INTRODUCTION

Memory and Clinical Psychiatry

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Memory is at the core of a heated, ongoing debate in psychopathology as evidenced by the recent articles published in The Canadian Journal of Psychiatry (1,2). Mnemonic disturbances, however, are not solely of a neurological order. In his famous article, “Un trouble du souvenir sur l’Acropole” (3), Freud demonstrates a keen understanding of memory and its perturbations, though what he describes is more akin to a depersonalization syndrome. Depersonalization, however, can still be perceived as a form of partial forgetting accompanied by mnemonic distortion. It is hardly necessary to remind readers of the controversy over the use of recovered memories in psychotherapy and of the repercussions of the debate on clinical practice.

In this collection of papers, we will broach memory from a very different angle, namely, that of cognitive neuropsychology. In an excellent review of neuropsychology’s contribution to psychiatry, Keefe (4) describes the limitations of cognitive assessment and identifies 3 practical outcomes of neuropsychological research: predictive factors, diagnostic improvements, and aids for determining treatment strategies. This scientific approach, which in our opinion heralds the advent of a new branch of psychiatry (that is, cognitive neuropsychiatry), is aptly explained, with all its possible implications and impact, in the article by Dr Danion (p S5). In it, he illustrates the pertinence of cognitive neuropsychiatry through 3 concrete examples. The first of these demonstrates that drug use (in this case, benzodiazepines) is not without consequence for the components of memory. In the other 2, he explores the relationships both between memory and thought disorder in schizophrenia and between affect and depression. In our article (p S14), we will see that, in schizophrenia, virtually every component of the memory system is prone to functional impairment.

A description of memory as it is understood and conceptualized today is necessary, however, in order to provide a framework for these articles. The outline of memory function that follows is, to be sure, no more than a rough sketch that could certainly do with much refinement; nevertheless, it will serve to provide a glimpse into the complexity of this crucial cognitive system.

The notion that memory is a complex, rather than unitary, phenomenon dates back more than 100 years to the work of the American psychologist William James. He introduced the important distinction between primary and secondary memory, and although the terms themselves have long since fallen out of use, the basic dichotomy (expressed today as short- and long-term memory) has survived. The validity of the concept has been demonstrated repeatedly in the neuropsychological literature, for example, in Milner’s well-known report of a patient who, after surgical treatment for epilepsy, presented normal short-term memory but markedly deficient long-term memory (5). Such cases led in the late 1960s to a view of memory as a hierarchically arranged system in which information passes from lower to higher levels. This model came under fire, however, with the discovery of individuals in whom long-term memory was preserved in the face of severe short-term impairment. Modern theory has now abandoned the notion of a strict hierarchy, preferring instead to view memory as a system of interactive but largely autonomous components.

In the modern conception, memory is seen as comprising 3 primary systems: sensory memory, short-term memory (also known as working memory), and long-term memory. Sensory memory refers to the processing system that allows the retention, however brief, of the multitudinous stimuli that impinge upon the senses. It involves modality-specific sensory stores in which impressions of the external world are transiently encoded. Some items processed in the short-term memory may, in turn, be passed on to long-term memory for more permanent storage. Long-term memory comprises
3 subsystems of its own: semantic memory, which involves the representation of real-world objects and categories as well as language; episodic memory, which generally concerns biographical experience characterized in spatiotemporal terms; and procedural learning, which stores the motor programs underlying physical action. In his article (p S21), Dr Bédard demonstrates that neuroleptics can have differential effects on procedural learning.

Short-term memory, now more commonly referred to as working memory, is described as a system that temporarily stores visual and/or auditory information and allows it to be manipulated while the person simultaneously performs another perceptual, motor, or cognitive task. Needless to say, this type of memory plays a pivotal role in all human behaviour. Working memory is broken down into various components, any of which can prove deficient at the clinical level: the visuospatial sketchpad, the auditory input register, the phonological loop, and the central executive system. The visuospatial sketchpad is perceived as a temporary system, the purpose of which is to create, store, and manipulate mental pictures. The auditory input register contains a phonetic representation of 2 of the last 3 components listed but must call on the phonological loop if verbal items are to be stored in working memory. This loop represents the mental autorepetition that a person engages in when using subvocal language, such as repeating a telephone number in order to remember it. Finally, the central executive system is the coordinating unit, a kind of attentional system that makes it possible to run and prioritize certain components of the working memory. The key feature of the central executive system is its limited capacity to run simultaneously the different components of working memory, which may explain the decreased performance observed when subjects execute many tasks at once as compared with the same tasks executed separately. In summary, working memory represents a hub for processing new information in one’s environment and/or previous information stored in long-term memory, and it enables a person to perform a continuous action in the present with the help of previously acquired knowledge.

Long-term memory is traditionally evaluated by means of explicit memory tests that involve the conscious or deliberate recollection of previously presented information. These include free recall, cued-recall, and recognition tasks. It has been shown in the last decade or so, however, that memory can also be revealed implicitly. Implicit memory manifests itself when ease of performance is observed on tasks that do not require conscious reference to studied material. Implicit memory is at play, for instance, in stem completion tasks. In this situation, subjects are exposed to material, such as a list of words, and asked to memorize, explore, or read it. Then, after a delay ranging from a few minutes to a few months, they are asked to complete 3-letter stems with the first word that comes to mind. Implicit memory is revealed when the words previously presented come to mind more easily than any other words that may complete the stems. These 2 measures of memory are believed to reflect the functioning of independent memory systems or processes. One of the most striking pieces of evidence in favour of this hypothesis is that amnesic patients present a disturbed performance on explicit memory tests while their performance on implicit memory tests is comparable to that of normal subjects. The same has been found to be true with depression and schizophrenia. It remains to be seen whether psychosocial and drug treatments can remedy these deficits. Clearly, the door is being opened to new research possibilities that may renew clinical and therapeutic practice.

References