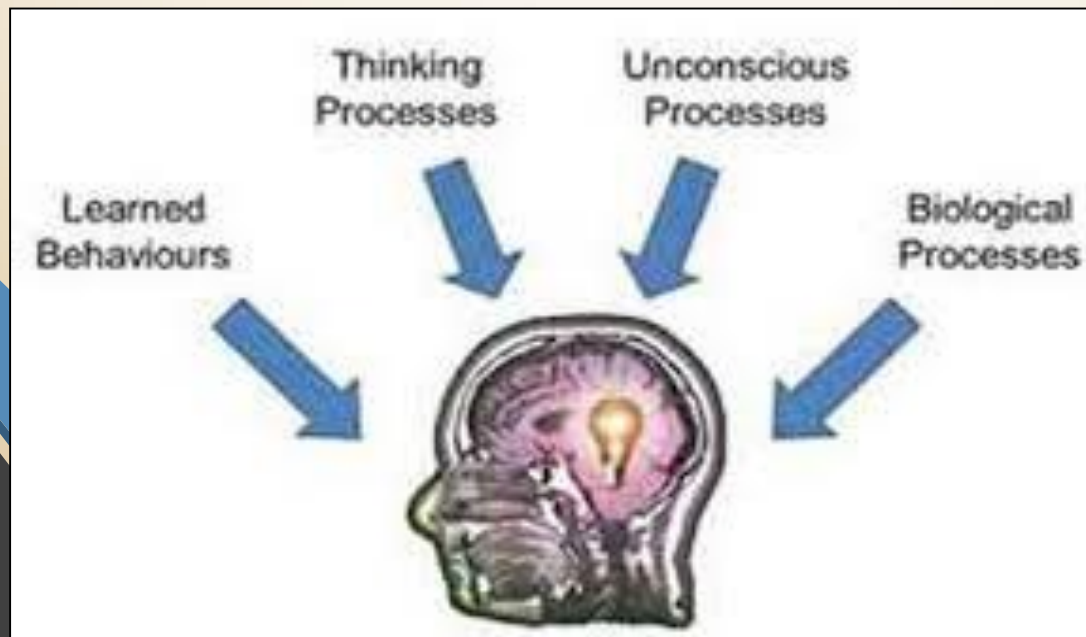


Lecture 3: Paradigms, Aetiologies and Therapeutic Techniques



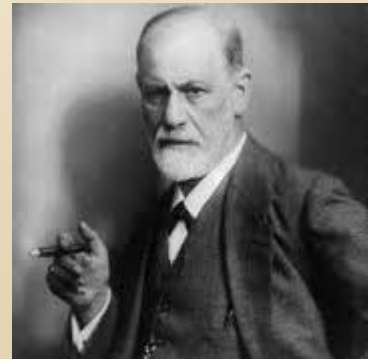
The Biological Paradigm

- The search for biological abnormalities which cause abnormal behaviour. E.g. The discovery of general paresis and syphilis (Ehrlich, 1910).
- But, 1800's: no non-invasive way to observe the structures of the brain.
- Was impossible to look at structure-function relationship in the living.



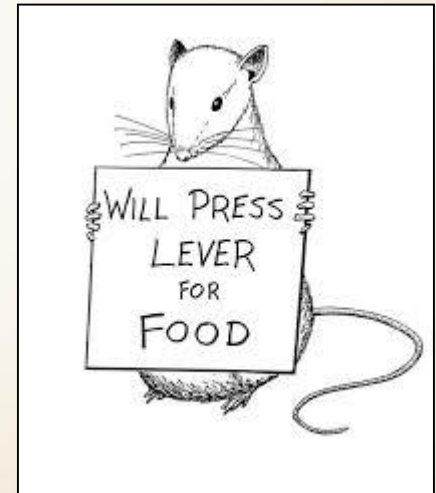
The Psychodynamic Paradigm

- Freud (1856-1939) – unconscious mental conflicts.
- The psychological becomes physiological.
- The ego protects itself from neurotic anxiety via defence mechanisms- unconscious self deceptions to reduce anxieties.
- Psychosexual Stages of development



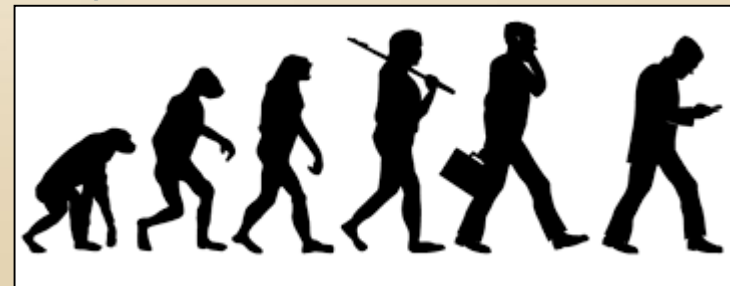
The Behavioural Paradigm

- Pavlov- Classical conditioning
- Watson- “little Albert”
- Skinner- Operant conditioning
- How do these relate to mental illness?
- All mental illnesses are a product of learning and conditioning.
- Think learned helplessness.



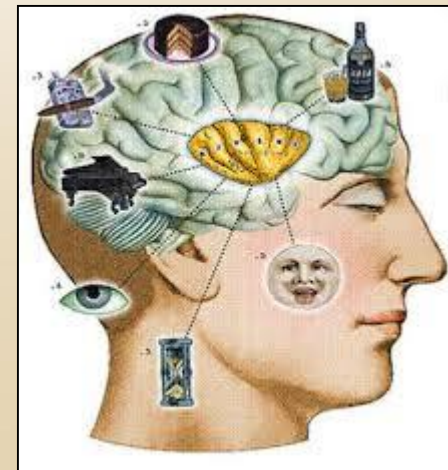
Beyond classic Behaviourism...

- Observational learning
 - Albert Bandura
 - “Bobo doll” studies-
 - how does this relate to psychopathology?
- Evolutionary history
 - Influences behavior
 - Particularly fears and phobias- how/why?



The Cognitive-Behavioural Paradigm

- Building on from Behaviourism and Bandura's social learning theory- the recognition of mental processes in the internalisation of behaviour.
- The move away from the 'Tabula Rasa' to the importance on PROCESSES and INTERPRETATION of the environment.



The Humanistic Paradigm

- All behaviour is a result of our FREE WILL.
- We have choice, control and responsibility for our behaviours.
- Because free will is not predictable, the ultimate causes of abnormal behaviours are unidentifiable.
- Completely opposite to other approaches.



