



# Consciousness

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## Introduction

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### ***Introspective Psychologists***

- Regarded the study of the mind as the key to understanding everything about people, believing that careful analysis of conscious experiences would allow them to discover the workings of the mind.

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## Challenging introspection

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- Idea challenged by *Psychoanalysis* and *Behaviourism* :
  - **Freud** – Much of the mind's operation is unconscious, taking place without the individual being aware of it, therefore questioning the Introspection.
  - **Behaviourism** – Insistence that human behaviour could be seen as the result of S-R conditioning.

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## Definitions of consciousness

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- A state of awareness of ourselves and environment
- A domain of mind that contains the sensation, perception, and memories of which one is momentarily aware (attending to; selective attention).
- To be human is to possess not only self-awareness but the even more remarkable capacity to scan and review mentally that which we are aware of.

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## States of consciousness

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- Consciousness
  - Our awareness of various cognitive processes
- Waking consciousness
  - Mental state that encompasses the thoughts, feelings, and perceptions that occur while we are awake and relatively alert
- Altered state of consciousness
  - Mental state that differs noticeably from normal waking consciousness

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## Examples of Altered Consciousness

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- Daydreams
- Sleep
- Dreams
- Drug-altered consciousness
- Meditation
- Hypnosis
- Out-of-body experiences

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## Discussion points

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- Is it really possible to define consciousness?
- What is the function of consciousness?

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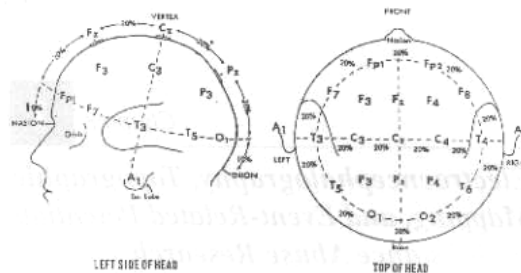
## Studying consciousness

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- Consciousness has been studied in many ways:
  - Physiological studies of consciousness and neural activity (sleep)
  - Studies of sensory deprivation (including blindness)
  - Effect of Psychoactive drugs/consciousness-affecting
  - Hypnosis

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## Consciousness and Neural Activity



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## EEGs

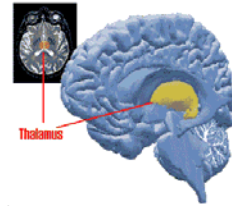
- **EEGs** – Electro-encephalogram recording have shown that different types of subjective awareness are reflected to some degree in EEG's.
- Four major types of wave (measured in frequency of 100 microrvolts)
  - **Delta** (1 – 3 Hz) – These are found mainly in infants, sleeping adults, or adults with brain tumours.
  - **Theta** (4 – 7 Hz) – Children aged 2 – 5 years, Psychopaths, frustration, and concentration.
  - **Alpha** (8 – 13 Hz) – Awake adults, relaxed, daydreaming.
  - **Beta** (13 Hz+) – Adults who are wake, alert, and concentrating on tasks.

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## Brain studies

### ***Penfield & Rasussen*** (1950)

- Proposed that consciousness was mainly located in the Thalamus and the upper part of the brain stem.



- However, based on animal studies:
  - Cerebral cortex removed – signs of consciousness
  - Cerebral cortex and brain stem removed – no signs of consciousness

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## Split brain studies

- To support the idea that consciousness is more concerned with overall function...
- ***Gazzaniga & Sperry*** (1967)
  - Split brain studies
  - Case studies of one part of the brain making decisions independently of the other.
- However, despite commonality in split brain patients, does not tell us where or what consciousness is, though it does tell us that it is unlikely to be simply a function of the brain stem!

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## Sensation and Consciousness

Any experiences of sensory deprivation tanks?

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## John Lilly

- Pioneer researcher into the nature of consciousness using as his principal tools the isolation tank, dolphin communication, and psychedelic drugs.
- Made contributions in the fields of biophysics, neurophysiology, electronics, computer science, and neuroanatomy.
- Pioneer in attempting interspecies communication between humans and dolphins.
- Physician and psychoanalyst
- Invented the isolation tank.



