Week 1 NOTES – Consciousness

Consciousness – Anything that we are aware of at a given moment forms part of our consciousness, making conscious experience at once the most familiar and most mysterious aspect of our lives. The subjective awareness of mental events.

- Study of consciousness is not new – John Locke was first to use the modern meaning of consciousness – but it was tied up with morality.
    - The idea that one should be hold accountable only for something they have consciously achieved.

What is Consciousness?

- Awareness of self & environment (identity, body position etc).
- At any given moment, the mental events you are aware of exist at a conscious level
- Focus concentration, reflect, plan
- Understand sensory input as a single, accessible representation
- Make sense of our environment
- Awareness of physiological & emotional needs
- Awareness of motility in our existence
- What do I want out of life (goals)?

Necker Cube – visual representation of a cube, not an actual cube. Conscious experience is shaped by processes outside of awareness trying to make a decision what you are looking at & neither decision is a better one that's why it never settles on one.

Levels of Consciousness:
Conscious – what we are aware of
Pre-conscious – that which we are not aware of but can be brought to mind (memory)
Non-conscious – outside of awareness (e.g. heartbeat, blood pressure)
Sub-conscious – not aware of but influences conscious thought

- Original Freudian but now consider things like stereotypes, schemas, core beliefs etc.
- Freud – Id, Ego, Superego

Functions of Consciousness: Why do we have consciousness?

- EVOLUTIONARY ADVANTAGE to consciousness
- Construct of the sensory world more accurate
    - Monitor self and environment
- Behavioural responses are enhanced & more appropriate
    - Consciousness allows us to plan/regulate thought and behaviour – goal focussed (long-term)
    - Problem solving/reasoning
    - Reflexive system not useful for complex processing
- ESSENTIAL to processing complex information and LEARNING complex/new behaviours
- Focus attention/concentration
- BUT conscious processing is a limited resource
- Mastered behaviour becomes → Automatic
    - Frees up consciousness
        - E.g. Driving is a classic example of a consciously learned skill which becomes automatic

Attention – process of focusing conscious awareness. Providing heightened sensitivity to a limited range of experience requiring more extensive info processing.

- Allocating mental energy
- Enhanced processing of stimuli we attend to
- Reduced processing/perception of other stimuli
- We assume that if something happens in our environment, we perceive it. But – important role of attention is consciously perceiving our environment

Attention – Controlling perception

- Attentional control vital – prevents us being overwhelmed
    - Direct attention where we think it is most needed
        - Overtly & covertly (attentional gaze)
- Attention can be voluntarily controlled
    - Top-down processing involved
    - Guided by expectations, motivations, beliefs etc.

  Attentional control can also be involuntarily
    - Bottom-up process

        - E.g. loud noises, light/colour change, movement etc.

But, Attention

- Takes effort
- Is limited
    - Limits depend on type of task (s)
    - Similar resources? Automatic?
- So, when attending to a particular thing, perceptual system can be ''blind'' to other aspects of our environment (or ourselves). So, we can sense, but not perceive.
    - Inattentional/change blindness
    - We don't perceive the majority of our environment

Attention & Perceptions

- However, in order to choose what to focus our attention towards, we also have to choose what not to focus on…
    - So, we must be processing stimuli at some level
        - Cocktail party phenomenon – Brain's ability to focus one's auditory attention (**effect** of selective attention in brain) on a particular stimulus while filtering out a range of other stimuli, as when a partygoer can focus on a single conversation in a noisy room.
- Conscious perception requires attention, but in order to allocate attention, a lot of implicit processing is occurring outside of awareness (subconsciously)
    - Complexities of our consciousness & perceptual system.

Processing outside of Conscious Awareness – much info is processed outside of consciousness

- Shift attention – not aware of shifts
- Well learned tasks are referred to as automatic
- Priming is exposure to a stimulus that influences behaviour later on, without that individual being aware of the guiding influence.
- Subliminal perception – too fast for conscious
- Reconstruct memory – do not typically do this consciously -
- First impressions (gender, age, appearance) – reactive
- Process info in parallel – we could not possibly consciously process every bit of info when identifying.

General anaesthetic – don't really know how it works.

- People under GA presented with 15-word pairs. Afterwards did not remember anything but when presented with one word they could say they next word.
- So, somewhere in the brain that info was processed & retained.