The problem with paradigms

- Kuhn (1962) – paradigms can direct and misdirect us, the focus on the psychological perspectives may be too narrow to encompass all contributory factors leading to abnormal behaviour and also focus too heavily on the medical model of mental illness.
- When do we know which approach/perspective is the most useful and how/why?

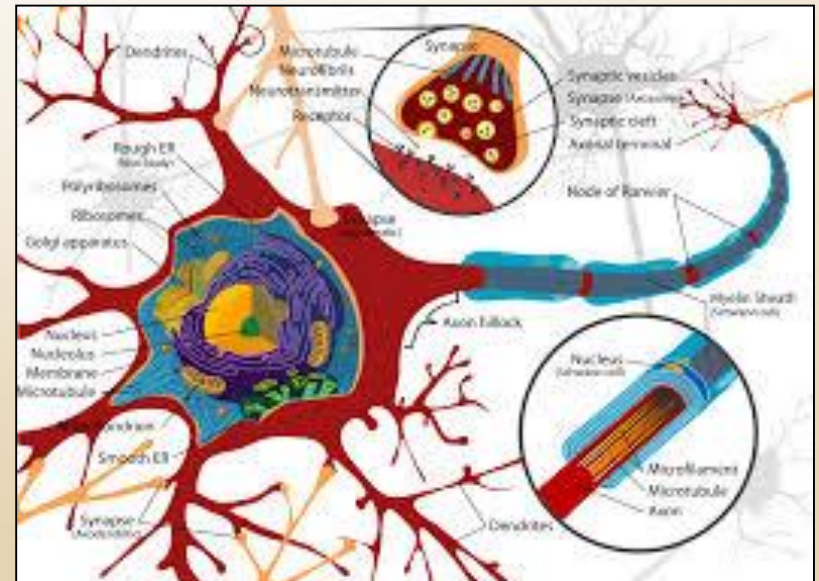
Developmental Psychopathology

- This emphasises change over time based around 'developmental norms' (Cicchetti & Cohen 1995).
- Important for normal and abnormal behaviours.
- Important to consider premorbid histories of individuals as well as the predictable prognoses of certain disorders.



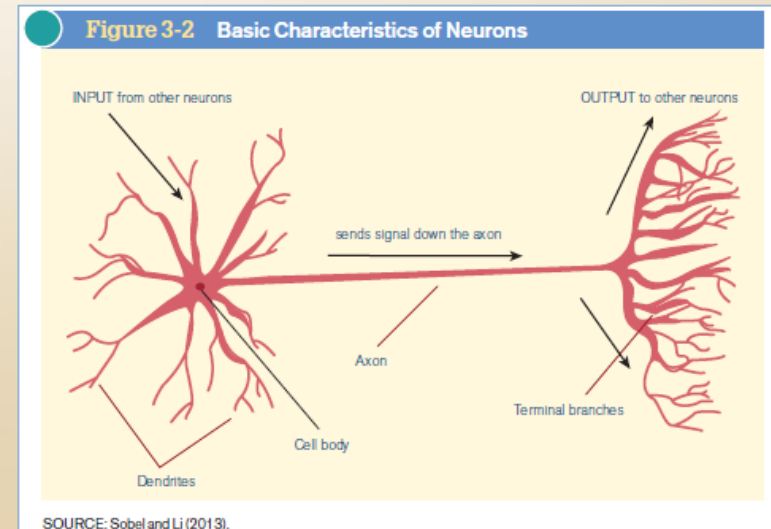
Biological Factors

- Brain anatomy and physiology
- Hormones and neurotransmitters
- Genetics and inheritance
- Brain injury or insult
- Illness or infection



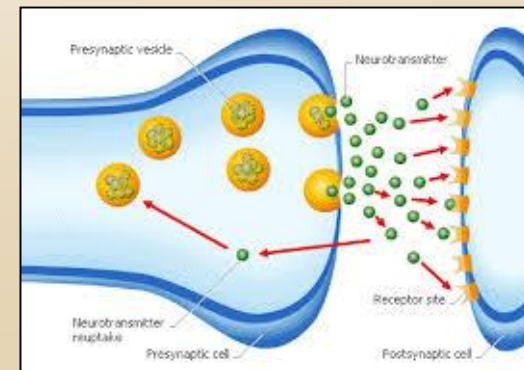
Basics of neuronal communication

- Neurons connected by branching dendrites.
 - Synapses
 - Chemical or electrical
 - Neurotransmitters
 - Action potentials (from near cell body) at a critical value of electrical activity
 - Excitatory or inhibitory



Basics of neuronal communication: Neurotransmitters

- Two **structural** categories: Small molecule and large molecule.
 - Small molecule: Single amino acid
 - Large molecule (neuropeptides): 3-36 amino acids
- Three **functional** categories:
 - Mediate communication: Glutamate and GABA
 - Pain system: Opioid peptides
 - Large system communication: serotonin, dopamine, adrenaline and noradrenaline

