherto done spatially with areas in the right hemisphere; visual tasks were simplified by apparatus that reduced unnecessary visual information; and linguistic tasks were helped by preventing automatic overlearned processing and by directing attention towards simple verbal components.

The patient, a lecturer, was articulate and well able to describe her problems and to understand the strategies used. We thank her for the insights she provided and hope that the techniques that have helped her may benefit others with similar problems, including those less able to help themselves.

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HAEMORRHOIDS AND DEFAECATORY HABITS

SIR,—Constipation is associated with haemorrhoids[1] in western man. We examine the hypothesis that "poor" defaecatory habits (straining, reading, length of time defaecating) may also be associated with haemorrhoids.

100 consecutive patients attending a clinic for the treatment of proctoscopically verified haemorrhoids were compared with 100 age and sex matched general surgical outpatients. Controls were excluded if their condition was one associated with Cleave's hypothesis on low dietary fibre intake.[1] All patients answered questions about their history of haemorrhoids, bowel motions, defaecatory habits, and diet, and they recorded the time spent sitting on the lavatory during defaecation. Both groups were examined digitally and proctoscopically, and controls found to have asymptomatic haemorrhoids were excluded. The haemorrhoid group comprised 66 males and 34 females. 10 were in the 2nd, 17 in the 3rd, 26 in the 4th, 16 in the 5th, 21 in the 6th, and 10 in the 7th decade of life.

The controls spent significantly less time during defaecation (table) and significantly more haemorrhoid patients either read (29 *vs* 13, $p < 0.01$) or strained (42 *vs* 9, $p < 0.001$) during defaecation. 48 haemorrhoid patients thought that constipation preceded the onset of their haemorrhoids, whilst 20 thought the reverse. Almost all patients had heard of a high-fibre diet and the two groups did not differ in their consumption of unprocessed bran (24 haemorrhoid *vs* 18 control patients), bran-based breakfast cereals (37 *vs* 21), or wholemeal bread (59 *vs* 62).

Previous studies in western man[2-4] have suggested an association between constipation, straining, and haemorrhoids, but little attention has been paid to defaecatory habits,[5] which are, in part, socially determined. We found that patients with haemorrhoids tend to spend longer defaecating and also are more likely to read and strain while defaecating than are patients without haemorrhoids.

TIME AT STOOL

Time (min)	Control	Haemorrhoid
<1	22	7
2–5	57	42
6–10	19	26
11–15	2	25

A χ^2_c test (on a 2 × 2 table pooling <1 with 2–5 and 6–10 with 11–15 min) gives $p < 0.01$.