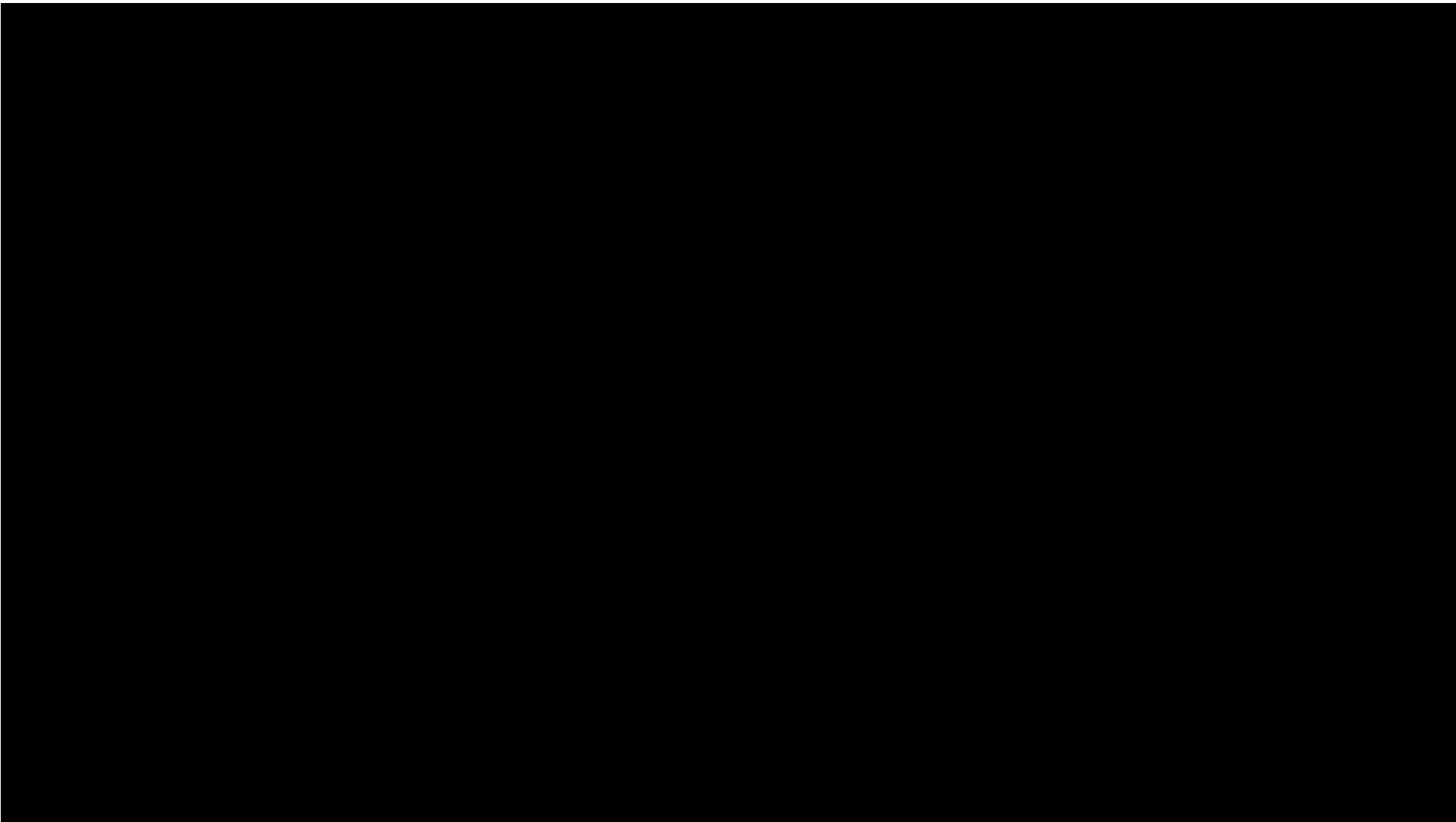




Lecture Six

Cognitive Psychology - Attention



What is 'attention'?

- How many things can you do at once?



- How do you focus on one conversation when there are many other conversations going on around you?

What is attention?