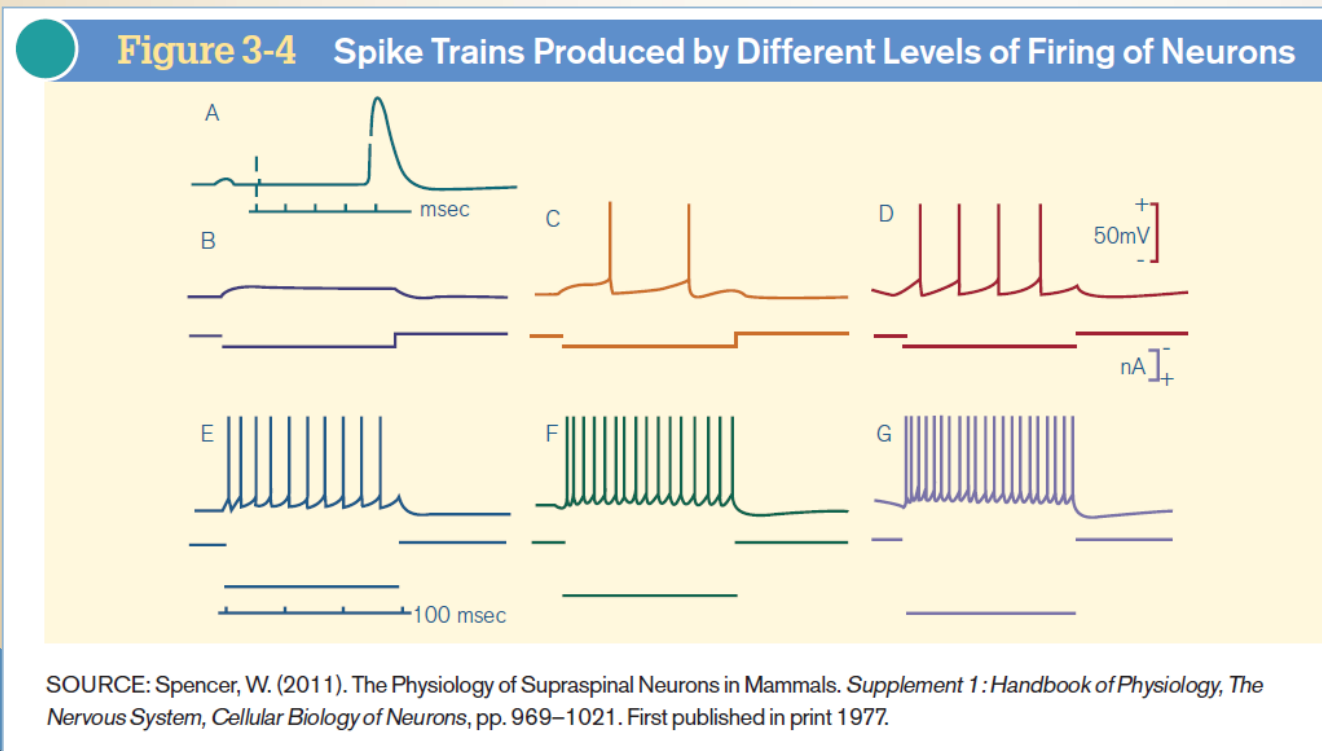


Basics of neuronal communication

- Passing information from one neuron to another involves a number of steps.
 - Neurotransmitters need to be created and stored.
 - Action potentials travel down the axon to the terminal.
 - Neurotransmitter is released into synapse.
 - Neurotransmitters then bind with specific proteins in the post-synaptic neuron.
 - This binding increases (excitatory) or decreases (inhibitory) the likelihood of an action potential.
 - Synapse returns to neutral and neurotransmitter is removed.

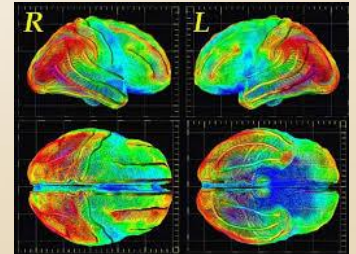
Basics of neuronal communication

- Information is encoded in the number of action potentials which are recorded as spike trains



Neurons to neural imaging

- With roughly 200 trillion connections between neurons understanding these connections on a neural level would be impossible.
 - Solution: Neural imaging.
 - Different techniques used to record different types of cortical activity.
 - Three most common neuroimaging techniques:
 - EEG
 - MEG & PET
 - fMRI
 - Advantages and disadvantages to each → Spatial vs temporal resolution.



Neuroimaging: EEG

- Reflects synaptic level activity.
- Can measure activity with as little as 2 electrodes → or high density EEG
- EEG used to infer processing in the brain.
 - Specific wave associated with specific processes



Small child wearing high density array electroencephalography cap

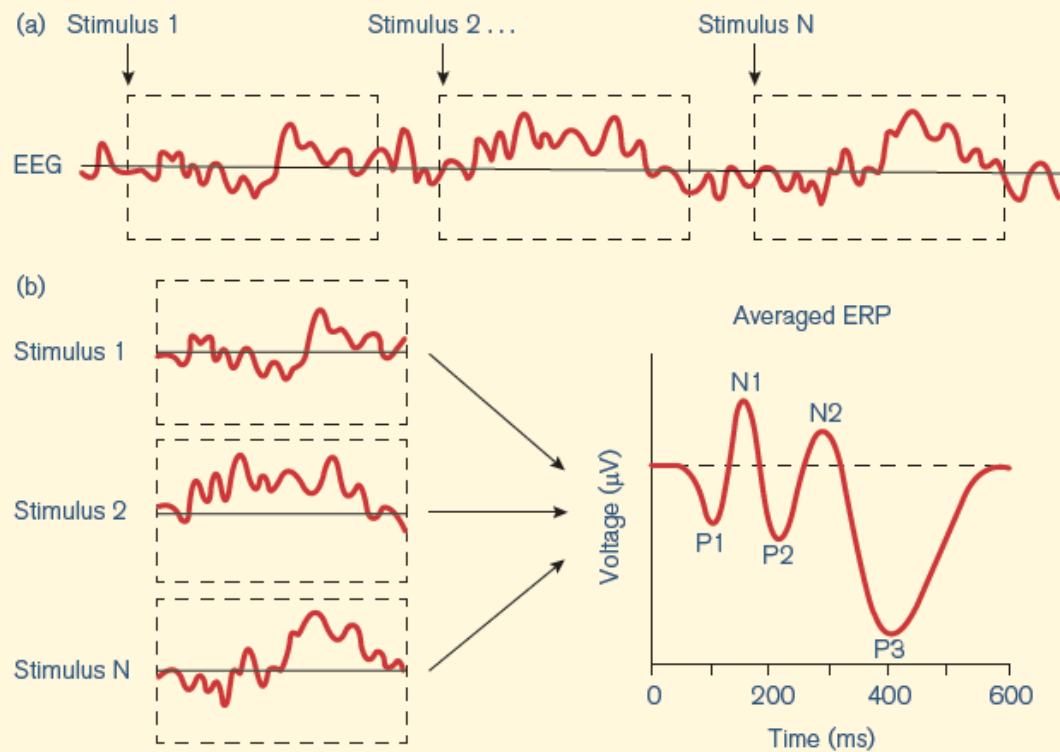
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EEG and ERP

- ERPs (evoked potentials) are EEG signals linked to a specific event.
- Can be cognitive, emotional, or sensory stimuli.
 - Described in terms of negative or positive peaks and their timing.
 - Example: P300 = positive wave peaks at 300ms post stimulus onset.
- EEG/ERP has great temporal resolution but poor spatial resolution.

