

3a. Consciousness - Psychological Construct & Measurements

Consciousness: The awareness of an individual's own existence and mental activities (sensations, perceptions, thoughts and feelings) and of objects and events in the external world.

- Consciousness is a psychological construct: hypothetical concepts that are created to explain phenomena that are believed to exist or occur but cannot be directly observed or measured.

Consciousness is:

- **PERSONAL** = consists of our own understanding and perceptions of our internal and external world.
- **SELECTIVE** = you pay attention to some things and ignore others
- **CONTINUOUS** = its contents are blended into one another with no specific beginning or end.
- **CHANGING** = thoughts are constantly moving from topic to topic.

A continuum of consciousness:

- Psychologists describe consciousness as varying along a continuum with two distinctive extremes:
 - Total awareness = focused awareness
 - Complete lack of awareness = unconscious in deep coma
- In a typical day we experience many different states of consciousness and therefore many different levels of awareness.

Methods used to study consciousness:

Psychological characteristics which help to differentiate between NWC and ASC:

- Level of awareness
- Content limitations
- Attention
- Controlled and Automatic Processes
- Perceptual and cognitive distortions
- Emotional Awareness
- Self-Control
- Time Orientation

Physiological characteristics which help to differentiate between NWC and ASC

- The three main devices used to study states of consciousness (measurement of physiological responses)
 - Electroencephalograph (EEG)
 - Electrooculargraph (EOG)
 - Electromyograph (EMG)
- Other techniques for measuring consciousness:
 - Cognitive tasks
 - Sleep diaries
 - Observational studies

Measuring consciousness:

We can make inferences about the states of consciousness from:

Ways of collecting information	Example
Information provided by the individual	Self Reports
Behaviour that is demonstrated	Experimental Research
Physiological changes that can be measured	Brain recordings and scanning techniques.
Observation of the individual and their behaviour	Observational studies

1. The electroencephalograph (EEG):

A device that **detects, amplifies** and **records** general patterns of **electrical activity of the brain** produced by the billions of neurons in the brain.

- Brain wave patterns in EEG recordings can vary in:
 - Frequency – the number of brain waves per second
 - Amplitude – the size of peaks and troughs from a baseline of zero activity

Frequency: The number of brain waves per second

- A high frequency brain wave has more waves per second.
- A low frequency brain wave is slower and has fewer waves per second.

Amplitude: The size of the peaks and troughs measured as the distance from the baseline of zero.

- High amplitude brainwaves have larger peaks and troughs
- Low amplitude brainwaves have smaller peaks and troughs.

Summary:

2. **Electromyograph (EMG) [Myo = muscles]:** A device that **detects, amplifies** and **records the electrical activity of muscles responsible for movement.**

3. **Electrooculargraph (EOG) [ocular = eye]:** A device that **detects, amplifies** and **records electrical activity in muscles responsible for eye movement.**

Subjective: Data collected from participants is based on their personal opinion, interpretation, point of view or judgement.

- Often biased
- Can vary from person to person

- Not always entirely accurate
 - Examples – self-reports/sleep diaries

Objective: Scores are *not* subject to personal opinion or interpretation by the researcher.

- Usually involve some form of electronic measurement
- Not vulnerable to bias
 - Examples – EEG, EMG, EOG and measurements of speed and accuracy

Measurement of speed and accuracy on cognitive tasks:

- Measurement of speed typically involves response or reaction time to a stimulus.
- Measurement of accuracy typically involves the number of correct responses
- Speed and accuracy are considered objective performance measures → their scores are not subject to personal opinion or interpretation by the researcher.

Measuring consciousness:

Sleep diaries - subjective reporting:

- A self-reported record of an individual's sleep and waking time activities.
- Usually over a period of several weeks

Video monitoring:

- Most commonly used in the study of sleep and sleep disturbances or disorders.
- Another type of subjective measurement that relies on the researchers interpretation of the observed behaviour.