Attention is many things:

- Please 'pay attention!'
- Auditory: 'You're not listening to me!'
- Visual: 'Sorry, I didn't notice'

See Mary if had you a can
little pick lamb this its text
fleece out was from white
the as other snow words

Attention

- There are a huge number of sensations at any time in the world we move in
- Our cognitive capacities cannot ever process all of this information
- We must therefore attend to only some things in our environment and ignore the rest

Attention

Attention is seen as a **limited-capacity information-processing system**

- “Paying attention to something” typically refers to one of two things:
 - Being selective about what we concentrate on
 - The notion that we can attend to a limited amount of things at once
- This suggests that we can make things more or less conscious by focusing on them, or ignoring them
- It could be described as focusing our information processing resources on certain stimuli or actions

Exploring Attention

- Psychologists have focused on two dimensions of attention:
 - 1) **Selective or focused attention**
 - Exploring the ways in which some information is registered and other information is rejected
 - 2) **Divided attention**
 - Exploring the maximum amount of information that can be attended to at any time

Selective or Focused Attention

- **Exploring the ways in which some information is registered and other information is rejected**
- Studied by presenting two or more auditory messages at the same time; instructed to only focus on one of them
 - **Shadowing:** one message fed into left ear, one into right ear; participants repeat one message aloud as they hear it
- Provides information about how we selectively attend to certain stimuli

Cherry (1953): 'Cocktail Party Effect'

- How we pick out a single conversation among a number of others
- Two streams of speech played - one to each ear
- Participants asked to repeat the speech played in one ear, but were then asked about content of the other speech stream



Cherry (1953): 'Cocktail Party Effect' findings

- Participants might know whether the other voice was male or female
- But might not know what was said, or even what language the speaker was talking in
- May also describe a similar phenomenon - when we immediately detect words of importance originating from unattended stimuli
- Other studies agree that
 - little is remembered of attended words, regardless of times repeated or what language it was in
 - a change of voice from male to female is noticed
- Suggests that we may **hear the physical properties of a word but not its meaning** (semantic context)

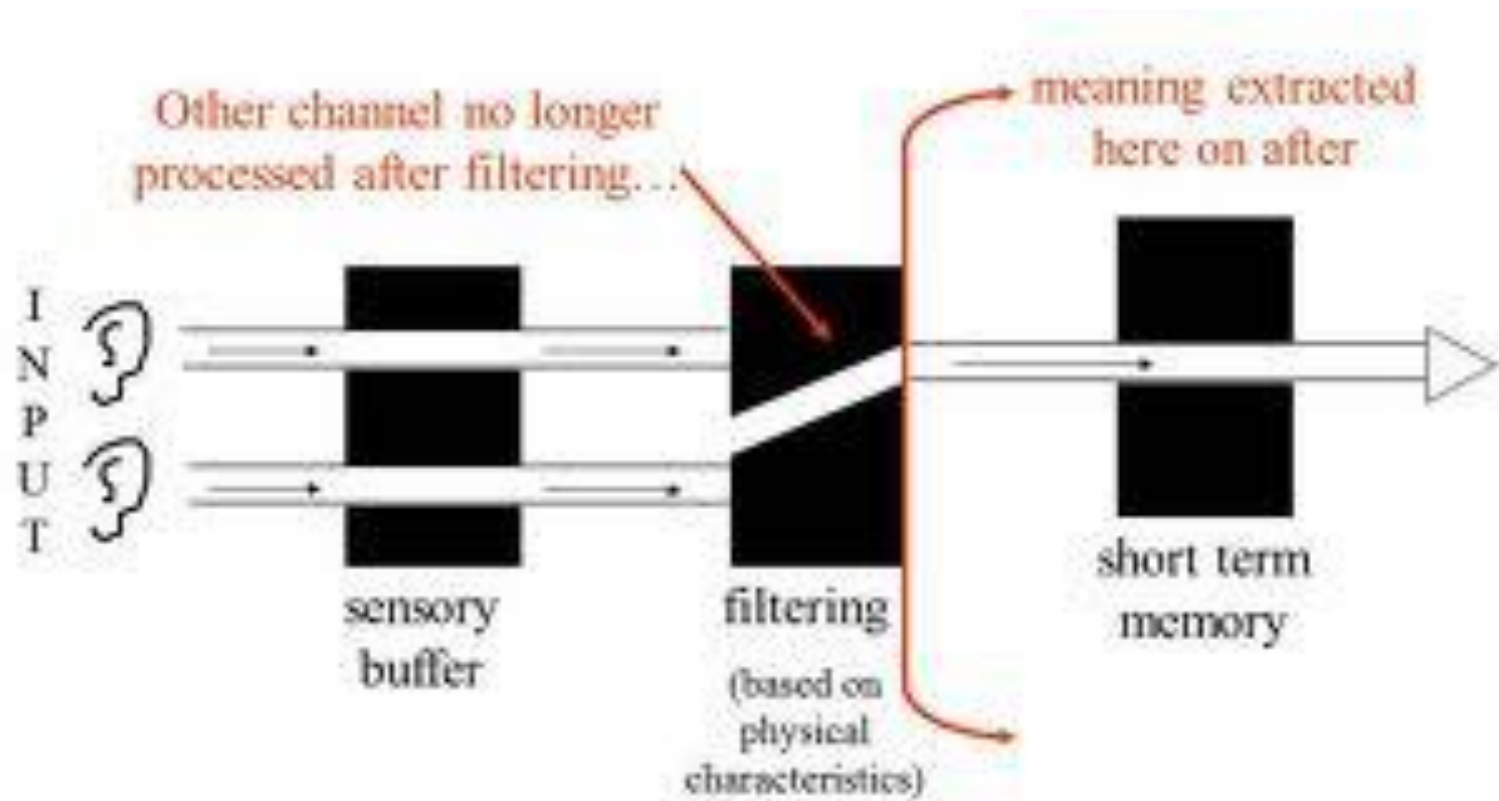
MODELS OF SELECTIVE ATTENTION:

