

## The assessment and remediation of memory disordered patients\*

Robert G. Knight

Department of Psychology University of Otago

David G. Andrewes

Institute of Psychiatry London

Attempts to improve the memory skills of amnesic patients are reviewed and the contribution psychologists may make to the remediation of such patients is considered. Although the literature provides a number of instances where the memory performance of chronically impaired amnesics has been enhanced, the cause and the longevity of these gains are often in doubt. The evolution of memory assessment scales which are relevant to planning therapy is discussed and recent studies evaluating the efficacy of various mnemonic procedures for individual or group interventions are reviewed.

In the past decade there has been an impressive growth of interest by clinical psychologists in providing services for neurologically impaired patients (Costa, 1983; Miller, 1984). Traditionally, psychologists have been employed in the assessment of brain-damaged patients, but until recently, their major contribution to the management of such patients has been based on their training in the administration of standardized testing procedures. As therapists, psychologists are comparative latecomers to this field, where the best established methods of remediating deficits in brain-injured patients, which focus on the restitution of language function and motor coordination, are already part of the expertise of other professions, such as occupational or speech therapy. There is, however, an obvious need for procedures designed to improve the level of functioning of amnesic and dementing patients and psychologists are playing an important part in implementing new approaches to the rehabilitation of these patients. This is an appropriate professional development, since the discipline of psychology has a long tradition of research and theoretical speculation on the nature of memory

and intelligence, and considerable pragmatic experience with the issues involved in their measurement.

The focus of this review is on the outcome of this involvement in the rehabilitation of amnesic patients and the knowledge that has been acquired about techniques for improving their memory skills. Before turning to the research generated by practitioners however, it is perhaps of interest to consider the impact which the experimental investigation of amnesic patients has had on the development of memory therapy procedures. The assumption which supplied much of the impetus for the early research on the performance of organic amnesic patients on a variety of learning and memory tasks, was that a specific deficit might be uncovered which would explain the total pattern of performance decrement of such patients. Amongst other implications, finding such an intrinsic deficit would have had the practical consequence of allowing assessment techniques to be more precisely focussed and rehabilitative strategies to be developed which either remedied or substituted for the specific skill loss. Several methodological and conceptual problems have hampered the search for such a deficit. These include the difficulty of drawing conclusions from experiments where tasks have not been matched for

\*Address for correspondence: Robert G. Knight, Department of Psychology, University of Otago, Box 56, Dunedin, New Zealand.

discriminatory power (Chapman & Chapman, 1973; Knight & Wooles, 1980), and Schacter & Tulving (1982) detail several instances where matching failure has invalidated the conclusions drawn from the study. The continual evolution of memory theory (Broadbent, 1984) and the obsolescence of research paradigms employed by cognitive psychologists has also been a continual problem for clinical experimentalists, whose research strategies may be undermined by these shifts in emphasis. In addition, many patient groups have disorders with complex aetiologies which make isolation and comparison of intrinsic deficits problematic.

Leaving aside the many methodological problems however, it must be said that the efforts to locate a specific deficit which would explain amnesia, have generally been disappointing. Early theories accounting for anterograde amnesia as a retrieval deficit (Warrington & Weiskrantz, 1974) or a specific encoding problem (Cermak & Reale, 1978), have been superseded by a conception of amnesia as a more generalized failure of the memory system. Cermak (1982) has recently presented this view most graphically when he concludes:

"We are left, then, with the knowledge that amnesic patients' entire information-processing-for-memory system is impaired to some extent . . . It is not simply a leak in the plumbing, it is a disintegrated plumbing system. Stopping one leak only makes the water come out somewhere else faster."

(p.56).