EEG and ERP

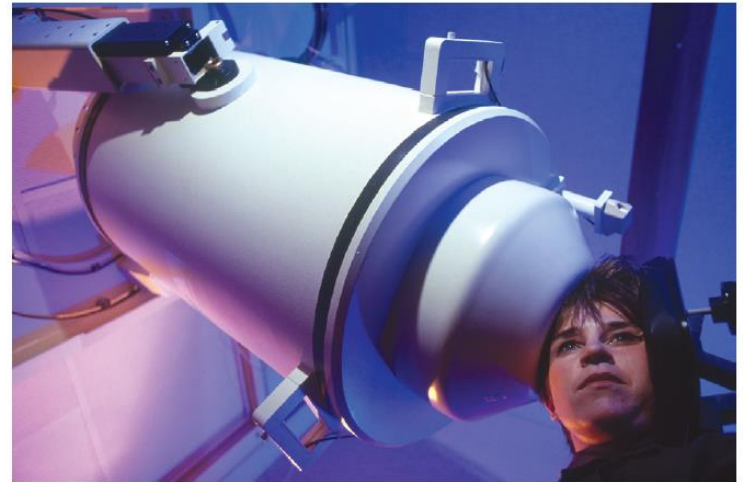
Figure 3-8 Extraction of the Event-Related Potential Waveform From the Ongoing Electroencephalography



Reprinted from *Trends in Cognitive Sciences*, Vol. 4, Steven J. Luck, Geoffrey F. Woodman, and Edward K. Vogel, Event-related potential studies of attention, pp. 432–440, Copyright © 2000, with permission from Elsevier.

Neuroimaging: MEG

- Used to detect small magnetic changes during activities of neurons.
- MEG signals are similar to EEG except the spatial resolution is better.

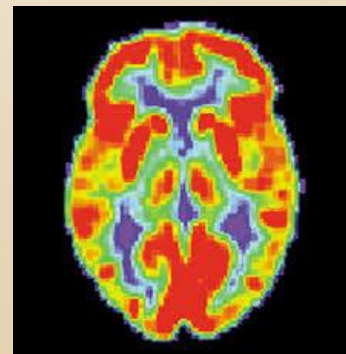


Person sitting in SQUID to measure magnetoencephalography

© Hank Morgan/Science Source

Neuroimaging: PET

- PET stands for positron emission tomography. Unlike CAT scans, which produce a 3D still picture, PET scans can be made in real time. This means researchers can observe a PET scan change while a person thinks about various things.
- PET scans typically use glucose labelling with a radioactive isotope. Glucose is the brain's main source of energy. As brain cells consume chemically labelled glucose, positrons are emitted. The PET scan reveals which areas of the brain are burning the most.



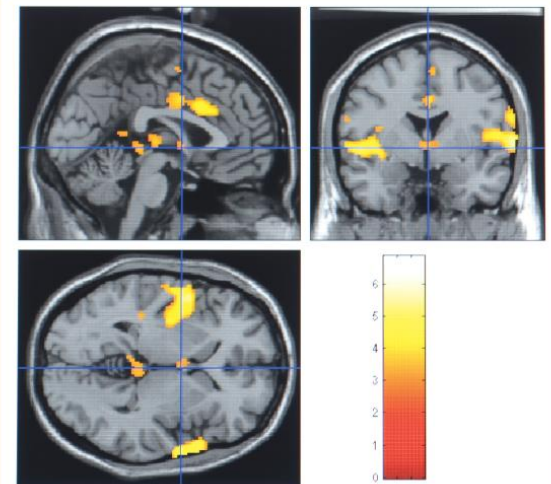


- One study showed "the first physiological evidence of voices in a schizophrenia sufferer. Individuals with schizophrenia generate language in the normal language-production areas of the brain that they interpret as somebody else's voice (Goleman, 1993).
- Because of fMRI it is no longer the 'choice' unless specific neurotransmitter activity is under investigation.

Neuroimaging: fMRI

- Measures changes in cortical blood flow while a subject participates in a task.
- Can demonstrate what areas of the brain are active during information processing.

Figure 3-11 Functional Magnetic Resonance Imaging—Color Reflects the Amount of Activity Seen in a Particular Brain Area



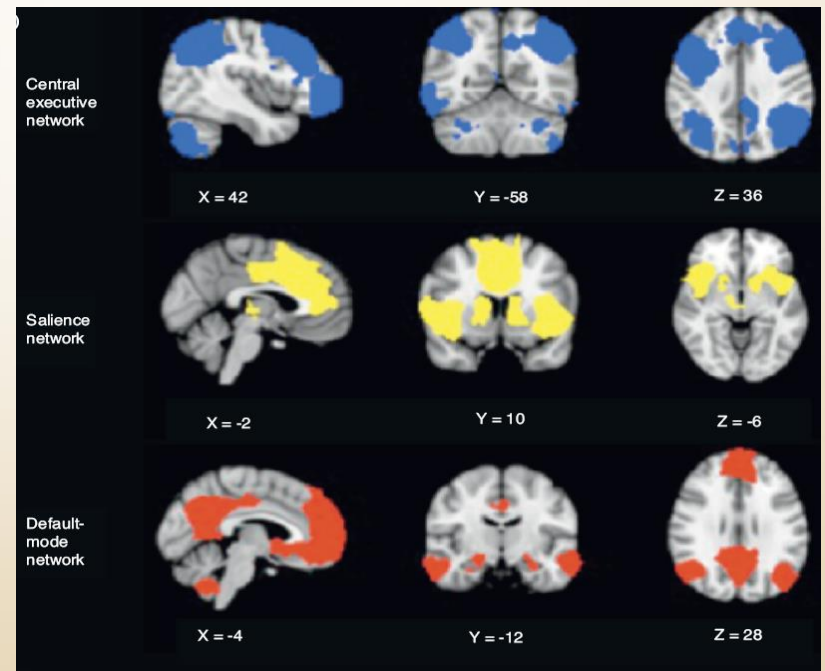
SOURCE: © Zephyr/Science Source.

Brain networks

- Several areas of the brain work together to coordinate complex functions.
 - Emotions, cognition, and motor processes.
- Psychopathology is similarly complex and often not limited to a single area.
 - Network wide processing disturbance.

Brain networks

- Intrinsic (default) network
- Active networks
 - Central executive network
 - Higher order cognitive and attentional tasks
 - Salience network
 - Monitoring external events and internal states



Major brain structures and their behaviours

Hindbrain- medulla, pons, cerebellum

- Few abnormal behaviours arise from here, this area is for basic bodily functions.