Single channel models

- Somewhere in information-processing there is a 'bottleneck' or filter
- This allows for some information to be passed on for further analysis
- The rest is either discarded or processed to only a limited degree.
- Three theories: differ in proposals of WHEN the filtering takes place
 - Broadbent's (1958) early selection filter theory
 - Treisman's (1960, 1964) attenuation model
 - The Deutsch-Norman late selection filter theory
- Selective attention tasks have been crucial in driving the development of bottleneck models
- Involves focusing on one task and excluding irrelevant stimuli

Broadbent's (1958) Filter Model of attention

- We filter out sensory information before it reaches STM
- This filtering is based on the **physical characteristics** of the stimuli rather than any semantic content



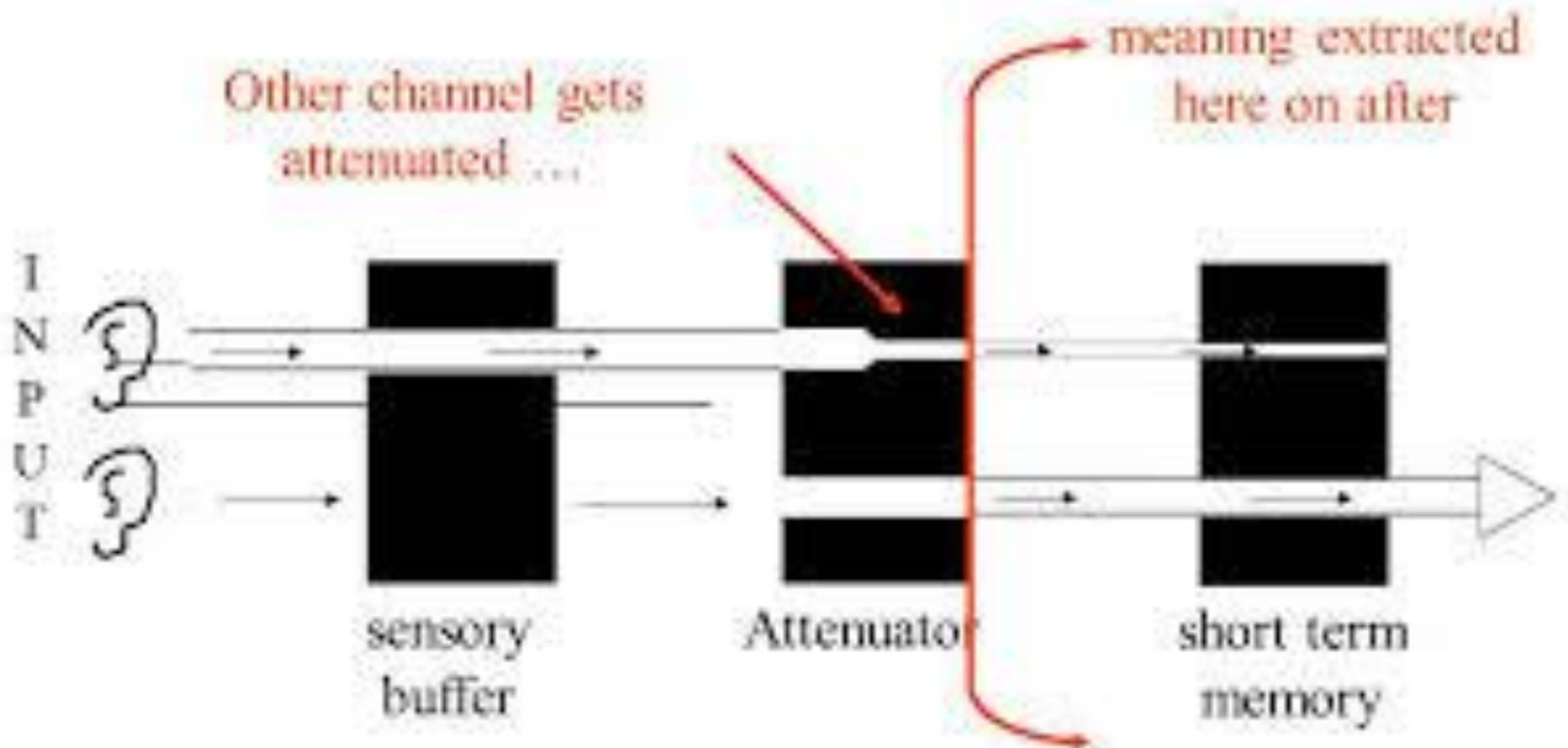
Criticism of Broadbent's Model

- Von Wright et al. (1975)
 - Paired certain words with electric shocks
 - Because of conditioning, the words caused a fear response on their own, measurable by galvanic skin response (GSR)
 - Using Cherry's technique, Von Wright found conditioned words in the ignored ear still produced GSR response, even without awareness
 - Showing that some meaning must be processed *before* awareness, and that Broadbent's model cannot be entirely correct

Treisman's Attenuator Model

- Treisman (1964) alternatively argued that instead of a strict filter, processing was **attenuated** (reduced) for the unattended stimuli
- Therefore, some processing of meaning could take place, albeit in a much reduced fashion
- This could account for why conditioned words could still cause a fear response even when 'ignored'
- But, full sentences could not be understood

Treisman's Attenuator Model



Evaluation of Treisman's Model

- Overcomes some of the problems associated with Broadbent's Filter Model – can account for the 'Cocktail Party Phenomenon'
- But - does not explain exactly how semantic analysis works
- The nature of the attenuation process is not precisely specified
- Can never be sure that the participants have not actually switched to the so called unattended channel

Deutsch-Norman Selection Model

- The previous two models are known as ‘early selection models’ because information is selected *before* it reaches awareness and STM
- Deutsch and Deutsch (1963) have argued for a ‘**late selection model**’
- This is where all information reaches STM and selection happens at this point
- Model supported by experiments that have shown that quite sophisticated semantic analysis can happen with unattended stimuli.

Evaluation of single-channel models

- The Deutsch-Norman model offers a better explanation of non-attended messages than Broadbent's or Treisman's models
- Lack of flexibility
- Can single, general purpose, limited-capacity central processor theories account for the complexities of selective attention?
 - Much of the relevant evidence comes from dual-task studies

