States of Consciousness

Unit 3 Psychology ~ 2013
Key Knowledge

- Concepts of Normal Waking Consciousness (NWC) and Altered States of Consciousness (ASC) including daydreaming and alcohol-induced.

- Comparison of States of Consciousness (SOC):
  - Levels of awareness: Controlled and Automatic processes
  - Content limitations
  - Perceptual and cognitive distortions
  - Emotional awareness
  - Self control
  - Time orientation

- Methods used to study the level of alertness in normal waking consciousness:
  - EEG, GSR, body temperature, heart rate.

- Research methods and ethical principals associated with the study of states of consciousness
What is CONSCIOUSNESS?

- CONSCIOUSNESS is the awareness of
  - Objects and events in the external world
  - Our own existence
  - Mental experiences at any given time
- Consciousness is described as being
  - Personal
  - Selective
  - Continuous
  - Changing
Consciousness is...

- PERSONAL
  - It is your subjective understanding of both your private internal world & the environment.

- SELECTIVE
  - You can select/choose to pay attention to certain things and to ignore others.

- CONTINUOUS
  - The contents of your consciousness blend into one another. Your consciousness is never “empty”.

- CHANGING
  - Your consciousness is never still, particularly while you are awake.
STATE OF CONSCIOUSNESS

- State of consciousness = Level of awareness
- Our brain continually receives information about our internal & external world, however the amount of information that is taken in is determined by our level of awareness.
- There are no distinct boundaries to indicate where one state of consciousness ends and another begins.
- Consciousness ranges along a continuum or scale (see next slide)
  - from total awareness → to a complete lack of awareness.
A Continuum of States of Consciousness

** TOTAL AWARENESS **
Focused attention **
Ordinary wakefulness **
Daydreaming
Meditation
Hypnosis
Sleep
Anaesthetised
Unconscious/Coma

COMPLETE LACK OF AWARENESS
Two Categories of Consciousness

- NORMAL WAKING CONSCIOUSNESS (NWC)
  - The states of consciousness when we are awake and aware of our thoughts, memories, feelings and the sensations we are experiencing from the outside world.

- ALTERED STATES OF CONSCIOUSNESS (ASC)
  - A distinctly different level of mental awareness to normal waking consciousness
  - Major changes occur in the qualities and characteristics of an individual’s thoughts, feelings & perceptions.
  - Cognitive processes or perception of your self or the world may change, and normal inhibitions or self-control may weaken.
Psychological Characteristics

- Level of attention
- Level of awareness
- Content of consciousness
- Perceptual experiences
- Cognitive abilities
- Emotional awareness
- Self control
- The experience of time
Normal Waking Consciousness

Level of Awareness

- Attention involves focusing on specific stimuli & ignoring others.
- The states of consciousness that are at the top end of the continuum require more attention.
- In normal waking consciousness, attention can be focused on either internal thoughts or feelings or on external stimuli.
- You can change the focus of your attention freely.
- The change in focus of attention can be intentional or may occur without you being aware of it.
- Focused attention is a CONTROLLED PROCESS.
SELECTIVE ATTENTION

- At any given moment the focus of our awareness is on only a LIMITED range of all that we are capable of experiencing.
- It can be either internal or external.
- Study to demonstrate selective attention carried out by Neisser & Becklen (1975) - video with the image of clapping hands superimposed over a basketball game.
- “Cocktail Party Effect” → the ability to pay attention to one person’s speech among competing conversations; your attention is attracted to a competing conversation when you hear your own name being mentioned.
- Our attention is also attracted by any CHANGES in stimulation, or the introduction of a NEW stimulus.
- Selective attention allows us to either allow information to enter into or be excluded from our consciousness.
Selective Attention Video
http://www.youtube.com/watch?v=nkn3wRyb9Bk
DIVIDED ATTENTION

- The ability to distribute your attention and manage 2 or more tasks simultaneously.
- People are able to divide their attention among competing stimuli (e.g., listening to radio & driving).
- Research findings have shown that our perceptual system can handle some divided attention tasks, as long as the tasks are not complex and therefore do not demand considerable mental effort.
- The ABILITY to divide our attention depends on how much conscious effort is required for the various tasks in which we are undertaking.
- A complex task requires selective attention and a higher level of consciousness than a familiar task.
Normal Waking Consciousness