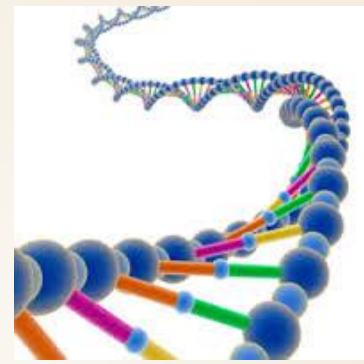
Midbrain- RAS, pons and medulla

- Activities such as fighting, sex, sleeping and waking. Disorders of sleep, sexual behaviour and aggression.

Forebrain- limbic system (thalamus/hypothalamus). Cerebral hemispheres

- Basic biological urges, eating, drinking, sex, and ANS functioning. Endocrine system.

Genetics: Inheritance



- Genotype- actual genetic structure
- Phenotype- the expression of a genotype
- Polygenic disorders- multiple genetic influences
- Genetic influence on brain development?
 - Maternal vs paternal influence
- Maternal inheritance: Mitochondrial inheritance

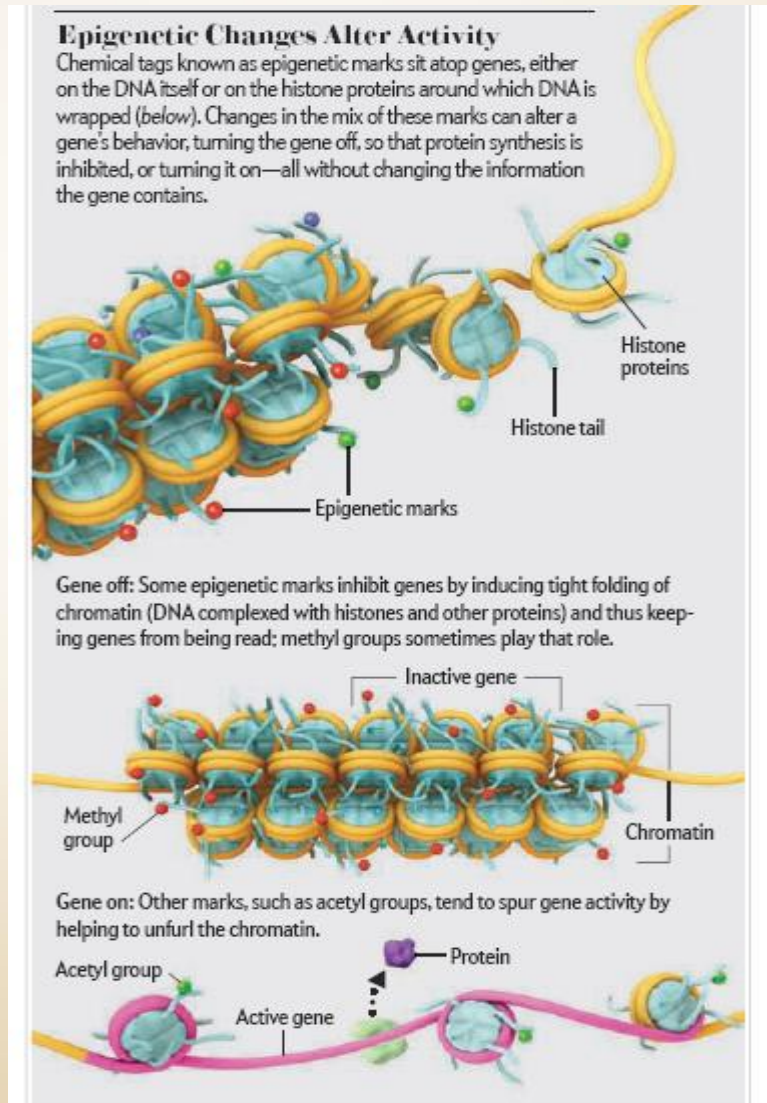
Studying genetic factors

- Twin studies, monozygotic, dizygotic
 - Family history studies
 - Adoption studies
-
- What about gene environment interactions (Plomin, 2008)
 - Active, passive and reactive.



Epigenetics

- Genes can be modified by experience/environment.
 - Epigenetic markers “tags” promote (writers) genetic activity or inhibit (erasers) genetic activity.



Epigenetics: Example

- Weaver et al. (2004) the impact of passive vs. active nurturing rat mothers.
- Mothers grooming style influenced development of offspring.



Mother taking care of her pups

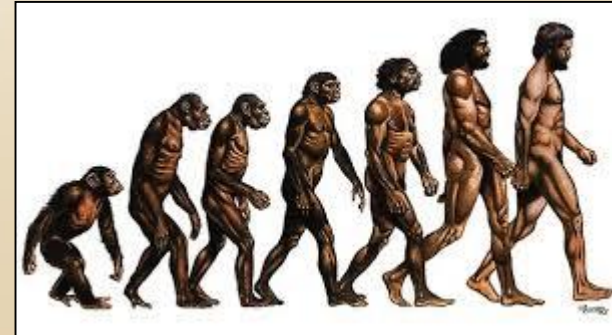
Photo by Seweryn Olkowicz, Wikipedia

Evolutionary perspective

- Both physical and cultural environment influence genetic change.
- Also possible that metacognitive factors influence gene expression.
- Complex set of physical cultural and emotional factors influence the development of psychopathology.

Evolutionary perspective

- Genetic aspects of psychopathology evolved and were maintained in the human population.
- Maladaptive traits may have once benefited the species.
- Example 1: Schizophrenia is maladaptive yet it is maintained in the human population at ~1%
- Example 2: Personality disorders: Psychopaths are excellent at manipulating people.
- In some circumstances psychopathy may be beneficial.



Evolutionary psychopathology: Questions

- Is the experience of mental illness universal?
- Does the pathology have any potential adaptive value?
- Is there evidence for pathology across human history?
- Is pathology qualitatively different from normal functioning?
- Is there a possible protective function?
- Is the particular pathology a recent process?

Psychological Factors

- Human nature- as a result of evolution, attachment and dominance.
- Temperament- OCEAN and personality traits.
- Emotions- love, joy, surprise, anger, sadness and fear.
- Learning and Cognition- conditioning, modelling, social cognition.
- Self and Identity, developmental stages



Anger - Happiness - Disgust
Surprise - Sadness - Fear

Social Factors

- Close relationships- friends, peers, families and partners.
- Gender and gender roles- androgyny.
- Prejudice, poverty and society.