In part, the move away from the specification of amnesia as the outcome of a single failure in the processing system has been a reaction to an increased awareness of the methodological limitations of the evidence for such circumscribed deficits, as well as the demonstration that failures at more than one processing stage may occur (e.g., Diamond & Rozin, 1984; Fuld, 1976). Equally important as the view that amnesia may have many causes, is the persuasive argument that amnesia is indiscriminable from normal memory weakened by various methods such as the introduction of long recall delays or the presentation of the information to be recalled very briefly (Meudell & Mayes, 1982, 1984). Meudell and Mayes (1982) contend that in those instances where weak normal memory has been compared with amnesic performance, the pattern of results for both groups has been the same (Mayes & Meudell, 1981a, b; Mayes, Meudell &

Neary, 1978; Mayes, Meudell, & Som, 1981; Meudell & Mayes, 1984; Mortenson, 1980; Squire, Wetzel, & Slater, 1978).

The apparent similarity of amnesic performance and weak normal memory, together with the failure to find a breakdown in a particular stage of the memory processing system, has made it reasonable for psychologists to look more closely at the possibility that techniques for improving normal memory may also benefit amnesics. Accordingly, many clinicians have turned their attention to the process of ameliorating amnesic disorders. Before turning to a review of the work that has resulted from this relatively new interest, it is important to consider the way in which methods of assessing amnesic patients have developed to meet the need to collect data relevant to planning and evaluating therapy.

#### *Assessment of memory impaired patients.*

Currently, the importance of diagnosis as the primary rationale for the psychological assessment of neurological patients is declining with the availability of improved physical methods of establishing the presence of lesions and those psychometric tests designed solely to maximize the prospect of detecting organic impairment are becoming of less relevance to the clinician (Miller, 1984; Walsh, 1978). Instead, the emphasis is on documenting the behavioural efforts of demonstrable organic lesions, monitoring the course of deficits over time, and contributing to the planning of therapy. At the present time several standardized memory test are in widespread use (for a review see Erikson & Scott, 1977; Lezak, 1976): for example, the Wechsler Memory Scale (WMS; Wechsler, 1945); the Williams Scale for the Measurement of Memory (Williams, 1968); The Benton Visual Retention Test (Benton, 1974); and word learning tests (Inglis, 1957; Walton & Black, 1955). New tests continue to appear in the literature from time to time (Kendrick, Gibson & Mayes, 1979), and revised procedures for previously established tests are developed (e.g., Kraemer, Peabody, Ticklenberg, & Yesavage, 1983; Russell, 1975).

For the psychologist working with memory impaired patients in a rehabilitation setting, the advantage of using a battery of standardized tests is that the results will confirm the existence of dysmnnesia and give some indication of the level of severity. This latter consideration is often important in sample definition for research purposes. Further, testing of this nature may be

relevant in exposing modality or material specific defects which might be important in planning therapy. Modality specific problems may also be apparent on other measures which assess language skills, agnosias, or perceptual-motor disturbances. However, there are three major limitations in using most standardized tests of memory, when considering a comprehensive examination of the dysmnestic patient. First, it is difficult to translate test scores into a form of documentation which can be readily conveyed to other professionals. For example, a Memory Quotient from the WMS can be converted into a general diagnostic statement, but not easily interpreted as an indication of what a patient is, or is not, likely to be able to learn or retain. In other words, most memory tests have not been criterion referenced in any useful way. Exactly the same problem in the assessment of the congenitally mentally retarded child led to the preparation of more behaviourally relevant criteria for defining cognitive skills and social competence. The development of analogous measures for the assessment of neurological patients is clearly overdue. Second, the range of memory skills required of patients by tests like the WMS are typically narrow, being confined to testing their performance on laboratory derived memory tasks. This creates problems in the selection of appropriate behavioural targets for intervention. Third, the benefits of remediation are likely to generalize only to a limited extent. Most currently available tests are therefore likely to be of only limited value in assessing outcome of therapy. For example, it is improbable that a patient who has been trained to orient himself successfully within the hospital grounds will show a concurrent improvement on the Associative Learning subtest of the WMS.

There are several more practical procedures which may be considered for use with patients referred for remediation of memory function. These include:

(a) The use of self-report memory questionnaires which assess patients perception of their difficulties. Several questionnaires of this type are available (e.g., The Subjective Memory Questionnaire, Bennett-Levy & Powell, 1980; The Inventory of Memory Experiences, Hermann & Neisser, 1978; The Cognitive Failures Questionnaire, Broadbent, Cooper, Fitzgerald & Parkes, 1982; Sunderland, Harris & Baddeley, 1983).