Content Limitations

- Content is restricted and limited during normal waking consciousness.
- We are able to control what we allow into normal waking consciousness.
- The content of normal waking consciousness is generally organised & logical.
- Because a significant amount of information that enters our consciousness is within our control, we can block things which make us feel self-conscious, embarrassed, depressed, repulsed, sad, afraid, hurt etc.
Normal Waking Consciousness

**Controlled Processes**

- Required for the activities that demand high levels of concentration during normal waking consciousness.
- Involves information processing requiring conscious, alert awareness and mental effort in which the individual actively focuses their attention on achieving a particular goal.
- Controlled processing is serial → only one activity requiring controlled processes can usually be performed at a time.
- Usually require controlled processing when an activity is difficult or unfamiliar.
- Attention is focused exclusively on the task preventing attention being directed towards any other activities.
Normal Waking Consciousness

Automatic Processes

- Require little conscious awareness and mental effort, minimal attention & do not interfere with the performance of other activities.
- Require LESS conscious effort than controlled processes.
- Automatic processing is PARALLEL → we can handle two or more activities at the same time.
- Activities which require less concentration and therefore a lower level of consciousness involve automatic processes.
- Example of Automatic Processing: STROOP EFFECT, by J. Ridley Stroop (1935) → this effect occurs because when we are presented with a word, our automatic response is to read the word.
The Stroop Effect

The four conditions...

1. *words in black ink* - words are colours - read out each word
2. *words in coloured ink* - words are names of colours - read out the colour of the ink (not the actual word)
3. *coloured blocks* - name the colour of each block
4. *words in coloured ink* - words are names of everyday objects - read out the colour of the ink (not the actual word)
THE STROOP EFFECT

- What is your hypothesis?
- Equipment: stop watch, score sheet, stroop cards
- Work in pairs
- One person is the TIME KEEPER (experimenter)
- The other person reads out the words/colours (Participant)
- Time how long it takes for the participant to correctly identify each word/colour.
- Collate class results - tabulate, analyse, graph
- Was your hypothesis supported/rejected?
**CONDITION 1:** Colour words in black print

**TASK:**
“Read the word”

<table>
<thead>
<tr>
<th>Red</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
</tr>
<tr>
<td>Blue</td>
</tr>
<tr>
<td>Purple</td>
</tr>
<tr>
<td>Orange</td>
</tr>
<tr>
<td>Green</td>
</tr>
<tr>
<td>Orange</td>
</tr>
<tr>
<td>Red</td>
</tr>
</tbody>
</table>
CONDITION 2: Incongruent Colour Words

**TASK:**
“State the colour of the INK”
CONDITION 3: Blocks of colour

TASK: “State the colour of the block”
**CONDITION 4:** Familiar words in colour print

**TASK:**
“State the colour of the INK”

<table>
<thead>
<tr>
<th>truck</th>
<th>store</th>
</tr>
</thead>
<tbody>
<tr>
<td>couch</td>
<td>table</td>
</tr>
<tr>
<td>shirt</td>
<td>store</td>
</tr>
<tr>
<td>couch</td>
<td>truck</td>
</tr>
</tbody>
</table>
ALTERED STATES OF CONSCIOUSNESS

- Any state of consciousness that is distinctly different from normal waking consciousness in terms of:
  - Level of awareness & experience
  - The quality or intensity of sensations
  - Perceptions
  - Thoughts
  - Feelings
  - Memories that are experienced

- Mental processing shows distinct changes unique to the particular altered state.

- Cognitive processes or perceptions of your self or the world may change.

- Normal inhibitions or self control may weaken.
Altered State of Consciousness (ASC) may occur naturally (e.g., sleep) or may be purposely induced (through meditation, hypnosis, drugs).

Although the psychological changes that occur as a result of an ASC will vary for each individual, there are some characteristics that are common to ASC. These include:

- Perceptual & Cognitive Distortions
- Disturbed sense of time
- Changes in emotional awareness
- Changes in self-control
Altered States of Consciousness

Distortions of Perception & Cognition

- The way we experience sensations and perceptions in an ASC will be different than when in normal waking consciousness.