Universal psychopathology?

- If psychopathology is part of the human experience then we should expect to see similar rates of pathology across culture.
- Different cultures refer to and categorize pathology differently (Murphy, 1976).
 - However, the disordered behaviour is universal.



Biological Treatments

- **Psychopharmacology**- psychotropic medications.
- 1 in 20 children (Olfson & Marcus, 2009)
- Antidepressants prescribed more than any other medication! (Cherry et al., 2007)
- 21% women on antidepressants and half that figure in men (Medico, 2011).
- Two antipsychotics (Abilify and Seroquel) 5th & 6th most prescribed meds in US (2011).

Psychopharmacology

- **ANTIPSYCHOTIC DRUGS** (neuroleptics). These dampen down 'psychotic' symptoms such as delusions and hallucinations. Chlorpromazine and clozapine block the neurotransmitter dopamine by binding to dopamine receptors. First generation typical drugs such as chlorpromazine have many side effects.
- Newer antipsychotic drugs such as clozapine have lower side effects. (Second generation atypical drugs).

ANTIDEPRESSANT DRUGS

- SSRI's- most commonly prescribed e.g. Prozac . These delay the reuptake of the neurotransmitter serotonin, thus raising levels in the brain. With more natural levels of serotonin in the brain, mood is elevated from the depressed state to a more normal state of mind. More recently we have seen the introduction of SNRI`s.
- Tricyclic drugs (because of the 3 ring chemical structure)- e.g. imipramine
- MAOI`s older drugs with many side effects and interactions with foods.

ANTI-ANXIETY DRUGS (Benzodiazepines)

- These slow down the activity of the CNS, by enhancing the activity of the neurotransmitter –GABA, the body's natural form of anxiety relief.
- Used to treat panic disorder (PD); Obsessive-compulsive disorder; Post-traumatic stress disorder (PTSD) Phobias. Possible dependence if used long-term and withdrawal reactions if stopped suddenly.

ANTIMANIC DRUGS

- LITHIUM CARBONATE or CARBAMAZEPINE if no response to Lithium.
- The first choice for mania with a lower relapse rate (Bauer & Mitchner, 2004)
- But 40% do not improve
- A problem with compliance
- A problem with switching between polars.

PSYCHOMOTOR STIMULANTS

- AMPHETAMINES such as-
- RITALIN
- DEXEDRINE
- Immediate improvements are seen, 75% of children have increased alertness and arousal to allow for focus.
- Double blind studies show efficacy (Barkley, 2006)
- Whilst they help behaviour, what about learning and attention?

Electroconvulsive Therapy

- 6-12 sessions over two weeks, 100vltS either bilaterally or unilaterally.
- Unilateral ECT less retrograde amnesia, but less effective (Lisanby et al., 2000).
- Only given with caution, under anaesthetic and only for severe depression.



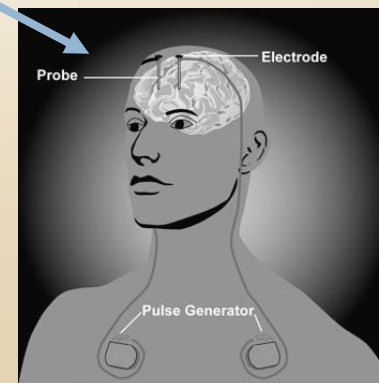
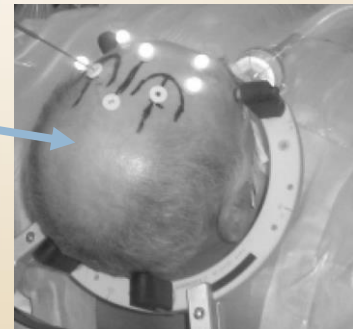
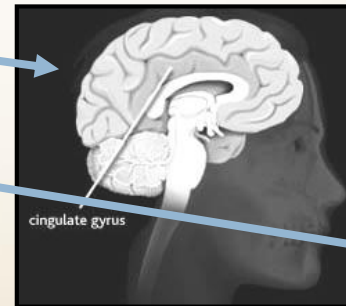
Psychosurgery

- Early Psychosurgery- Egas Moniz (1935) Destroyed nerve fibres in the frontal lobes which were involved in impulse control and mood regulation. Nobel Prize (1949) for the **prefrontal leucotomy**.
- Walter Freeman popularised the **transorbital lobotomy** during the 1940s and 1950s



Stereotactic Psychosurgery

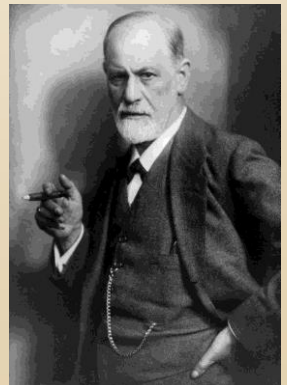
- More precise way of surgically treating mental disorders such as OCD, bipolar disorder, depression and eating disorders, and even for reducing chronic pain in cancer patients.
- Bilateral cingulotomy
- Capsulotomy
- Deep Brain Stimulation:
e.g. Vagal nerve stimulation
- TMS- Transcranial magnetic stimulation works in first few cm's to depolarise neurons



Treatment: Psychodynamic approach

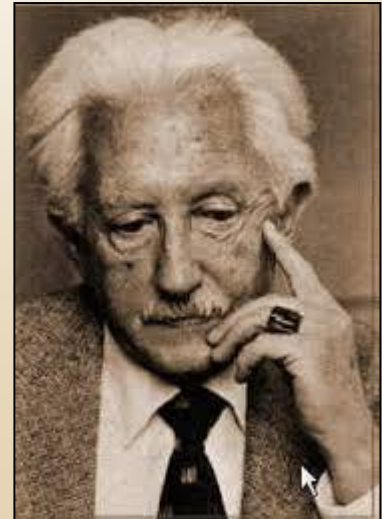
- Psychological problems are the manifestation of internal mental conflicts.
- Freud: Psychoanalysis
- Modern psychodynamic approach
 - Strupp & Binder: Transference, active listening.
- Therapy offers chance to observe disturbed relationships in a safe environment.

Sigmund Freud



Psychodynamic Psychotherapies

- **Ego Analysis-** Amongst others, Erik Erikson (1902-1994)
- Personality is not fixed by childhood experiences, but develops through predictable psychosocial conflicts throughout the lifespan.