## Sensory deprivation (Lilly 1977)

- Participants reported "*different levels of consciousness and a deeper sense of self awareness*".
- Further studies demonstrated experiences of hallucinations, out-of-body experiences, and other sensory or emotional experiences, though controversial.
  - **Hypothesis 1** : Because the brain was unable to maintain consciousness without having continuous sensory input, therefore created sensory input synthetically when it had to.
  - **Hypothesis 2** : Not all participants experienced hallucinations. Those who did had them as a result of pre-existing anxieties or because they expected to have them.

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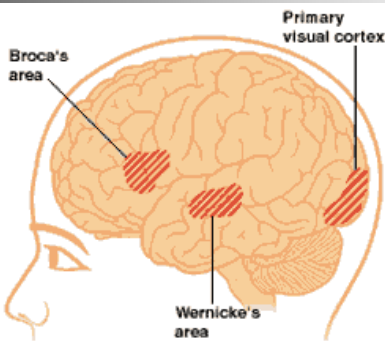
## Sensory deprivation



- Over-time, research into sensory deprivation has become less popular.
  - However, the idea that restricting sensory input could allow deeper levels of consciousness has been taken on by researchers into parapsychology.
- **Ganzfeld Technique** – Producing near-sensory deprivation to reduce irrelevant stimuli, therefore focusing clearly on extra-sensory information.

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## Blindsight and Amnesia



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## Blindsight

- Occurs when the *visual cortex* (aka striate cortex), is damaged.
- **Holmes** – Demonstrated in studies of shrapnel injuries of soldiers, damage to this area produces blindness
  - Amount of blindness corresponds to the amount of damage the area has received.
- Early studies with monkey showed that they were still able to respond to visual information despite having the visual cortex completely removed. They were able to detect visual events, and carry out simple pattern discrimination, though not as well as fully sighted individuals.

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## Led to investigation on humans

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### *Pöppel, Held, & Frost (1973)*

- People with damage to the visual cortex often able to respond to visual stimuli in the blind area, though not consciously.
- Instead, researchers needed to make their investigations into a game, asking the participants to 'guess' what they might be able to see if they could.
- Participants were able to detect visual events, discriminate between patterns, and track moving objects by pointing.

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## Blindsight

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- Therefore, phenomena called blindsight because such people are completely unaware of seeing anything, though still able to detect and respond to stimuli in the area.

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## Blindtouch

### **Paillard, Michael, & Stelmach (1983)**

- Case study of lady with a lesion in the sensory-motor cortex, which made her unaware when the corresponding area of her skin was touched...
  - However, when asked to 'guess' when her skin was being touched, her response was far more accurate than a complete lack of sense.

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## Amnesiacs and cortical lesions

### **Warrington & Weiskrantz (1982)**

- Show similar characteristics to blindsight, though unable to remember new information consciously, often show good memory retention as long as the task does not involve them knowing what that they have remembered!
- Therefore no conscious memory of the experience, entirely unconscious!

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## Amnesiacs and cortical lesions

### Some memory tasks achieved successfully by amnesiac patients

- Motor skill learning (e.g. pursuit, maze)
- Visual discrimination learning (Difference...?)
- Cued recall of words and pictures (have you seen..?)
- Verbal paired-associate learning (pencil-pen)
- Solving jigsaw puzzles
- Arranging specific words into specific sentences
- Mathematical problem-solving
- Mirror reading

*Source:* Warrington & Weiskrantz, 1982

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## Consciousness and hypnosis



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## Group discussion

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- Is hypnosis a special state of consciousness and awareness?
- Can anyone experience hypnosis?
- Can hypnosis enhance the recall of forgotten events?
- Does personality have anything to do with hypnosis?

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## Defining hypnosis

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- A social interaction in which one person (the hypnotist) suggests to another (the subject) that certain perceptions, feelings, thoughts, or behaviors will spontaneously occur.

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## Posthypnotic Amnesia

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- ***Supposed*** inability to recall what one experienced during hypnosis
- Induced by the hypnotist's suggestion

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## Posthypnotic Suggestion

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- Suggestion to be carried out after the subject is no longer hypnotized
- Used by some clinicians to help control undesired symptoms and behaviours
- Can be effective for headaches, asthma, etc!