(b) Behavioural diaries. Another simple self-

report method is to provide patients with diaries and instructions to record instances of memory failures in their everyday lives. The output can then be used for more precise behavioural targeting (Brooks & Lincoln, 1984).

(c) Observation. As Sunderland et al. (1983) note, filling in a questionnaire about personal memory functioning is in itself a test of memory, and with patients who are grossly impaired or have limited insight, observational ratings may be more satisfactory. Sunderland et al. (1983) administered their questionnaire to both patients and close relatives, and found that results from the relatives' questionnaires correlated highly with the cognitive test performance of normal and long-term head-injured patients but not of the more recently head-injured cases, whose recovery had not yet stabilized. A revised 28-item version of this questionnaire has been modified for use by staff working in an inpatient setting (Wilson, 1984). A similar 10-item rating scale has been developed for use with chronic dysmnestic alcoholic and Korsakoff patients (Knight & Godfrey, 1984).

(d) Direct behavioural measures. The data from self-report or observational measures will suggest appropriate clinical process monitors and outcome measures, relevant to the pattern of behavioural deficits of individual patients. Examples of behavioural indices include accuracy of remembering appointments, speed of learning new routes about the hospital (Wilson, 1984), recall of lists of names (Wilson, 1981) or verbal instructions (Knight & Godfrey, 1984), recall of prices of everyday grocery items, rate of learning a new skill like operating or assembling an electronic device, and accuracy of information recalled from newspaper articles.

When considering an appropriate assessment strategy with amnesic patients, the over-riding concern is that it provides all the information needed to tailor remediation to the needs of individual patients. The first concern is to evaluate the severity of the disorder and the extent to which the amnesia is part of a global intellectual deterioration. A preliminary diagnostic formulation combined with data from standardized tests will determine the general rehabilitative strategy most likely to benefit the patient. If the memory deficit is part of a progressive confusional or dementing state, and the amnesia is relatively severe, as is frequently the case with patients who suffer from Alzheimer's disease, Huntington's chorea, or severe alcoholic

dementia, then procedures such as Reality Orientation Therapy (Holden & Woods, 1983) may be indicated. However, if the amnesia is a circumscribed condition, either stable or improving, and relatively mild in degree, then a programme focussing on teaching more generalizable mnemonic strategies may be considered. Patients with memory impairment subsequent to disease, neurosurgery or trauma are more likely to be receptive to such an approach. A marked difference in impairment with respect to type of presentation (e.g., verbal versus non-verbal, visual versus auditory), may determine the way in which new information can best be presented. Once the general approach to therapy has been decided, individual goals can be set and monitored using self-report data and behavioural observation of the patient. Throughout the entire assessment phase it is vital to keep the significance of the patient's memory problems in perspective (Brooks & Lincoln, 1984). Frequently, even a severe cognitive deficit has little influence on whether a patient returns to the community. Other considerations such as a deviant drinking pattern, abusive behaviour, or level of social support may be far more important. A rational approach to the treatment of amnesics using any of the therapeutic manoeuvres discussed below needs to balance carefully the significance of the memory problem against any other such factors when setting behaviour change targets. Consideration needs also to be given to the patient's motivation, especially when the resources and time available for therapy are limited.

#### *Memory therapy.*

The steps involved in planning an individual programme for an amnesic patient are common to most behavioural interventions. It is necessary to specify precisely the behaviour to be changed, to develop a measure of the targeted deficit, and to define clinical outcome criteria. The next stage is to introduce a rehabilitation programme designed to enhance the skill deficit. Such a task should have an appropriate range of difficulty levels, be practical in terms of staff involvement and the facilities available, and be capable of quantification so that progress can be monitored. Where single subject designs are used, treatment should be implemented so as to allow controlled evaluation of the outcome. These are the general and well established principles of behavioural intervention. What is specific to the remediation

of memory difficulties are the tasks and cognitive strategies which may be taught to amnesics. These procedures can be divided into two groups, those that use external memory aids and those which teach the use of internal strategies (Harris, 1984; Powell, 1981). Internal strategies refer to various methods for aiding memory without reliance on any external factor for cueing or prompting recall. Internal strategies include the use of verbal mnemonics, visual imagery, organized rehearsal, and various kinds of study methods. The application of internal and external strategies which have been used to help patients overcome specific memory problems will be considered below, first by reviewing individual techniques and then by discussing how they have been applied in a group setting.