Divided Attention

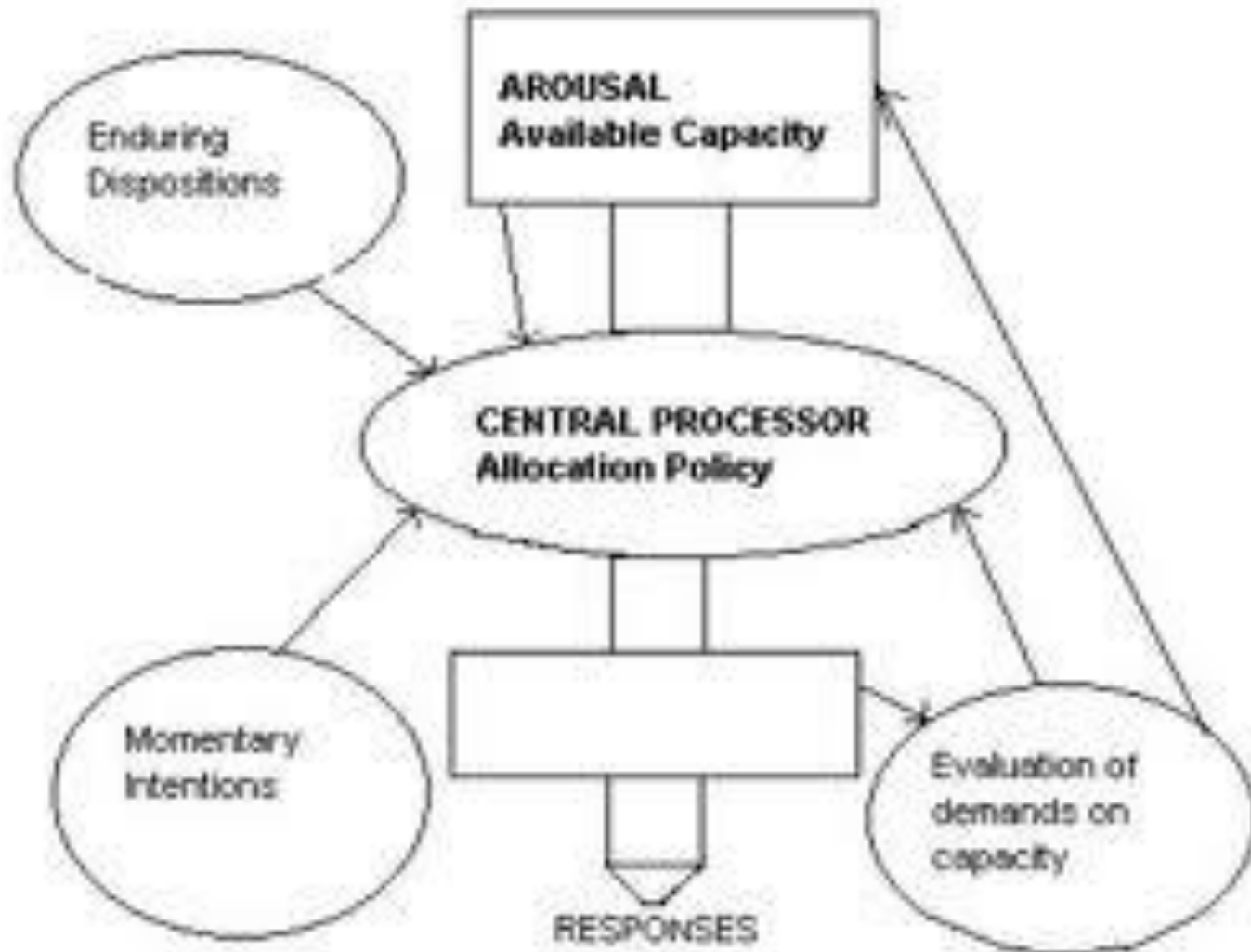
- Exploring the maximum amount of information that can be attended to at any time
- Studied through the dual-task technique: people have to attend to and respond to both messages
- Provides information about the limitations of attention and capacity
- **Models of Divided Attention:**
 - **Limited Capacity or Parallel-Processing Theories**

- Limited capacity theories (theories of divided attention) :
 - Are interested in our capacity for processing more than one stimuli at the same time
 - See attention as **parallel-processing**
- We have a limited amount of processing capacity
 - **Kahneman's (1973) theory**
- We can process information in parallel but performance worsens as capacity is reached
- Limited capacity theories argue that we only have so many attentional resources that we can use at once
- When we have 'run out' we start missing stimuli or making errors on tasks

Kahneman's (1973) Theory

- We have limited processing capacity
- Whether or not two tasks can be performed successfully depends upon whether capacity has been reached
- The difficulty of a task and the skills of the person will influence how much capacity it used
- A Central Processor is responsible for the allocation of attentional resources

Kahnman's (1973) Theory



- Is it ever possible to perform two tasks simultaneously to a high standard?
- Can you think of **anything** you do in your day-to-day life that involves dual-tasking?



Evaluation of Kahneman's theory

- Portrays attention as much more flexible and dynamic than do models of focused attention
- Still doesn't address the issue of how decisions to channel attention are made
