

# HSP - lecture 7 notes - Attention

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# 1 Pre-lecture

Preparation: Read chapter 9

- **Why is attention needed? Are there different kinds of attention?**  
*Selective attention; divided and focused.*
  - *Filter theory of attention*  
*E.g. Dichotic listening method.*
  - *Bottom-up & top-down attentional control.*
  - *Value-driven attentional control.*
- **What is the cocktail party problem and what does it illustrate?**  
*Demonstrates the dependence of awareness and comprehension on attention, e.g. One phenomenon termed **inattention blindness**; the failure to perceive a fully visible but unattended visual object. When tasked to focus on one object, the participant can fail to see anything else*
- **What is the difference between inattention blindness and change blindness?**  
*Change blindness; inability to quickly detect changes in a complex scene. Quickly detecting changes in a complex scene vs Failure to perceive a fully visible but unattended visual object.*
- **What is meant by attentional cuing?**  
*Expecting a stimuli, e.g. arrows / sounds indicating something that requires attention.*
- **What makes a visual search easy or hard?**  
*Feature-based attention, e.g. finding a yellow pen on a desk is usually quite easy because it stands out; Feature search, conjunction search.*
- **What is the difference between top-down and bottom-up attentional control?**  
*Top down is voluntary control, whereas bottom-up is stimuli driven.*
- **Is it responsible to drive and talk in a mobile phone?**  
*Define responsible, but no*

## 2 Lecture

### 2.1 Attention

Attention can be modeled; imagine our attention being a spotlight, focusing on information separately but quickly, this is not always true though.

**Sofias list:**

- Internal attention (World vs own line of thoughts)
- External attention
- Selective attention (Processing a subset of available stimuli)
- Overt attention (Directing sensory organ to a stimulus)
- Covert attention
- Divided attention (Being aware of multiple stimuli)
- Supervisory control  
Can be driving.

## 2.2 Stimuli

Functional components of attention. **Salient stimuli** bottom-up stimuli.

**Top-down modulation;** can improve signal to noise ratio for the relevant stimuli.

**Working memory;** identifies the target to focus on.

**Competitive selection;** Helps to eliminate the effect of the distracting stimuli.

## 2.3 Cueing paradigm, Posner's

There's Endogenous cues(Top-down) and Exogenous cues (Bottom-up);

## 2.4 Visual search tasks

Difficult when e.g. Don't know the packaging or colour or name of a product in a supermarket. Easy when looking for a yellow car in a parking-lot.

- Looking for a target in a display containing distracting elements
- Examples: Finding your car in a parking lot or a friend in a crowd
- Target: The goal of a visual search
- Distractor: In visual search, any stimulus other than the target
- Set size: The number of items in a visual search display

### 2.4.1 Conjunction search

- A search for a target defined by the presence of two or more attributes
- No single feature defines the target
- Defined by the co-occurrence of two or more features

Illusory conjunction Mixing multiple features of an element to a new element not previously present.

## 2.5 Dunno

Local approach → Localizing an individual objects in a scene. Global approach → Identify an entire scene at once. Attentional blink; "ATTENTIONAL UN-AWARENESS", refers to how we may be unaware of stimuli in an attended location, if the stimuli occur when we are processing something else.

## 3 Knowledge

- Give examples of different kinds of attention.  
*Selective attention*
- Discuss the role of attention.  
*The filter, can't process everything all the time*
- Discuss what make a visual search easy or hard.  
*Yellow car vs looking for product in supermarket with unknown packaging and name.*
- Give examples of what can capture and elude our attention.  
*Salient stimuli, (bottom-up),*
- Give examples of how knowledge of attention can/should be used in the design of digital media.  
*use brain*

## 4 Important notes

Bottom-up; Stimulus driven.

Top-down; Voluntary.

4 times higher probability of missing something while talking on the phone while driving.