#### *External strategies.*

Techniques of recording or cueing recall of information which are located external to the organism are amongst the most frequently used methods of extending memory capacity. There are two important aspects to the use of external aids: storage and method of access (Harris, 1984). The amount of storage available for acquired information can be enlarged readily and examples of community repositories of collective memories include libraries, computer data bases, and office filing systems. On the personal level, the use of diaries or lists provide instances of the use of external devices for holding important information until it is needed. However comprehensive the data base may be, its usefulness will, to a large extent, be determined by the ease of access to what is available in the store. It is no use preparing a careful timetable of events in a diary, if the diary is not consulted at the right time. In addition to increased storage, cues are needed to initiate the action of checking the register of information contained in external storage. For personal use, a prosthetic memory device needs to be portable, easy to programme with multiple messages, and able to provide an active cue, like a buzzer sound, to remind the user to check for messages. Although a number of commercially available devices (Shenton, 1975; Harris, 1984) such as multifunction wristwatches and electronic calculators have some of the facilities necessary to make useful memory aids, their value is sometimes limited by a patient's inability or reluctance to learn the manipulative operations necessary to store input or set the timer on an electronic device. For many

patients the most important external aid may be a pocket diary. Kurlycheck (1983) combined the use of a diary with a digital alarm clock which sounded every hour to remind a patient with Alzheimer's disease to check his diary. With grossly amnesic inpatients, staff can check every day or week that major appointments or timetables are accurately recorded in the patient's diary, perhaps fading the amount of prompting given to ensure the diary is up to date, and reinforce the patient's consultation of the diary when the hourly cue sounds.

Davies & Binks (1983) made considerable use of external aids in training a Korsakoff patient to function independently outside the hospital setting. Like Kurlycheck (1983), they combined the use of a pre-set signal to cue consultation of a list of commands. They also applied an interesting method to increase the appropriateness of communication between the patient and those people with whom he interacted. A prompt card was provided, which he was trained to show people he dealt with, which asked strangers to communicate clearly with him, and where necessary, record information in his diary. This prompt system worked well, and was still in use by the patient a year after its use was initiated. Methods of aiding the amnesic by encouraging the use of diaries, lists and setting up a blackboard or a similar device on which patients may leave themselves reminders, are simple to organize and often remarkably effective. As well as introducing new aide-memoires, an initial step in considering the use of external aids should be to discover any aids which the patients already use or have used extensively in the past. Appropriate restructuring of the environment to increase the amount of externally available information, may be the method of memory enhancement most helpful to the densely amnesic patient, particularly those with signs of concurrent dementia. Internal strategies, in contrast, are more appropriate for patients who have some insight into their disorder, and who are therefore more likely to have the motivation to rehearse and practice such methods, a necessary prerequisite for their success.

#### *Internal strategies.*

(a) *Visual imagery.* The question of whether amnesic patients benefit from the use of visual imagery strategies in experimental situations has been a matter of some controversy (Baddeley, 1975; Baddeley & Warrington, 1973; Cermak,

1975). Visual imagery mediation techniques typically involve teaching the subject to learn the association between two items by linking them in an interacting and novel or bizarre image. The usefulness of imagery mediation has been demonstrated with normal subjects in experimental settings (Bower, 1972; Paivio, 1969), but it has not always proved possible to demonstrate the same effect in amnesics. However, Howes (1983) has recently shown that amnesic Korsakoff patients can benefit from both experimenter assisted and self-generated imagery mediation, and previous discrepant results are probably a function of the training techniques used and their acceptability to amnesic patients. Many amnesics find the notion of generating imagery in this manner a rather alien idea, and level of motivation can influence results (Crovitz, Harvey & Horn, 1977).