- Multi-channel theories:
- Key reading: Gross (2010) Chapter 13: Attention

Automatic versus Controlled Processing

- If a certain task is practised enough it may become *automatic*
- If it is *automatic* then it makes no demands on the attention process
- Therefore, it is possible to perform two tasks simultaneously and efficiently

Schneider and Shiffrin's (1977) Automaticity Model

- **Distinction between controlled and automatic processing**
 - **Controlled processing** involves heavy demands on attention system and involves consciously directing attention towards a task
 - **Automatic processing** involves no demands on the attention system, is fast and has unlimited capacity. It is not subject to conscious awareness

e.g., Driving: Controlled or Automatic processing?

When does driving become an automatic process?



When we first begin learning to drive, is driving a controlled process?

Action Slips

- How many of you have:
 - Made a cup of tea and forgotten to put the tea bag in?
 - Picked up your mobile phone rather than your TV remote?
 - Put something other than toothpaste on your toothbrush?

Summary

- 'Attention' is really an umbrella term for a number of processes and abilities
- These abilities range from focusing on a single aspect at one extreme, to automatic, uncontrollable responses to other stimuli
- The idea that many processes can become automatic and make no demands on attention has some support
 - this helps explain why we sometimes perform behaviours we didn't intend



Seminars next week...

- Half way through the module – already!
- Mid-module test
 - This will help you determine your level of learning
 - Don't miss this, as you will find it useful

