A considerable amount of cogni-
tive behavioral research has been con-
ducted on working memory1. Defini-
tions vary, but a theory-independent definition might state that working memory is the collection of mental processes that permit information to be held temporarily in an accessible state, in the service of some mental task. The nature of the task can vary widely and can include immediate re-
call, reading or listening comprehen-
sion, reasoning, or problem-solving. In
listening comprehension, for example, it is often the case that the intended meaning of a word within a sentence is unclear until subsequent words in the sentence are presented. It is necessary to hold words in mind in some form until their meanings can be interpreted in light of the remainder of the sen-
tence. In reasoning, assumptions and facts must be held in mind and consid-
ered together until conclusions can be deduced from them. It has been clear that the capacity of working memory is limited ever since George Miller2 de-
scribed various research studies sug-
getic that people can recall at most about seven independent, meaningful items or 'chunks' at a time.

Although limits to working mem-
ory are easily observed, it is much more difficult to determine what specific mental faculties underlie the observed limits. For example, when subjects were asked to recall and, therefore, memory should be greatly curtailed by a pattern mask im-
everal results warrant special mention and discussion.

First, the observed capacity of vis-
ual working memory was not reduced when subjects had to hold in mind two digits during a visual memory trial, to be recalled immediately afterwards11. One might expect a reduction of visual working memory if both verbal and visual representations were held in the same capacity-limited store. However, it is possible that the two verbal items could be held entirely in the form of a passive phonological store and rehearsal process without taking up space in the capacity-limited store or focus of atten-
tion12. If the verbal memory load were increased further or accompanied by a rehearsal-blocking task12, it might well be shown to reduce the observed capacity of visual working memory.

Second, the capacity limit was found to be the same (about four or fewer items) no matter whether the discrep-
ancy between displays occurred in one feature, two features, or four features of each object. Thus, the capacity is ap-
parently independent of the number and, therefore, memory should be greatly curtailed by a pattern mask im-
mediately following the first array in a trial.

For arrays larger than four it is not even absolutely clear whether subjects encode a specific feature of visual
array (either serially or in parallel) or do a partial encoding of all of the items (e.g. about half the features of each item in an eight-item array). In
other words, the basis of the four-item limit is still unclear. Various research strategies could be of use here. For example, an item-by-item analysis could theoretically reveal that it is usually the first item closest to the fixation point that are encoded. If, instead, all items are partially encoded, then it would be possible to improve performance by changing more than one feature of the target object between presentations in the same trial, increasing the chances that at least one of the critical features had been encoded by the subject.

Working memory has also been a popular topic within recent neuromaging studies. It is important to realize that there is still considerable behavioral work to be done before it will become clear what the behaviors are that might be explained through brain processes.

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