Much of the experimental work with amnesics has involved attempts to demonstrate the efficacy of imagery techniques in enhancing recall and these techniques have not been taught to subjects with any long-term benefits in mind. The advantage of imagery training over rote-learning or no-instruction conditions has been demonstrated for alcoholic inpatients (Binder & Schreiber, 1980), left-hemisphere stroke patients (Giasparanni & Satz, 1979), for some unilateral temporal lobectomy patients (Jones, 1974), for brain-injured patients and controls (Lewinsohn, Danaher & Kikel, 1977; Glasgow, Zeiss, Barrera, & Lewinsohn, 1977), and for Korsakoff patients (Howes, 1983). The problem with applying visual imagery mediation is that it is a method most useful for learning lists of high-imagery paired associates — not the kind of task most people commonly face in their everyday life. The most useful application is probably in learning face-name associations (Moffat, 1984). Here patients are taught to identify the most prominent features of a person's face and to link this to their name by creating some common image. A name like Hills can be linked with a large nose, or the name Webb with a person's hair or lined face. The difficulty with this technique is immediately obvious to anyone who attempts to apply it when meeting someone new — it is almost impossible to greet someone and initiate conversation while earnestly searching their face for images to associate with their name. The best use of imagery based face-name learning with amnesic patients may be in the ward setting where the patient

needs to acquire slowly the names of staff and fellow patients. Imagery associations can be built up gradually and this method has the added advantage of stressing the importance of looking carefully at the physical characteristics of the face of the person whose name is to be recalled.

(b) *Memory peg systems.* The basic system requires the learning of a list of easily visualized peg-words, which can be linked to any new list of items to be learned, by the formation of unusual images between each item on the list and the peg. This allows lists of items to be recalled in their correct sequence. Patten (1972) presented an example of the use of such a system when he created a peg-list, the first three items of which were: 1. with the word tea, 2. with Noah, and 3. with Ma. Visual images were associated with each of these three peg-words. If the new list to be learned consisted of the three items radio, airplane, and lamp, then the first of the new items might be learned by forming the image of a person drinking tea from a radio, the second by seeing Noah with his animals in an airplane, and the third by imagining your mother with a lighted electric bulb in her mouth. Recalling the peg-list automatically allows recall of the new list. A related technique is to learn to associate a phonetic sound with each of the digits 0 to 9. Long digit strings can be recoded into letters which form words which in turn can be linked using visual images. Learning the association between peg-words and list numbers can be facilitated if the words rhyme with the numbers (e.g., one is the sun, two is a shoe, etc.). The method of loci is another technique in which environmental cues well known to the mnemonist are used in prearranged sequence to remember a sequence of times. In general, the peg-word mnemonics have proved to be useful with normal subjects (e.g., Morris & Reid, 1970; Patten, 1972). Patten (1972) has also shown that learning a peg-word list may have beneficial effects from patients, although such effects are most likely to be observed in less severely impaired patients (Wilson & Moffat, 1983). The usefulness of this method may well be confined to teaching its use to those patients who actually need to retain lists of information and who, for some reason, are unable to prepare written notes. In everyday life, making written tests is usually an acceptable substitute for committing a series of items to memory. Therefore, many of these procedures may be of less use than they at first appear. Nevertheless, they may serve to give patients

more confidence in their memory skills, and may be especially useful when learning is being tested under examination conditions, for example, when sitting a driving licence test or trade certificate.

(c) *Verbal mediation.* Methods involving verbal mediation require subjects to remember the association between two words, by finding a word common to both which can be used as a link (Cermak, 1975). Where a list of words are to be learned, the patient is taught to put all the words into a single sentence, which should be as unusual or bizarre as the patient can contrive (Crovitz, 1979). Verbal mediation is similar in many ways to imagery mediation, although with verbal methods, the emphasis is on using over-learned semantic associations to strengthen new links between words. Gianutsos and Gianutsos (1979) have found this technique to be of value in training four brain-damaged patients. Similarly, Cermak (1975) found that verbal mediation enhanced Korsakoff patients' performance on laboratory based memory tasks, and Kovner, Mattis & Goldmeier (1983) found that a group of five amnesic patients with mixed diagnoses performed better on verbal recall and recognition tasks under verbal mediation instructions, than when selectively cued for recall.

