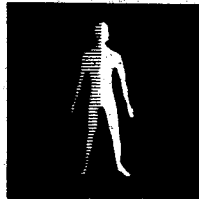


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Sperling G. The information available in brief visual presentations.
Psychological Monogr. 74:1-29, 1960.

When a subject looks at a briefly flashed array of a dozen or so letters, he typically reports seeing more letters than he can remember. This paper introduces a method of partial report to demonstrate that the subject has a very short-term visual memory of the array and to measure the decay of this memory during the half-second following the exposure. [The *Science Citation Index*® (SCI®) and the *Social Sciences Citation Index*™ (SSCI™) indicate that this paper has been cited over 455 times since 1960.]

George Sperling
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June 16, 1978

"When observers view a few rows of letters that are flashed very briefly, they enigmatically insist that they have seen more than they can remember immediately afterwards. The apparently simple question: 'What did you see?' requires the observer to report both what he remembers and what he has forgotten! To clarify this conundrum, I developed a new version of the long-forgotten method¹ of partial report. The observer is required to report only one row; at a precisely defined time after the exposure, the observer is given a randomly selected cue (e.g., a high, middle, or low frequency tone) indicating which row. When the cue occurs within a few tenths of a second after the exposure, reports are almost perfectly accurate; longer delays result in a precipitous loss of accuracy. From the accuracy of his reports, one can infer the number of letters that are *visually available* to the observer (his short-term visual memory) and the decay of

this availability with time.

"Before turning to psychology in graduate school, I had studied physical sciences. My ambition was to find ways to use the inferential methods of atomic physics to make inferences about internal mental states. For example, when an observer is asked to report all he can from a briefly viewed visual display, his report is said to define his 'span of apprehension.' Previously, this span had been regarded as an irreducible, basic characteristic of the observer. My research showed that the report that defined the span of apprehension was itself the outcome of the complex interplay of more elementary processes. Like the atom, the span had been split. Many new procedures and concepts followed. In my own follow-up work, I introduced the method of visual-noise masking to measure the rate of transfer of information from very short-term visual memory to a more durable form. I proposed short-term auditory memory as one of the longer-term repositories, and I measured the rate of subvocal rehearsal—a process that maintains information.² In the new cognitive psychology that has emerged over the last two decades, it is (as I had hoped) the style rather than the specific content of my research that has had the greatest influence.

"An interesting sidelight is that the research for the paper was carried out during the summer after I had been failed by Harvard's Department of Social Relations and therefore was not permitted to conduct the research project I originally had planned. I transferred to Harvard's Department of Psychology and did this short-term memory study as an alternative summer project."

1. Külpe O. Versuche über abstraktion. *Bericht über den ersten Kongress für experimentelle Psychologie*. Leipzig: Barth, 1904. p. 56-68.
2. Sperling G. A model for visual memory tasks. *Human Factors* 5:19-31, 1963.