Subliminal processing:

- Subliminal stimuli are sensory stimuli below the threshold for conscious perception
    - Attended to by the brain, but not consciously perceived
- Visual stimuli are flashed before an individual can process them, or flashed & then masked, which interrupts processing
- Audio stimuli may be played below audible volumes/masked.

Subliminal Perception

- Palmatier & Bornstein (1980) found that subliminal messaging improved the progress of subjects attempting to quit smoking compared to those participants not exposed to subliminal messages.
- But evidence for subliminal persuasion is inconsistent – unlikely to be effective
    - Short-term cognitive & emotional effects possible
        - E.g. present '' happy'' face, individual is more likely to like the next stimuli
- fMRI studies show that subliminal stimuli activate specific cortical regions despite participants being unaware
- Using stimuli that are not consciously perceived, we can test the arousal responses in psychiatric populations, such as those suffering from anxiety, depression & schizophrenia
- Method can be used to evoke non-volitional (non-voluntary) brain mechanisms that may underlie such disorders.

Consciousness is KING

- Monitors all tasks
- Routine tasks are automatic
- Sensory systems – register stimuli rapidly & simultaneously
    - New stimuli challenges Conscious
    - Limited amount
    - Slow, focused processing
    - Voluntary acts, problem solving, communicate.

Altered States of Consciousness

Hallucination

- Create realistic perceptual experiences in the absence of external stimuli
- Do not confuse with delusions – delusions are not based on reality
- Most will be auditory
- Visual – not necessarily an image, can be a notion/flash
- Brain areas involved in normal perception become active during hallucinations
- Common in anxiety disorders, where person may see something in periphery (something running past them)
- But they are not often reported, as people think you have to have Schizophrenia to have an hallucination.
- Create realistic perceptual experiences in the absence of external stimuli
    1. Olfactory (smell – petrol)
    2. Gustatory – taste
    3. Tactile – bugs on/under skin
- can occur through misperception or imagination – not just psychological illness.
- Different from delusion which is the belief not based in reality (most will be auditory – schizophrenia).

Deja – VU – sense that you have experienced something previously and or predict what is going to happen
- Approximately 60=% of people have experienced are likely to be high income, university educated and liberals.
- Neuropsychology – small seizures in right temporal lobe associated with feelings of familiarity.

CAPGRAS SYNDROME:
- Disorder in which a person believes that a friend/family member has been replaced by an imposter
- Most commonly occurs in schizophrenia, but has also been seen in brain injury and dementia patients
- Reported in some neurodegenerative diseases.
- Origin is a disconnection between the temporal lobe, where the faces are usually recognised, and the limbic system involved in emotion.

STIMULANTS: COCAINE
- Strong stimulant – increases levels of the neurotransmitter dopamine – reward
    - Very powerful reinforcer – euphoria, excitement and wellbeing
- Prevents dopamine reuptake – high feeling
- But dopamine receptors reduce – long-term changes to cortical reward system
    - Tolerance often develops; therefore, individuals experience less pleasure than from their first exposure
    - Increased dose needed – perpetuates long-term changes to dopamine (reward) system.
    - Difficult to respond to normal everyday rewards (food, sex etc.).
- Part of the reason why cocaine is addictive is because cocaine blocks the reuptake of dopamine so that it floods the synapse.
    - Results in too much uptake by dopamine receptors in postsynaptic membrane.

Depressants: Alcohol
- Most commonly used and abused drug today
- CNS depressant, not stimulant
    - Relaxation, elevated mood, impaired judgement
- Depressant effects obvious at higher dose
    - Cortical activity is lowered, thinking impaired, movement & coordination difficult, affect changes
- Serious withdrawal symptoms – some fatal
    - Delirium tremens (DTs) – disorientation, confusion, visual hallucination, memory deficits, tachycardia, hypertension, hyperthermia, diaphoresis, heart attack, cardiac arrhythmia, stroke, paranoia.
        - Treated using high doses of benzodiazepines.

Lecture Summary:
- Awareness of self and environment
- Focus concentration, reflect and plan
- Many different levels of consciousness
- Altered states of consciousness can occur naturally in some disorders
- Drugs & alcohol impact upon human consciousness

Week 2 Notes – Consciousness Part II

What is sleep? Sleep is a source of comforting mental and physical relaxation.
- Sleep is vital to our wellbeing, but we know little about it
- A naturally (recurring) state – reduced consciousness, suspended sensory activity & paralysis of nearly all muscles at some stages
    - Different to unconsciousness, anaesthetic
- Occurs in almost all animals