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

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Selective Attention

- **Selective attention:** «The process of selecting stimuli among many potentially available stimuli.»

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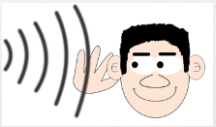
- **Selective attention:** «The process of selecting stimuli among many potentially available stimuli.»
- Important questions?
  - What factors make selection more or less easy / efficient?
  - What is the fate of unattended stimuli

Selection in Audition

- Audition is an appropriate medium for investigating the selection of perceptual information.
- "With auditory stimuli any selectivity of processing must rely on attentional processes."

Selection in Audition



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.

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Shadowing Task

Ephron writes short, intense chapters, yet allows room for emotions and imagination to expand fully. She maintains interest …

Rosemary Fell, privileged and accustomed to having all that she wants, is set to marry Philip Alsop. Of the same social class…

Rosemary Fell, privileged and accustomed to having all that she wants….

Cherry, E. Colin (1953). "Some Experiments on the Recognition of Speech, with One and with Two Ears". *The Journal of the Acoustical Society of America 25* (5): 975–79. doi:10.1121/1.1907229. ISSN 0001-4966.

Cherry (1953)

- **Method**: Two auditory messages were presented into two different ears. Participants were instructed to shadow one message.
- The rejected message was
  - a) changed from English to German,
  - b) in the middle it was played from backwards,
  - c) the speaker switch gender (and pitch)
  - d) the speech was replaced with a 400-Hz tone.

Cherry(1953)

- **Results**: Subjects finished the task easily.
- They remember nothing about the unattended message.
- They did not notice a change in conditions a and b,
- but they noticed the change in conditions c and d.

Cherry(1953)

- **Conclusion**: Certain perceptual properties of the rejected message are identified, but detailed aspects, language, words, semantic content were not noticed.
- These results support early or late selection theories?

Treisman, A. (1964). "Verbal cues, language and meaning in selective attention." American *Journal of Psychology, 77*, 206-219.

Treisman (1964)

- **Method**: Two auditory messages were presented into two different ears. Participants were instructed to shadow one message.
- The rejected message was
  - a) in the same voice
  - b) in different voices

Treisman (1964)

- **Results**: When relevant and irrelevant messages were in different voices, shadowing was done with %75 accuracy.
- When they were spoken by the same voice the accuracy was dropped to 31%
- **Conclusion:** People can filter messages effectively on the basis of frequency differences.

General Conclusions

- Both location and frequency cues facilitate selection.
- These attributes are analyzed by the system regardless of the massage was attended or not.
- This preliminary analysis is used to define channels for the subsequent selection.
- Subjects notice changes occurring in these psychophysical dimensions.

Neville, M. (1959). "Attention in dichotic listening: Affective cues and the influence of instructions." *Quarterly journal of experimental psychology, 11*, 56-60.

Neville (1959)

- **Method:** Subjects were required to shadow ten short passages of light fiction.

TABLE II

Passage	*Instructions at start of passage*	*Instructions within passage*
I	Listen to your right ear	All right, you may stop now.
II	" " " "	No instructions.
III	" " " "	John Smith, you may stop now.
IV	" " " "	No instructions.
V	" " " "	Change to your other ear.
VI	" " " "	No instruction.
VII	" " " "	John Smith, change to your other ear.
VIII	Listen to your right ear: you will receive instructions to change ears.	Change to your other ear.
IX	Listen to your right ear.	No instructions.
X	Listen to your right ear: you will receive instructions to change ears.	John Smith, change to your other ear.

Neville (1959)

- **Results:**

TABLE III

RELATIVE FREQUENCIES OF HEARING OF AFFECTIVE AND NON-AFFECTIVE INSTRUCTIONS WHEN PRESENTED IN THE REJECTED MESSAGE

	Affective (instructions preceded by by name)	*Non-affective (instructions not preceded by name)*
Number of times presented	39	36
Number of times heard	20	4

(pooled data for 12 subjects)

Neville (1959)

- **Conclusion**: "Important" messages, such as a person's own name, can penetrate the filter.
- These results support early or late selection theories?
- These results are often cited as evidences supporting the late selection theory.

Neville (1959)

- **Other Explanations**
- **Early selection theory**: Subjects occasionally relax their selectivity, and sample the rejected channel.
- The filters lapse from time to time, for some reason. It may be a strategy, curiosity or lack of selection capacity.

Neville (1959)

- **Other Explanations**
- **Attenunation theory:** The stimuli were perceptually primed. The detection can occur even that it was attenuated.
- In Neville's study participants own name was perceptually primed.

Treisman, A. (1960). "Contextual cues in selective listening". *The quarterly journal of experimental psychology, 12,* 242=268.

Treisman (1960)

- **Method**: Two auditory messages were presented into two different ears. Participants were instructed to shadow one message. Two messages were switched in the middle of the experiment.
- The rejected message was
  - a) in the same voice,
  - b) in different voices

Treisman (1960)

- **Results:** When the voice was same participants did not notice the switch and they continued to shadow the wrong channel for certain amount of time.
- When the voice was different, they noticed the change and they did not shadow the wrong channel.
- Subjects rarely noticed anything funny had happened.

Treisman (1960)

- **Conclusion:** The selection of a specific channel based on location might fail especially when the shadowed message was meaningful.
- These results support early or late selection theories?
- These results are often cited as evidences supporting the late selection theory. However, other theories could also explain it.

Neville (1959) and Treisman (1960)

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Neville (1959)

- **Other Explanations**
- **Attenunation theory:** The stimuli were perceptually primed. The detection can occur even that it was attenuated.
- In Neville's study participants own name was perceptually primed.
- In Treisman's study the meaning of the sentence primed (by expectation) the incoming words

Treisman (1960)

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Neville (1959)

- **Other Explanations**
- **Attenunation theory:** The stimuli were perceptually primed. The detection can occur even that it was attenuated.
- The meaning of the sentence primed (by expectation) the incoming words therefore they passed the filter