

## More on Perceptual Attention

- Location of Attentional Limits
- Repetition blindness and the attentional blink.

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## A situation

- You are sitting in class listening to a lecture
- Two people behind you are talking
  - How do you manage to attend to the lecture, but not to the conversation?
- One of them mentions the name of your best friend
  - Suddenly, you start to attend to the conversation
  - How did you even know they mentioned your friend if you were not attending to the conversation in the first place?
- We have already seen limits in dichotic listening
  - Where do they occur?

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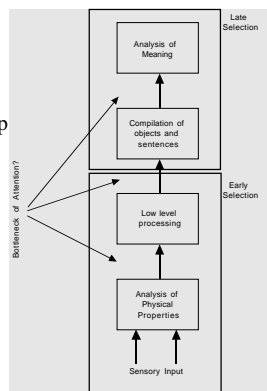
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## Bottleneck models

- Capacity is limited after some point
  - Information is processed up to that point.



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## Early and late selection

- Early selection
  - Very little stimulus information processed before selection
    - Voice characteristics, spatial location
- Late selection
  - Quite a bit of stimulus information processed
    - Basic message
- In practice, it is hard to tell these apart
  - Useful for generating research

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## Attenuation model

- Treisman (again...)
  - Physical properties of message always analyzed
  - Some high priority items processed
    - Your name or a baby's cry
  - Some situational priorities
    - Listening for the phone when expecting a call
  - Meaning is processed for those items that pass the filter.

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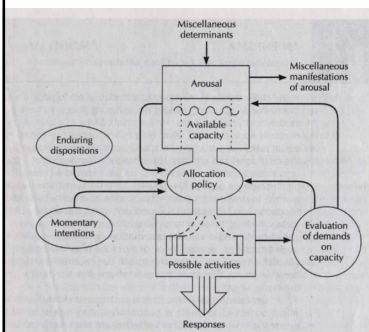
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## Resource model



- This priority system is getting complicated.
- Resource models take a different approach.

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## Additions to resource model

- Multiple resource models
  - There may be different resource pools
  - E.g., Visual processing; auditory processing.
- Patterns of *dual task interference*
  - Not all tasks interfere with each other equally
  - Listening for a tone interferes with speech perception more than with visual search.

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## Feature Integration Theory

- If information about different properties of objects are processed in different areas, then how do we know what properties an object has?
- Feature Integration Theory (Treisman)
  - Attention is required to bind together properties at locations in visual space
  - Objects and the brain
    - The *what* system
    - The *where* system

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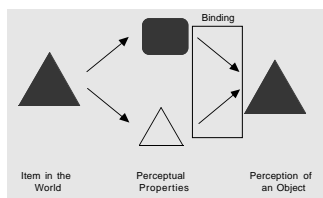
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## Feature Integration Theory



- Suggests there could be illusory conjunctions
  - Snyder
    - People see displays with colored letters
    - May report a letter with the color of a neighboring letter

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## Summary

- Bottleneck models
  - Early selection
  - Late selection
  - Dichotic listening studies often used
- Resource theories
  - There may also be multiple resources.
  - Dual task interference may be explored.
- Feature Integration Theory
  - Attention may be required to bind features together into objects

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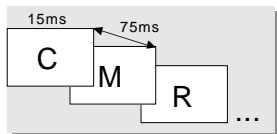
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## RSVP: Some odd findings

- RSVP
  - Rapid Serial Visual Presentation



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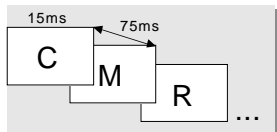
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## The attentional blink

- Search for a target, then find a probe
- If the probe is between 100ms and 450ms after the probe, people do not see it.
  - 2nd and 6th letter following the probe
- It is as if there is a blink in attention.



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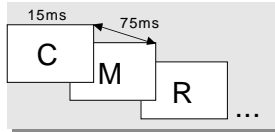
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## Repetition blindness

- RSVP in which an item is repeated
  - People must figure out which item is repeated
- They often have difficulty detecting the repeated item.



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## Why?

- Repetition blindness may reflect the *type/token* distinction
  - Types: A class of items
  - Token: A particular instance
- Repetition blindness may involve recognizing a type occurred without coding it as a separate token.



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## Perceptual attention

- What types of attention are there in perception?
- Selective attention for objects, stimuli, dimensions, and locations
  - Bottleneck and resource theories
- Attention to objects in space
  - Allows integration of features into objects
- Next class we focus on attention in high-level tasks.

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