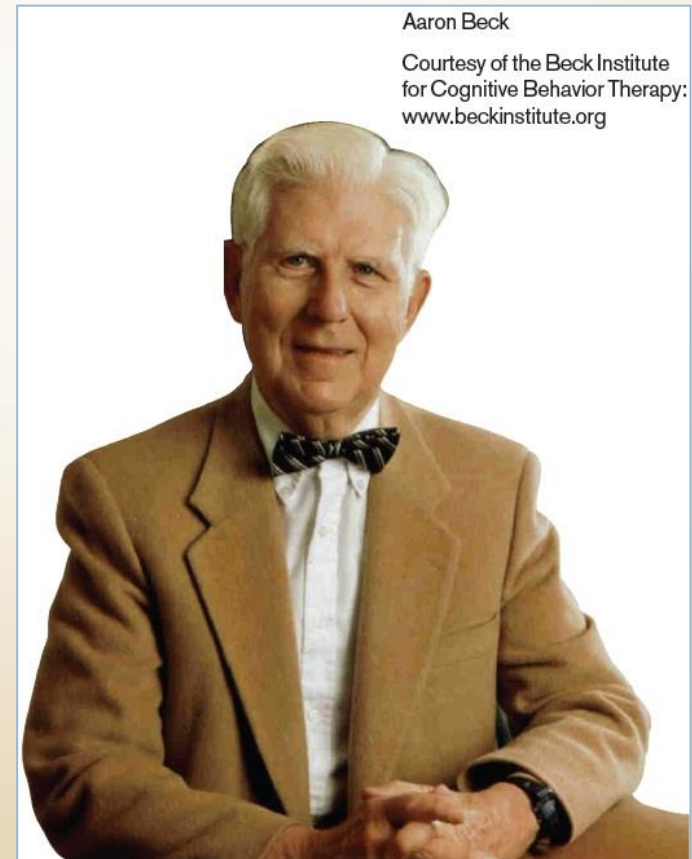


Interpersonal Therapy- IPT

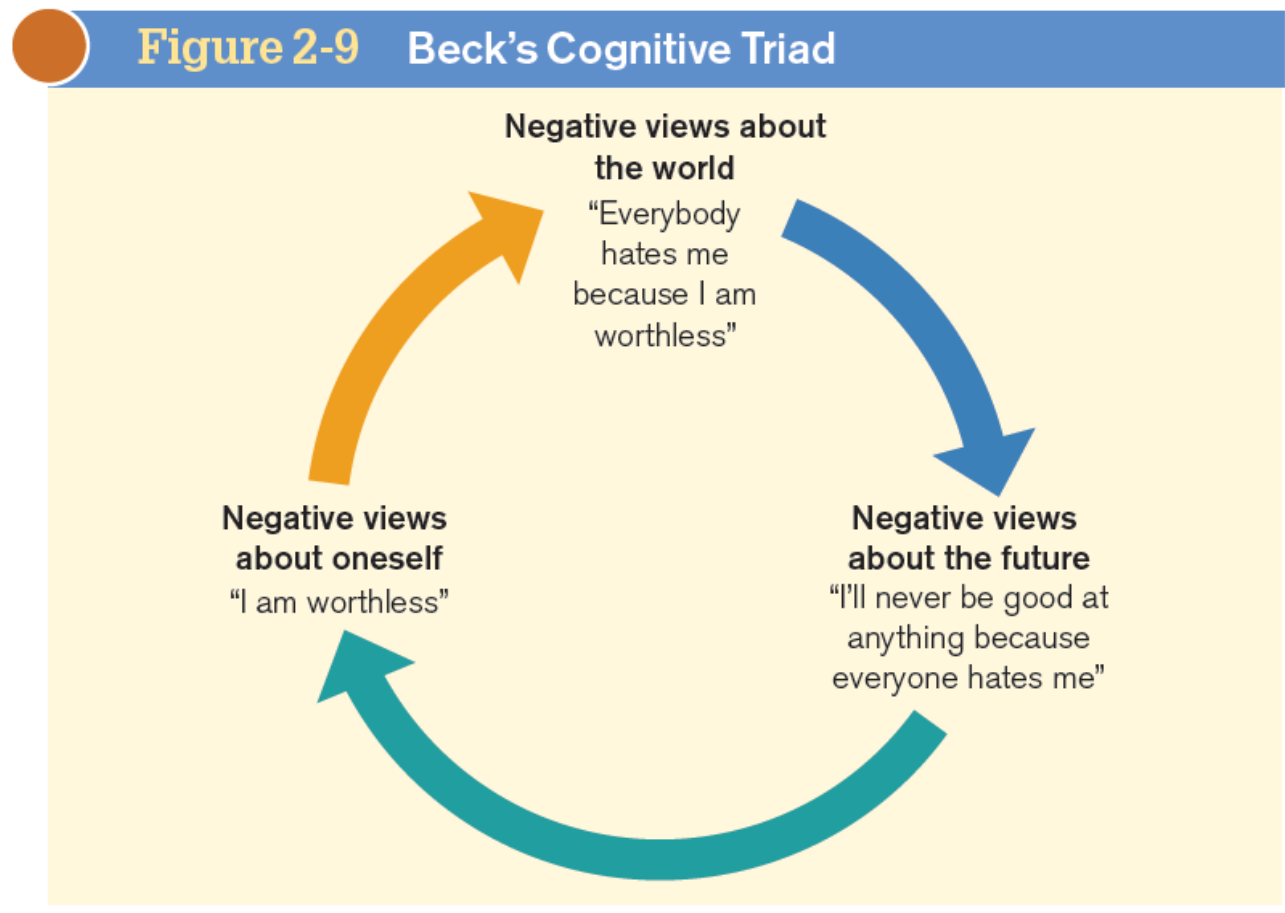
- Whilst psychodynamic therapies have not been studied extensively for their efficacy, one such type has-
- An evidence based treatment focused on changing emotions and styles of interaction in close relationships
- It views relationships as creating `styles` or `patterns` of responding and helps people recognise their own ways.

Cognitive Behavioural perspective

- Dysfunctional thinking underlies dysfunctional behaviour.
- Changing thinking can change behaviour.

