

# WHOLE REPORT

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## WHOLE REPORT

**Primary Disciplinary Field(s):** Cognitive Psychology, Experimental Psychology, Sensation and Perception

### 1. Core Definition and Methodology

The **Whole Report** technique is a foundational experimental procedure utilized in the study of sensory memory, particularly **iconic memory** (visual sensory register). In this method, participants are briefly exposed to a large array of stimuli, typically letters, numbers, or symbols, presented simultaneously for a very short duration, often less than 100 milliseconds. Following the termination of the visual display, the participant is instructed to recall and report **all** of the items they observed in the array. This approach assumes that the participant's reported performance directly reflects the capacity and duration of their sensory storage system.

Unlike subsequent, more sophisticated methods, the primary characteristic of the **Whole Report** procedure is the demand for comprehensive retrieval. Participants are not guided or cued to focus on a specific subset of the information; rather, the experimental task requires the serial or simultaneous retrieval of every item encoded into memory. The results derived from this method historically established the preliminary understanding of the visual sensory buffer, highlighting its limitations when measured by the throughput of conscious verbal reporting.

The inherent limitation of the **Whole Report** technique is that it primarily measures not the capacity of the sensory store itself, but the capacity of the participant's attention and working memory to process and vocalize the rapidly fading information. The process of naming or writing down the first few items consumes valuable time, during which the remaining visual information--the icon--decays. Consequently, the observed performance often dramatically underestimates the true extent of the visually available information immediately following stimulus presentation.

### 2. Historical Context: The Birth of Iconic Memory Research

The systematic study of **iconic memory** and the limitations of the **Whole Report** procedure are inextricably linked to the groundbreaking work of experimental psychologist **George Sperling** in 1960. Prior to Sperling's research, the common psychological consensus, based largely on the consistent results obtained from **Whole Report** studies, suggested that visual sensory memory had a very limited capacity--typically only four or five items--even when arrays containing 12 or more items were presented.

Sperling used the **Whole Report** method as his initial baseline for investigation. Participants were shown a display of 12 letters arranged in three rows of four for approximately 50 milliseconds. Consistent with previous findings, participants could reliably recall an average of only 4.5 items.

This finding presented a paradox: participants often anecdotally reported feeling as though they had seen the entire array immediately after it disappeared, yet they could only report a fraction of it. Sperling posited that the information was indeed available in the sensory register, but it faded away before it could be fully transferred to a more stable memory store or verbalized.

This historical context is crucial because the **Whole Report** served as the necessary empirical failing that drove the development of the more robust **Partial Report** technique. It demonstrated that a reporting limitation--often termed **output interference**--was masking the true storage capacity of the sensory system. Thus, the **Whole Report** technique is significant not for the capacity it measured, but for revealing the inadequacy of existing methodologies to accurately gauge the fleeting capacity of the sensory buffer.

### 3. Procedure of the Whole Report Technique

The standard execution of the **Whole Report** experiment requires stringent control over stimulus presentation to ensure that visual persistence, rather than prolonged viewing, is being measured. The typical procedure involves several distinct phases, each critical to isolating the memory phenomenon under investigation.

Firstly, the apparatus, often a tachistoscope or a computer screen, is calibrated to display the stimulus array for a precise, very brief duration, typically ranging from 20 milliseconds up to 150 milliseconds. The stimulus array usually consists of 9 to 20 unrelated letters or numbers organized symmetrically (e.g., a 4x4 matrix). Secondly, the participant is positioned comfortably and instructed to focus on a central fixation point prior to the stimulus presentation. This ensures that the entire array falls within the central field of vision.

Thirdly, the array is flashed on the screen, followed almost immediately by a neutral field (a blank screen or a masking stimulus to prevent further processing). Fourthly, the critical instruction is given: the participant must verbally report, or write down, **every item** they can remember from the array. No cues or prompts are provided, demanding a complete reconstruction of the original visual field. Finally, the dependent variable measured is the total number of items correctly recalled. The consistently low score observed under the **Whole Report** condition established the baseline performance against which the breakthrough results of the **Partial Report** method were later compared.

