PSI 428
Attentional Processes

Selective Attention

Learning Objectives

- What is selective attention
- Selective Attention in Audition
- **Selective Attention in Vision**
- Article Presentation
- Indirect measures of selective attention
- Article Presentation

Selective Attention

- **Selective attention:** «The process of selecting stimuli among many potentially available stimuli.»
- Important questions?
  - What factors make selection more or less easy / efficient?
  - What is the fate of unattended stimuli

Selection in Vision

- In vision, change in attention is not equivalent to moving eyes.
- We can select stimulis without moving our eyes.

Selective Attention

- Any selectivity of processing must rely on central rather than peripheral or mechanical processes."
- The observed performance differences must only be due to selective attention, and sensory differences, unrelated to attention should not lead a difference in performance.
- How to measure visual selection by giving equating fixation between attended and unattended channel.

Neisser, U. & Becklen, R. (1975). "Selective looking: Attention to visually specified event". *Cognitive Psychology, 7* (5): 480–494.

Neisser and Becklen (1975)

- **The Selective Looking Paradigm**

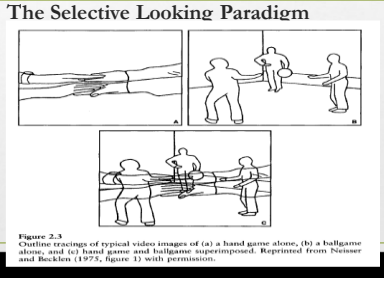

Figure 2.3
Outline tracings of typical video images of (a) a hand game alone, (b) a ballgame alone, and (c) hand game and ballgame superimposed. Reprinted from Neisser and Becklen (1975, figure 1) with permission.

Neisser and Becklen (1975)

- **The Selective Looking Paradigm**
- **Method:** Participants watched overlapping video frames from two distinct films. The images appeared at the same distance and at the same visual field.
- Participants were instructed to detect a particular event in the video (e.g. a ball being thrown)

Neisser and Becklen (1975)

- **Results:** Participants monitored which ever video image with minimal interference from the other
- They were extremely poor at monitoring both scenes.
- **Conclusion**: These results were similar to those observed with auditory stimuli.

Simons, D. J., & Chabris, C. F. (1999). Gorillas in our midst: Sustained inattentional blindness for dynamic events. *Perception*, *28*(9), 1059-1074.

Simons and Chabris (1999)

- **Inattentional blindness in vision (as opposed to inattentional deafness in audition)**
- **Method:** Participants watched a video in which two basketball teams (white and black) are passing balls within the teams.

Gorillas in our midst 1067

Transparent/Umbrella Woman

Transparent/Gorilla

Opaque/Umbrella Woman

Opaque/Gorilla

Figure 2. Single frames from each of the display tapes used here. (These tapes and that referred to in

Simons and Chabris (1999)

- **Method:** Participants were instructed to
- the total number of passes made by the attended team (the Easy condition)
- separate silent mental counts of the number of bounce passes and aerial passes made by the attended team (the Hard condition).

Simons and Chabris (1999)

- **Method:** Half of the participants attended to the white team and the other half to the black team

Simons and Chabris (1999)

- **Method:** At the end of the video, participants were immediately asked to write down their count(s) on paper.
- They were then asked to
  - Did you notice anything unusual on the video?
  - Did you notice anything other than the six players?
  - Did you see anyone else (besides the six players) appear on the video?
  - Did you see a gorilla [woman carrying an umbrella] walk across the screen?

Simons and Chabris (1999)

- **Results:**

Table 1. Percentage of subjects noticing the unexpected event in each condition. Each row corresponds to one of the four video display types. Columns are grouped by monitoring task and attended team (White or Black). In the Easy task, subjects counted the total number of passes made by the attended team. In the Hard task, subjects maintained separate simultaneous counts of the aerial and bounce passes made by the attended team.

	Easy task		Hard task	
	White team	Black team	White team	Black team
Transparent				
Umbrella Woman	58	92	33	42
Gorilla	8	67	8	25
Opaque				
Umbrella Woman	100	58	83	58
Gorilla	42	83	50	58

Simons and Chabris (1999)

- **Results**: "Around half of observers fail to notice an ongoing and highly salient but unexpected event while they are engaged in a primary monitoring task"
- "This sustained inattentional blindness occurs more frequently if the display is transparent… but observers often miss even fully visible objects appearing in live-action opaque displays."

Simons and Chabris (1999)

- **Results**: "The level of inattentional blindness depends on the difficulty of the primary task"
- "Observers are more likely to notice unexpected events if these events are visually similar to the events they are paying attention to."
- "Objects can pass through the spatial extent of attentional focus (and the fovea) and still not be **'seen'** if they are not specifically being attended."

Simons and Chabris (1999)

- **Conclusion:** Visual and auditory systems might be working with similar principles in the selection of information

Simons and Chabris (1999)

- These results support early or late selection theories?
- What are the differences between selective listening and selective looking experiments?