Attention

- taking possession by the mind, in clear and vivid form, of one out of what seem several, simultaneously possible objects or trains of thought
- Processing recourses

Selective Attention

- focus our attention on one or a few tasks or events rather than many
- paying attention involves selecting relevant information and ignoring irrelevant information
  Key elements in theoretical approaches concern:
- When selection takes place – how much processing do we do on information before we say that attention actually selects that information
- The fate of the information selected to process
- What actually happens to that information we do not select for processing

Dichotic listening task

- Different messages are displaying in two different earphones (one for left, one for right) – ask to repeat one of the messages
- Once the person pay attention to one ear:
  - Cannot notice the occurence of most words in the unattended messages
  - Did not notice the language switch
  - cannot recall the content of the unattended message or the language in which it was spoken

Filter Theory

- **Early selection model**
  - Attentional selection operates before observer knows what the information is

  - Based on only physical characteristics, like where the information is coming from, its pitch, volume, colour, brightness
  - Selection occurs before semantics is processed from item

Broadbent's argument

- unselected, unattented message is not being processed
- The attention filter is set to make a selection of what message to process early
- it should not be possible to recall any of the meaning of an unattended message

Problems for Broadbent's argument

- Cocktail party effect: people sometimes do hear their own name in an unattended message or conversation and hearing their name will cause them to switch their attention to the previously unattended message

The Attenuation Theory – Leaky filter model – Treisman

- Information could leak through the filter and be processed if that information has some kind of special value to us
- people process only as much as is necessary to separate the attended from the unattended message

Corteen and Wood

- attentional shift to the unattented message was unintentional and completed without awareness
- Indicates that these items were processed to the level of semantics
- suggesting that perhaps all information in the unattended channel is processed all the way to the level of meaning, even if the observer never becomes aware of that
- Participants who noticed the backward speech led to poorer performance on the main shadowing task

Deutsch-Norman's Late Selection Model

- all information – whether we are trying to attend to it or not – is processed until the point at which we can access its meaning in long term memory
- Selective attention then operates at this late stage in order to direct our awareness or to guide our response to that information
- even if we are not aware of information, it is possible that we have processed it and have actually activated its representation in memory and influence our behaviour

Daniel Kahneman

- people have some control over where they direct their mental resources, however, they can often choose what to focus on and where to allocate their attentional resources
- one effect of being aroused is that more cognitive resources are available to devote to various tasks.
- predict that we pay more attention to things we are interested in
- data limited: it depends entirely on the quality of the incoming data, not on mental effort or concentration

Automaticity and Practice

- With practice, a behaviour becomes more automatic as it requires fewer attentional resources to perform
- Automatic behaviour can become so automatic that we simply cannot prevent it from happening

Stroop Effect

- The idea of an automatized process actually interfering with behaviour will be introduced by way of an experiment
- Reading is such an automatic process in expert readers that one cannot prevent it, even when its effects are deleterious on what we intend to do – Stroop interference
- Beginning readers and readers learning a brand new language are not performing an automatic behavior – for beginner readers: reading is still a controlled process

- Interference occurs when oen is asked to report what color the letters of a word are shown in, and the word does not match the color of the letters.
- Interference occurs because everyone has different degree to which reading has become an automatic process for us.

Theoretical characteristics of Controlled vs Automatic Behavior
Controlled Processing

- Serial
- Requires attention
- Capacity limited
- Under conscious control

Automatic Processing

- Without intention
- No conscious awareness
- No interference with other mental activities
- Parallel
- Does not constrain capacity limitations

Attention Disorder

- One class of brain trauma that often leads to a disorder in attention is stroke

Visual neglect The most common attentional disorder is known as visual neglect – also known as hemispatial neglect or unilateral neglect

- visual neglect is associated with lesions in the parietal area of the right hemisphere.
- RH parietal lesions
- the patient neglects contralateral hemi-space

- may also neglect contralateral side of the body
- Attentional deficit rather than sensory
- RH parietal lesion will neglect the left visual hemi-space

Line Bisection Task

- normal: cut the line in the middle
- too far to the right → failure to attend to the left part of the line when judging its length

Drawing

- patients are drawing the right part in details but leave the left part blank
- it is not the case that the patent cannot see what is there, the processes that support vision are intact. → they simply does not pay attention to it.
- Unilateral neglect affects all aspects of the individual's life, even things as important as eating and grooming

Bisiach and Luzzati

- one direction: The patient accurately described the 'right hand side of the scene' but neglected all the buildings on the left
- another direction: The patient accurately described the right hand side of the scene but neglected all the buildings on the left
- they described buildings they have previously neglected to report.
- Clearly, all the information was present in memory and had not been simply forgotten. The patients' ability to attend to the left hand side of a visual memory was clearly affected.

Brain injury can have a profound effect on our ability to attend to select information from visual and or mental space **Real World Application**

- Straynor and Johnston (single Task Condition)

  - Participants asked to keep the computer's cursor on the moving target
  - Press a button if the target turns red
  - Do nothing if the target turns green
  - Hand-free phones will not solve what is actually an attentional problem
  - a passenger likely shares joint attention with drivers and adjusts the expectations of the conversation accordingly
  - we have limitation in terms of our attentional abilities

- Dual-Task Performance
  - indicates that mistakes were made in the dual task condition than in the single task condition