

## PSI 428

### Attentional Processes

Divided Attention

### Learning Objectives

- What is divided attention
- Serial vs. Parallel Processing
- Taking in Information from Brief Visual Displays
- **Simultaneous vs. Sequential Presentations**
- Article Presentation
- Speeded Visual Search
- Article Presentation

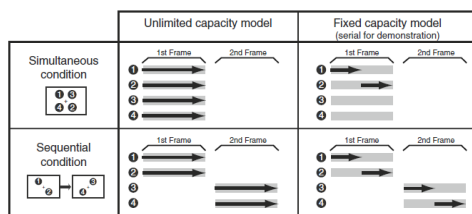
### Simultaneous vs. Sequential Presentations

- The number of elements in each display is held constant
- The time at each item was presented varied.

### Simultaneous vs. Sequential Presentations

- If visual processing capacity is limited
  - When all items are presented at the same time, subjects should be less accurate compared to
  - when some items are processed at different times

### Simultaneous vs. Sequential Presentations



Shiffrin, R. M., & Gardner, G. T. (1972). Visual processing capacity and attentional control. *Journal of experimental psychology*, 93(1), 72.

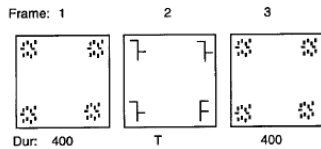
### Simultaneous vs. Sequential Presentations

- **Method:**
  - Participants decided whether the display consisted of the letters F or T
  - Distractor and target stimuli were presented either simultaneously or sequentially

Shiffrin, R. M., & Gardner, G. T. (1972). Visual processing capacity and attentional control. *Journal of experimental psychology*, 93(1), 72.

## Simultaneous vs. Sequential Presentations

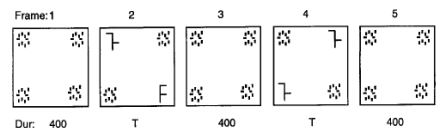
### Simultaneous Condition



Shiffrin, R. M., & Gardner, G. T. (1972). Visual processing capacity and attentional control. *Journal of experimental psychology*, 93(1), 72.

## Simultaneous vs. Sequential Presentations

### Successive Condition



Shiffrin, R. M., & Gardner, G. T. (1972). Visual processing capacity and attentional control. *Journal of experimental psychology*, 93(1), 72.

## Simultaneous vs. Sequential Presentations

- **Method:**
  - Participants practiced the task for one day
  - Then they were tested in three sessions
- **Results:**
  - Performance in simultaneous and sequential presentations were similar
- Do these results support serial or parallel processing of the visual information?

## Simultaneous vs. Sequential Presentations

- Discrimination between two possible targets were carried out in parallel and without capacity limitations.
- What is the obvious research question to investigate?

Fisher, D. L. (1984). Central capacity limits in consistent mapping, visual search tasks: Four channels or more?. *Cognitive Psychology*, 16(4), 449-484.

## Simultaneous vs. Sequential Presentations

- **Method:** Detect the target "5" in large displays of 160 characters and masks
- In the simultaneous condition there were eight characters per frame
- In the sequential condition there were four characters per frame
- Frame durations ranged from 40 ms to 200 ms

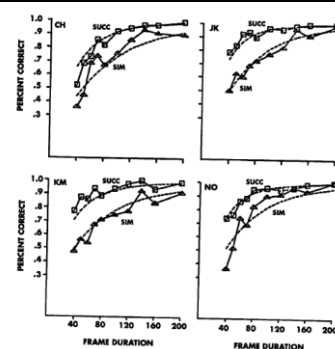


Figure 3.5  
Performance of four subjects in Fisher's overload-simultaneous (SIM) and overload-successive (SUCC) conditions. Reprinted with permission from Fisher (1984, figure 3, p. 457).

### Simultaneous vs. Sequential Presentations

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- When a small number of characters are searched detection performance was similar with simultaneous and sequential presentation conditions
- No capacity limit for easy discriminations

### Simultaneous vs. Sequential Presentations

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- When the difficulty of discriminations increased the advantage of sequential presentation was observed
- When the word stimuli was used the advantage of sequential presentation was obvious

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