(d) *The PQRST study method.* Glasgow et al. (1977) introduced the PQRST study method (the acronym stands for Preview, Question, Read, State, and Test; Robinson, 1970) as a means of developing the ability of a brain-damaged patient to learn information for prose paragraphs. Essentially the patient is taught to extract the meaning from a prose passage in a newspaper or magazine article and to test that the newly acquired information has been accurately assimilated. The advantage of this method is that it addresses a problem many patients experience, the inability to remember current events and incorporate this knowledge into everyday conversation. External aids may be difficult to consult in this context and a strategy which makes spontaneous recollection of internally stored events more likely is of considerable use, particularly with more mildly impaired patients.

(e) *Alphabetical cueing.* One of the commonest strategies used by crossword puzzlers searching for a correct word is to work systematically through the alphabet, trying out each letter as a cue. Having the first letter of a word or the first three letters (e.g., Warrington & Weishraniz, 1974, 1978) immeasurably improves access to

the words one is attempting to recall. First letter mnemonics have been used by generations of students to recall lists of anatomical facts, for example, the 12 cranial nerves. Recently, Morris, Wheatley, and Britton (1983) have demonstrated that demented patients are able to remember more words if given first letter cues. The only reported use of this technique as a rehabilitative aid with amnesic patients, is Jaffe and Katz (1974) who taught a Korsakoff patients names of staff members using prompted recall.

#### *Group approaches to therapy.*

As the use of mnemonic strategies for rehabilitating brain-injured patients has become more widely known, the demand for such training has increased. This has led to the use of group sessions, which has the advantage of being more economical in terms of therapist time. Several reports of the running of groups designed to remediate amnesic patients have recently emerged (Wilson & Moffat, 1984; Godfrey & Knight, 1984). Group procedures have the additional advantage of enhancing the range of social interaction and encouragement available to the patient, as well as exposing patients to a wider range of deficits in others and the methods they use to deal with them. Wilson and Moffat (1984) describe in detail the running of two different group programmes which involve many of the external and internal mnemonic aids mentioned above. Outcome evaluations of these groups have not been completed although preliminary data from a cross-over trial, using problem-solving groups as a non-specific activation control, suggests that both treatment groups improve significantly although this was apparent on only some memory measures. Godfrey and Knight (1984) used orientation training, rehearsal, and practice with visual imagery, with a group of six randomly assigned dysmnesic alcoholics. Performance by the experimental subjects, after the 8-week memory programme, was compared with performance by a control group who had undergone the same number of non-specific activation sessions. After daily group sessions for two months, Godfrey and Knight found that both the memory and the activation control groups improved on a number of memory tasks. These data are not encouraging, suggesting as they do that non-specific treatment procedures may be equally as effective as programmes incorporating memory training tasks. However, these results should be interpreted cautiously bearing in

mind the small number of subjects trained to date, and the length of training and the limited range of techniques employed.

#### *Reality Orientation Therapy*

Reality Orientation Therapy (ROT) was introduced as a procedure for improving the functioning of confused psychogeriatric patients by providing systematic training in spatial, temporal, and personal orientation (Folsom, 1968). Although there are many procedures which have been described as ROT (Holden & Woods, 1982), the aim of improving communication skills and reducing disorientation are common to all. Staff are encouraged not to reinforce confused talk, to remind patients who and where they are, and to provide for patients an ongoing explanation of all that is going on around them. External memory aids such as calendars, signs, clocks, and colour coding to denote rooms or areas with different functions, are used extensively. As well as changing the pattern of staff-patient interaction, classroom training sessions may be used, in which patients meet in small groups to rehearse information relevant to their current orientation in the ward and their own personal background. Typically, activities are adjusted to take account of the patients' level of functioning and repetition with faded prompts is used to teach patients specific facts relevant to their everyday life.

