Cognitive Psychology 230Bm -- Laboratory Practical Students' Guide

Practical 2: Scanning Short-Term Memory

Short-term memory contains the information of which you are currently aware or conscious. It appears to be a limited-capacity workbench where you can think about information through a process called encoding. Saul Sternberg (1966) was interested in the process of searching the contents of short-term memory. For example, suppose you memorise a shopping list by repeating it over and over (rehearsal) and then your partner asks you if bread is on your list. To answer this question you must somehow search the items you are rehearsing in short-term memory and decide whether bread is one of the items on the list. Sternberg devised an experiment to test two questions he had about this process. His first question was whether the contents of short-term memory are searched all at once (***parallel search***) or one item at a time (a ***serial search***). His second question was whether the search stopped if you found the item in memory (called a ***self-terminating search***) or if you continued through the entire list from beginning to end (an ***exhaustive search***). Sternberg thought that if people searched through memory one item at a time (serially) then the search should take longer the more items there were in memory. On the other hand, if we can search all of short-term memory at once (in parallel), than the search should take about the same amount of time regardless of the number of items in short-term memory. Based on his own experiences he predicted that search was serial and search times would increase as the number of items held in memory increased. In his experiment, he presented a list of digits (the ***memory set***) for participants to remember and then presented a single digit (called the ***memory probe***) and asked if the probe was contained in the memory set. Sternberg varied the number of digits in the memory set and measured whether searching through larger memory sets took longer than searching smaller ones.

To answer his second question, whether we stop searching once we find the memory item we are looking for, or keep going from beginning to end (assuming it was a serial search), Sternberg included some negative probes in his experiment. Negative probes were digits that weren't in the memory set. If memory searches are self-terminating then positive probes (on average) ought to take less time then negative probes because negative probes will always require going through the entire memory set to establish that the probe wasn't in the list. If memory searches are exhaustive, however, positive and negative probes ought to have about the same search times, because in both cases you go through all of the items in the memory set.

You are about to try Sternberg's experiment. You will see a memory set of 1, 3, or 5 digits to be memorised. Once you indicate that you have memorised the digits you will see a fixation point on the computer screen (a plus sign) followed by a single digit. Your task is to report whether this digit was in the original list by pressing the left mouse button if your answer is "yes" or the right mouse button if your answer is "no". You should try to make this decision as fast and accurately as possible. You will begin with a set of 10 practice trials, and you should get at least 80% correct before going on to the full experiment. The full experiment has 180 trials and contains equal numbers of 1, 3, and 5 digit memory sets (in random order) and an equal number of positive and negative probes. At the end of the experiment, you should write down your results on the sheet provided and bring it to next week's practical for comparison with the rest of your group's data.

Additional Reading (optional)**:**

Sternberg, S. (1966). High-speed scanning in human memory. *Science*, *153*, 652-654.

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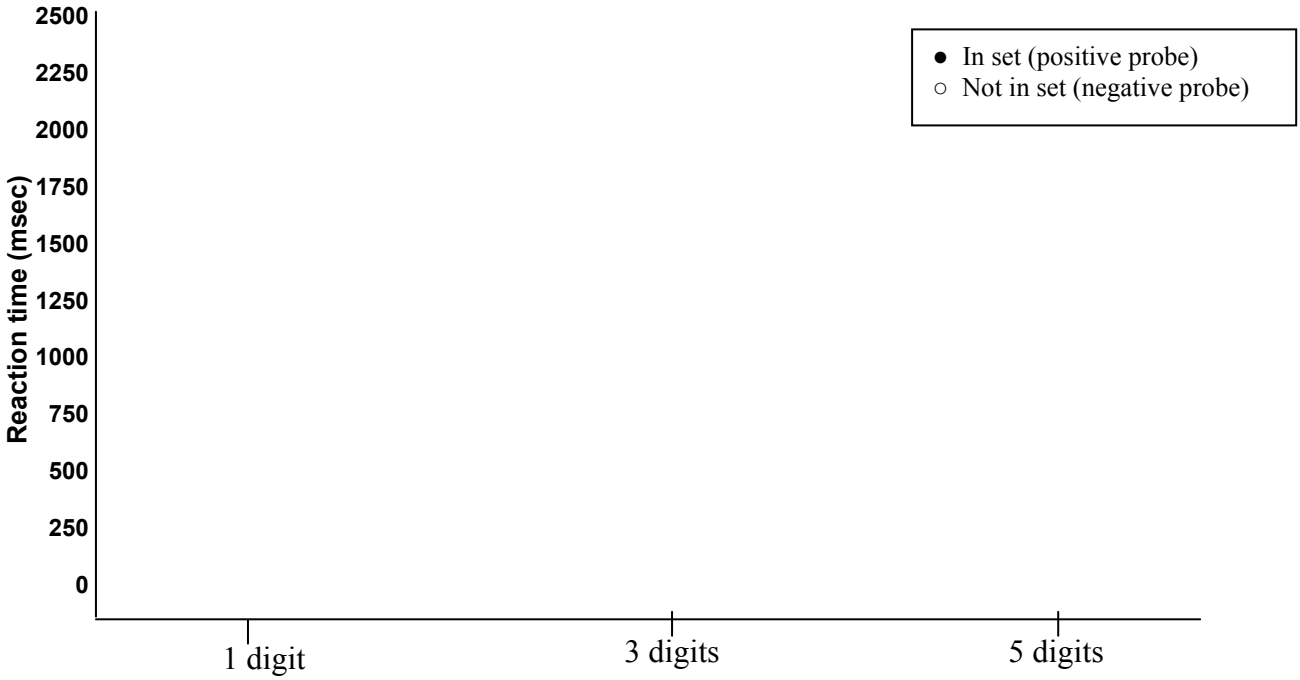
Data Sheet

Your data

Memory set size

	1 digit	3 digits	5 digits
In set			
Not in set			



Group data

Memory set size

	1 digit	3 digits	5 digits
In set			
Not in set