

Attention and Executive Function

Executive Function Processes that control behaviour and support the pursuit of goals. The main mechanism to control perception is attention, but behaviour can help you to get in situations where you attend to things (e.g. moving round someone to see something).

Automatic Behaviours These are behaviours triggered and executed automatically by appropriated environmental stimuli (e.g. driving to work)

Attention The concentration of mental efforts. Selective processing of task-relevant stimuli. We can direct our attention toward something **endogenous** but salient stimuli can grab our attention **exogenous**.

Automatic behaviours reduce the need for control. Attending to every stimulus in the environment would require a large cognitive capacity. However, automatic behaviours can be unnecessary or inappropriate and so must be inhibited.

The Stroop Task is an example of inhibition of automatic behaviours through executive function.

The Prefrontal Cortex is responsible for executive function. Damage leads to **dysexecutive syndrome**.

A famous example of someone with dysexecutive syndrome is **Phineas Gage** – a railway worker who had an iron rod driven through one or both of his frontal lobes. It caused a radical change in his personality and social function. Symptoms include failure to inhibit actions triggered by environment (must open door), difficulty switching to new goal (Wisconsin card sort task), sequencing failures (Burgess et al. 1991, shopping trip or multiple errands test), action slips.

Cocktail Party Effect (Cherry) Cherry got participants to listen to pairs of spoken prose through headphones. He found that various physical differences affected a person's ability to attend to the voice (e.g. voice intensity). Voice shadowing studies by Cherry suggested that although shadowed voices were heard, their semantic content was not recognised. Why?

Early Selection (Broadbent, 1954) proposed that information is passed to a short term store, in which information is held until processed further. Information is preserved until they are selected by a filter, which selects one source and rejects others. Here, the filter is capacity limited.

Later Selection (Deutsch & Deutsch, 1963) argued that filtering or selection only occurs once all inputs have been analysed. All information is processed but only pertinent information is acted on.

Treisman Attenuation Model (1960) suggests that competing information is analysed for semantic as well as physical properties but that less pertinent information (non-shadowed message) is attenuated or 'turned down' by the filter. Treisman found that if meaningful information was switched ear mid-sentence, people would focus their attention on the other ear. Treisman also found that bilingual participants played the same sentence in french and english recognised that both sentences meant the same thing.

Lavie's Compromise Nili Lavie argued that both early and late selection occur. Under normal, low perceptual load circumstances, late selection occurs. But under circumstances of high perceptual load, early selection is necessary. This can be measured using visual-search tasks (targets amongst distractors). Divided attention is an unconscious process.