A number of studies have evaluated the effectiveness of ROT (see Holden & Woods, 1982, and Moffat, 1984, for a more detailed review). ROT has been shown to be more effective than non-treatment in improving verbal orientation and current information (Brook, Degun & Mather, 1975; Citrin & Dixon, 1977; Hanley, McGuire, & Boyd, 1981; Harris & Ivory, 1976). When ROT has been compared to other treatments, or non-specific activation control groups have been used, results have been more variable. McDonald & Stettin (1978) failed to find any advantage for ROT over other forms of treatment, although Holden & Woods (1982) note that they may have used a level of ROT activity inappropriate to the patients being treated. In a well controlled study by Woods (1979), outcome for patients undergoing ROT was compared with those from a social therapy group and ROT was found to improve significantly patients' scores on the WMS and on measures of orientation and information.

One relatively consistent finding from studies evaluating ROT has been that the effects of

therapy do not generalize beyond improvements in the recall of the specific items of information taught (Powell-Proctor & Miller, 1982). Both Woods (1983), working with a single Korsakoff amnesic, and Goldstein, Turner, Holzman, Kanagy, Elmore and Barry (1982) have reported that ROT did not generalize to orientation items not rehearsed in classroom sessions. Similarly, a number of studies have shown that improvements in verbal orientation do not generalize to improved social interaction or ratings of ward behaviour (Goldstein et al., 1982; Hanley et al., 1981; Harris & Ivory, 1976; Woods, 1979) or to relatives' ratings of patients' behaviour (Greene, Nicol, & Jamieson, 1979). These results are similar to those found for group memory training procedures with chronic alcoholic and Korsakoff patients (Godfrey & Knight, 1984). Failure of generalization is hardly surprising with ROT, considering that the emphasis in training is on learning facts by rehearsal. Unlike those approaches that involve teaching general mnemonic skills, little effort is made to build generalization in ROT procedures. The history of behavioural intervention suggests that unless generalization is deliberately incorporated when therapy is conducted, it is unlikely to occur spontaneously.

### Conclusions

This survey of the literature suggests that teaching mnemonic strategies to amnesic patients, particularly those with circumscribed and mild memory deficits, is feasible and likely to improve their performance on standard measures of memory. Similarly, the use of external aids to improve memory has been also demonstrated to have benefits for some patients. The clinical psychologist intending to apply such procedures should, however, bear the following cautions in mind:

(a) For a therapeutic programme to be effective, it is important that it is tailored to meet the needs of individual patients. Therefore, assessment must be beyond traditional measures of memory which provide data primarily about the severity of the disorder, and focus on quantifying the deficits in the patients' behavioural repertoire which actually incapacitate them in everyday life. Use of the laboratory based cognitive tests which neuropsychologists have traditionally favoured is limited in planning and evaluating therapy.

(b) Less impaired patients are more likely to benefit from learning sophisticated and generalizable mnemonic techniques. More modest and specific goals, and greater reliance on external aids and rehearsal, are likely to be necessary for those patients with severe or progressive dementias.

(c) Generalization from training tasks to other situations involving memory is unlikely to occur as a simple by product of a patient's involvement in memory therapy. Cognitive training does not necessarily function to strengthen mental "muscles" and it is important to plan for generalization when preparing a memory training programme. Although little is known about how to promote generalization in this instance, teaching a variety of mnemonic methods, and practising them in many different contexts and with a range of materials, is likely to be important.

(d) More attention in the future is likely to be focussed on the problems of maintaining the use of memory skills and aids. To date, little has been done to research how long therapeutic gains are maintained. There is some suggestion, however that they tend to be short-lived, (Lewinsohn et al., 1977) and the implementation of 'booster' training sessions are likely to be required.

(e) Controlled trials of memory therapy in a group setting versus non-specific activation, using techniques other than ROT, have only rarely been attempted and research in this area is in its infancy. Results from group comparison studies, although limited to a small number of subjects and techniques, are not encouraging. Results from Godfrey and Knight (1984) and preliminary data from Wilson's (1984) groups, suggest that any comprehensive activation procedure, regardless of the amount of emphasis on memory skills, may enhance memory functioning. The effects of therapy may therefore be limited to improving recall of specific items of orientation and information, and any generalization which occurs may be the result of general activation.

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