- Senses can either be heightened or dullled.
  - For example, experiencing hallucinations under drug-induced states

- It may be possible to lose your own sense of identity by believing you are someone else or “outside yourself”.

- Experiencing a sense of ‘losing touch with reality’.
Cognitive functions (information processing) are also distorted during an ASC.

Thoughts become disorganised.

Thinking in an illogical manner and lacking in sequence.

Difficulties in problem solving.

Difficulty remembering what occurred during an ASC.

Difficultly retrieving information stored in memory prior to the ASC, however, these memories can be accessed when returned to a state of normal waking consciousness.
Altered States of Consciousness

Disturbed Sense of Time

- Estimation of time is distorted during an ASC.
  - Time may seem to pass more slowly or more quickly
Altered States of Consciousness

Changes in Emotional Awareness

- Emotions may be experienced differently.
- Feelings may appear to be in a state of turmoil.
- People in an ASC may respond to a situation uncharacteristically.
- People may be much more emotional or may feel ‘emotionless’.
- Emotional responses may be unpredictable during an ASC, eg. Crying for no real reason when drunk.
Altered States of Consciousness

Changes in Self Control

- The ability to maintain self control can change during an ASC.
  - Eg1: Inability to control emotions when drunk; Inability to co-ordinate & control movements when drunk
  - Eg2: The use of hypnosis to help some people give up smoking, gambling, overeating, and for pain management.
Daydreaming

- Altered state of consciousness
- This is when we shift our attention from external stimuli to internal thoughts, feelings and imagined scenarios
- May occur naturally without being aware that it has happened
- More likely to occur when...
  - We are not moving
  - Alone
  - Waiting to fall asleep
  - Travelling on public transport
  - Doing boring/routine activities
Purpose of Daydreaming

- Enables us to mentally try out a range of options for responding to a particular situation
- Allows us to solve problems
- Allows us to stay mentally alert in situations where there is insufficient external stimulation
Alcohol-induced State

- Alcohol is considered to be a PSYCHOACTIVE DRUG – chemicals that alter brain function by causing changes in conscious awareness, perception or moods.

- The specific effects of alcohol on consciousness depend on a wide range of variables including:
  - Concentration of alcohol
  - Conditions under which the alcohol is consumed
  - Rate of consumption
  - Body weight
  - Age, gender
  - Physical wellbeing
Effects of Small Amounts of Alcohol

- Promotes relaxation
- Elevates mood
- Increases talkativeness
- Lowers inhibitions
- Impairs judgement
Effects of High Amounts of Alcohol

**BAC = 0.05 - 0.10**
- Brain becomes more depressed
- Thinking & concentration is slowed
- Muscular coordination is impaired

**BAC = 0.20 - 0.30**
- Strong sedative effect
- Major impairment

**BAC = 0.40 - 0.50**
- May become unconscious

**BAC ≥ 0.50**
- May cause death
Alcohol and Memory

- Heavy drinking can prevent memories from being formed causing an ‘alcoholic blackout’ → loss of memory when drinking
- KORSAKOFF’S SYNDROME (amnesia) can occur in alcoholics due to brain damage.
- Symptoms include
  - problems with selective attention
  - Limited attention maintenance leading to problems comprehending information
  - Emotional flattening (reactions are flat or non-existent)
Effects of Alcohol on Consciousness

- Shortened attention span
- Impaired perception (senses not processed correctly)
- Impaired thinking
- Impaired memory
- Slower reaction times
- Reduced self-awareness
- Impaired emotional awareness and control
- Impaired perception of time
- Less self-control
- Difficulties with voluntary muscular control and fine movements
- Less able to perform complex tasks
Methods used to study level of alertness in Normal Waking Consciousness

- Consciousness cannot be directly measured or observed and is referred to as a ‘psychological construct’
- **Psychological Construct**: a concept that is ‘constructed’ to describe specific ‘psychological’ activity that is believed to exist but cannot be directly observed.
- Inferences are made from information that is provided by the individual, behaviour that is demonstrated or from physiological changes that can be measured.
- Psychologists focus on physiological measures as they are objective and less prone to bias.
Measuring Physiological Responses