### 4. Empirical Findings and Limitations

The enduring empirical finding associated with the **Whole Report** technique is the remarkably consistent limit on recall performance, regardless of the array size. When 12 items are presented, participants report about 4.5 items correctly; if 20 items are presented, the reported number remains statistically stable around 4 to 5 items. This stability suggested to early researchers a hard

limit on visual memory capacity.

However, the primary limitation of the technique is its susceptibility to **output interference**, or decay during the reporting stage. The rapid decay rate of iconic memory--estimated to be less than one second--means that by the time the participant has verbalized the fourth item, the memory trace for the seventh or eighth item has vanished. Thus, the reported performance is contaminated by the speed of motor or verbal reporting, failing to reflect the richness of the initial perceptual encoding.

Furthermore, the **Whole Report** method cannot differentiate between the capacity of the sensory storage and the capacity of the subsequent, more limited working memory system. Since the capacity of working memory is also typically constrained to approximately four to seven chunks, the results obtained using the **Whole Report** technique are likely confounded, simply reflecting the upper limit of the working memory system rather than the initial, high-capacity, but fleeting, sensory buffer.

## 5. Comparison to the Partial Report Method

The significance of the **Whole Report** technique is best understood when contrasted directly with Sperling's innovative **Partial Report** method. The **Partial Report** technique was devised specifically to overcome the reporting bottleneck inherent in the whole report procedure, thereby providing an accurate measure of iconic capacity.

In the **Partial Report** method, the participant is shown the same large array, but immediately after the array disappears, they are presented with an auditory cue (e.g., a high, medium, or low tone) indicating which specific row of the array they must recall. Because the cue appears only after the visual stimulus has vanished, the participant must have encoded the entire visual display into iconic memory to know which row corresponds to which tone. Crucially, since the participant only has to report a small subset (e.g., four items), the time required for reporting is significantly reduced, minimizing the effects of decay.

When using the **Partial Report** technique, Sperling found that participants could accurately recall nearly 100% of the cued items, regardless of which row was cued. By extrapolating this performance to the entire array (multiplying the reported number by the number of rows), Sperling demonstrated that participants had access to 9 to 12 items, proving that the actual capacity of **iconic memory** was much higher than the 4 to 5 items revealed by the **Whole Report** method. The contrast between these two techniques definitively established the difference between perception and memory readout.

## 6. Implications for Iconic Memory Capacity

The data collected using the **Whole Report** technique initially led to a critical misinterpretation regarding the limits of human sensory perception. The consistent low scores suggested a severe restriction on the amount of information the visual system could absorb in a single glance. However, once the confounding variable of output interference was recognized and managed through the **Partial Report** method, the implications of the **Whole Report** findings changed entirely.

The low performance in the **Whole Report** condition is now understood to be compelling evidence for the rapid decay rate of the icon. It implies that while the sensory system can register a vast amount of visual information (high capacity), this information is volatile and decays extremely quickly (short duration). The inability to retrieve all items before the trace vanishes is the critical feature demonstrated by the **Whole Report** procedure, not a failure of initial perception.

The existence of a high-capacity, short-duration sensory register, confirmed by the disparity between **Whole Report** and **Partial Report** scores, became a cornerstone of multi-store models of memory, such as the **Atkinson-Shiffrin Model**. The **Whole Report** method, therefore, served as the essential experimental tool that defined the operational limits of conscious reporting versus underlying perceptual storage.

## 7. Modern Applications and Legacy

Although the **Partial Report** technique is generally preferred for its more accurate estimation of iconic memory capacity, the **Whole Report** method retains significant historical and methodological value. It continues to be used in introductory psychological experiments to teach students about the limitations of serial reporting and to provide a foundational demonstration of the concept of **output interference**.

In modern cognitive research, variations of the **Whole Report** procedure are still employed when studying tasks where working memory load is a specific variable of interest. When researchers wish to measure the effective transfer of information from the sensory buffer into the more stable working memory store, the requirement to recall all items serves as an excellent benchmark for measuring attention and transfer efficiency under high load conditions. The legacy of the **Whole Report** technique is that it established the benchmark performance that necessitated the development of more complex experimental controls in the field of memory research.

## Further Reading

[Iconic Memory \(Wikipedia\)](#)

[George Sperling \(Wikipedia\)](#)

Partial Report Technique (Wikipedia)

Output Interference (Wikipedia)

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