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## Posthypnotic suggestion

### Orne & Evans (1965)

- Hypnotised group told to dip hand in fake acid, then throw the “acid” in assistant's face
- Control group instructed to “pretend”
- Unhypnotised subjects performed the same acts as the hypnotized ones

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## Unhypnotised persons can also do this?



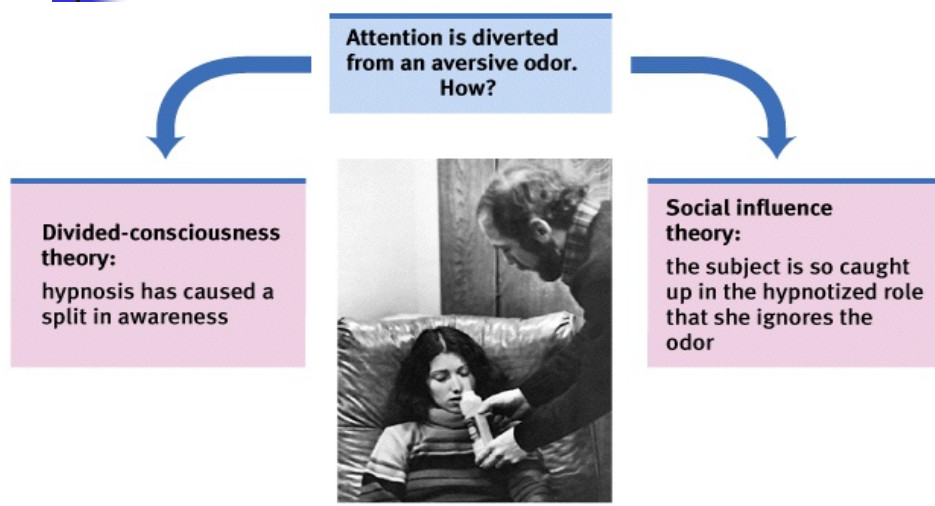
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# Hypnosis

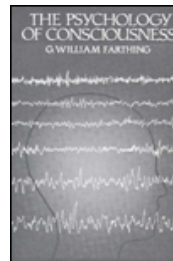
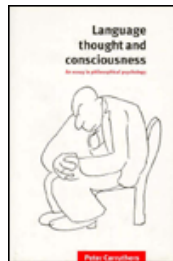
- Dissociation
  - A split in consciousness
  - Allows some thoughts and behaviours to occur simultaneously with others
- Social Influence Theory
- Hidden Observer
  - Hilgard's term describing a hypnotized subject's awareness of experiences, such as pain, that go unreported during hypnosis

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## Explaining Hypnosis: Divided Consciousness or Social Phenomenon?



## References



- Carruthers, P. (1998) *Language, thought, and consciousness – an essay in philosophical psychology*. C.U.P. \*
- Farthing, W.G. (1992) *The Psychology of Consciousness*. Prentice-Hall, N.J. \*
- *Journal of Consciousness Studies* – Good readable reviews on consciousness in relation to biology.

\*Books available at the Birkbeck library

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## Internet links

- <http://members.tripod.com/~BilgiNet/index.htm> - Links to articles on all topics and debates in the area of consciousness.
- <http://www.uwsp.edu/acad/psych/t drugs.htm> - Very good site for articles, links, topics and laws regarding the use of drugs and their effects upon the brain.
- <http://www.sfu.ca/~mcantle/biorhyth.html> - Detailed tutorial on sleep, dreaming, and biological rhythms with a useful reading list.
- <http://www.sleepnet.com/index.shtml> - Very useful and entertaining page containing links, tests, research, resources and details of sleep disorders.
- <http://goinside.com/97/4/barber.html> - Long tutorial with everything you could possibly want to know about hypnosis.

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## Review questions

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- What kind of analogies might give useful insight into consciousness?
- What are the main methods which have been used to study consciousness?

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## Further background reading

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- Theories of Consciousness :
  - Elements of consciousness - Wilhelm Wundt (1962)
  - Evolutionary approaches - Humphrey (1962)
  - Monitoring – Weiskrantz (1988)
  - Integrated Global Representation (IGR) - Sommerhoff (1966)
- Dreaming :
  - Freud's on dreaming
  - Dreaming as a means remembering/forgetting
  - Making sense of dreams

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