- States of consciousness cannot be observed or measured directly.
- Various devices exist that are used to measure the physiological responses during the various states of consciousness.
- Different patterns of physiological responses indicate different states of consciousness.
Physiological Responses

- Different states of consciousness will show variations in:
  - Electrical activity of the brain
  - Heart rate
  - Body temperature
  - Galvanic Skin Response/Electrical conductivity of the skin
    (i.e., levels of perspiration)
Electrical Activity of the Brain

- Brain wave patterns are measured using EEG recordings.
- Brain waves can differ in:
  - **Frequency** - the number of brain waves per second
  - **Amplitude** - the intensity of the brain waves; judged by the size of the peaks & troughs of the pattern of brain waves.
- There are 4 different brain wave categories with different combinations of frequencies & amplitudes.
  - BETA waves
  - ALPHA waves
  - THETA waves
  - DELTA waves
<table>
<thead>
<tr>
<th>Wave Type</th>
<th>Frequency &amp; Amplitude</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta Waves</td>
<td>• High Frequency</td>
<td>• Normal Waking Consciousness</td>
</tr>
<tr>
<td></td>
<td>• Low Amplitude</td>
<td>• Focused attention</td>
</tr>
<tr>
<td>Alpha Waves</td>
<td>• High Frequency</td>
<td>• Relaxed or meditative state</td>
</tr>
<tr>
<td></td>
<td>• Slightly higher Amplitude than Beta waves</td>
<td></td>
</tr>
<tr>
<td>Theta Waves</td>
<td>• Medium Frequency</td>
<td>• Early stages of sleep</td>
</tr>
<tr>
<td></td>
<td>• Irregular pattern of Amplitude</td>
<td></td>
</tr>
<tr>
<td>Delta Waves</td>
<td>• Low Frequency</td>
<td>• Deepest stages of sleep</td>
</tr>
<tr>
<td></td>
<td>• High Amplitude</td>
<td></td>
</tr>
</tbody>
</table>
Identify and describe each type of EEG brain wave pattern in terms of:

- Frequency
- Amplitude

In which state of consciousness they are likely to occur?

A

B

C

D
Heart Rate

Heart rate can either increase or decrease during an ASC as compared to the usual heart rate during the normal waking consciousness for that particular individual.

- **DECREASES during:**
  - Sleep
  - Unconsciousness
  - Meditation

- **INCREASES during:**
  - Intake of stimulant drugs,
  - Periods of arousal
Body Temperature

- Body temperature is less variable than other physiological indicators of ASC.
- The most predictable change in temperature is during sleep when the body temperature decreases by more than 1 °Celsius.
Galvanic Skin Response (GSR)

- GSR indicates a change in the resistance of the skin to an electrical current → how much conductivity is there on the skin.
- As a person sweats more, the resistance to an electrical current decreases
  - More sweat = more electrical current can pass = LESS resistance
- Electrodes are placed on the skin to measure the conductivity of the skin.
- High emotional arousal = more sweat = less resistance
- During an ASC there could be either an increased or decreased level of arousal, hence the GSR can be used as a comparison to the person’s usual level during normal waking consciousness.
<table>
<thead>
<tr>
<th></th>
<th>Normal SOC</th>
<th>Altered SOC (Sleep)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body Temp</strong></td>
<td>Higher</td>
<td>Lower during sleep by less than 1°C</td>
</tr>
<tr>
<td><strong>Heart Rate</strong></td>
<td>Higher when aroused</td>
<td>Slower during sleep; increased with stimulant drugs</td>
</tr>
<tr>
<td><strong>GSR</strong></td>
<td>High when aroused; low when relaxed</td>
<td>Could be either higher or lower than normal → used as a comparison to person’s usual level during normal waking consciousness</td>
</tr>
<tr>
<td><strong>Brain Electrical Activity</strong></td>
<td>Beta waves when focused; Alpha waves when relaxed</td>
<td>Alpha waves during meditation; Theta waves – early sleep Delta waves – deep sleep</td>
</tr>
<tr>
<td><strong>Psychological Differences</strong></td>
<td>Alert; aware; focused attention; able to maintain self-control</td>
<td>Less alert; inability to maintain self control; emotions experienced uncharacteristically; disturbed sense of time; sensations &amp; perceptions distorted</td>
</tr>
</tbody>
</table>