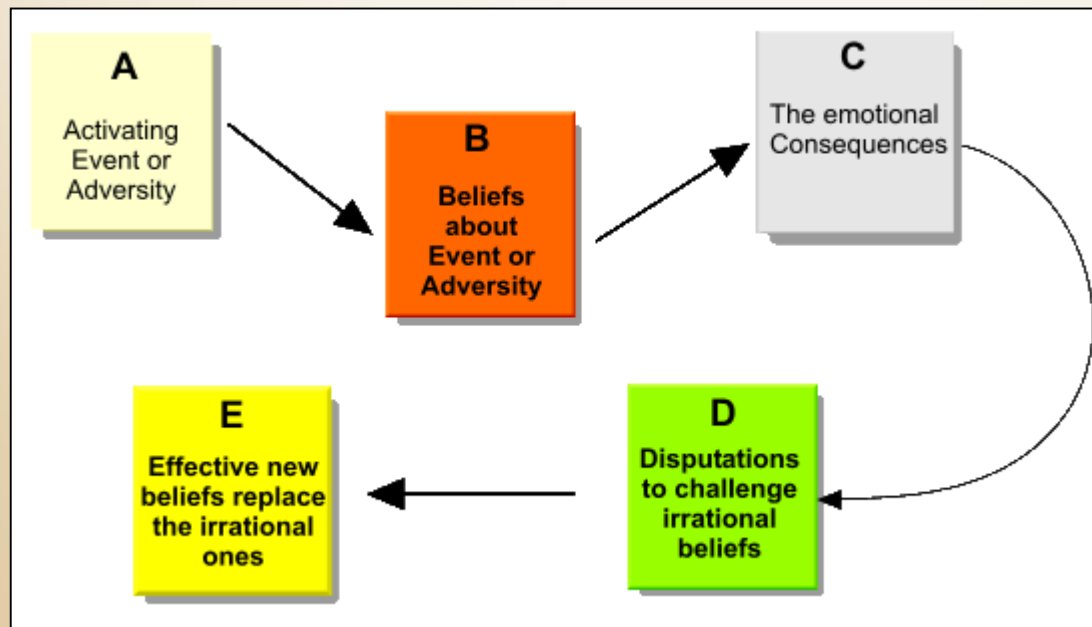


Beck's CBT for depression- faulty thinking



Cognitive-Behavioural Therapies- RET/REBT

- Ellis (1913-2007)- emotional disorders caused by irrational beliefs, the role of the therapist is to directly challenge these irrational thoughts.



Third wave CBT

- The focus is on broad principles of-
- Acceptance, mindfulness, values and relationships.
- **Dialectical Behaviour Therapy** (DBT)
- Currently being systematically evaluated (Ost, 2008)

4 Critical Skills to Learn From Dialectical Behavior Therapy

Distress Tolerance
Cope with painful events

Mindfulness
Experience the present moment

Emotion Regulation
Recognize feelings

Interpersonal Effectiveness
Set limits & negotiate solutions



Exposure Therapies

- **Systematic desensitization** (Wolpe 1915-1997) - fear eliminating technique with three elements
- 1. progressive muscle relaxation
- 2. hierarchy of fears
- 3. learning process



Two other ET's

- **In-Vivo Desensitisation**- gradually confronting fears in real –life whilst maintaining a state of relaxation
- **Flooding**- confronting fears at full intensity The CN tower
Canada

Aversion Therapy



- By creating an unpleasant response, the targeted behaviour should eventually decline.
- This is often used for drug, alcohol or nicotine addiction with the use of an emetic substance.
- Short term effects are good, but relapse is high (Finney & Moos, 2002).

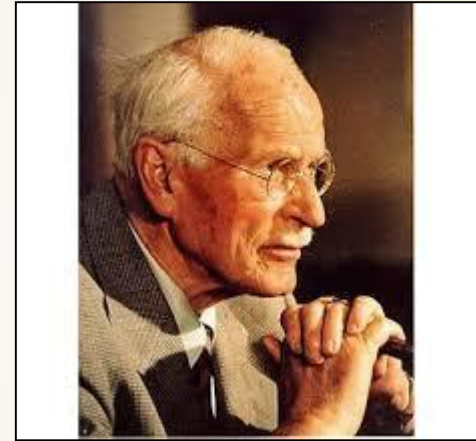
Contingency Management

- Changing rewards and punishments for specific identified behaviours- the contingency is the relationship between a behaviour and its consequences.
- Works best in a situation where the therapist has control over the individual.
- Works well in institutional settings, but doesn't readily generalise beyond the clinical setting.



Treatment: Existential Humanist Perspective

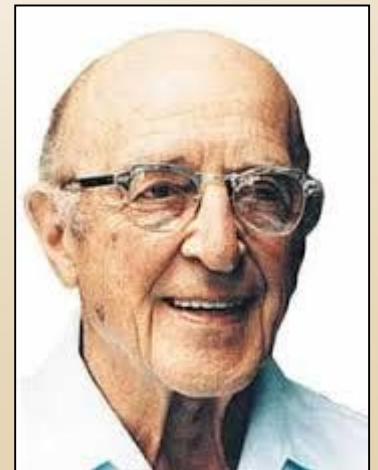
- What is the nature of the human experience?
- **Carl Jung**: Influenced by Freud and Darwin
 - Interested in interaction between instincts and environment
- **Karen Horney**: Influenced by Freud but wanted to develop approach that would also work for Women. Conflicting Ego needs of: Closeness, dominance and autonomy



Treatment:

Existential humanist perspective

- Client (person) centered therapy
- **Carl Rogers**
 - Interaction with the therapist facilitates self understanding.
- Three Characteristics:
 - Empathetic understanding
 - Unconditional positive regard
 - Genuineness and congruence



Treatment:

Other humanist perspectives

- Maslow's hierarchy of needs:
 - Biological needs must be met before psychological needs.
 - Survival first, then comfort and mental health.
- Greenberg: Emotion focused therapy
 - Emotion is central to the experience of self. Either adaptive or maladaptive.
 - Mindfulness techniques to explore our emotions.
- All Humanistic Therapies are not treatments per se, but rather a means to full emotional understanding

Psychotherapy- Does it work?

- 4 conclusions-
- 1. it can and does for some- but not all and not all problems.
- If it is going to work, it is usually rapid and improvements are seen in first few months (Howard et al. 1986).
- But average sessions are only 5 due to attrition.
- Affects are lost after 1-2 years.
- Addis and Mahalik (2003)- YAVIS



2. Successful treatments share 'active ingredients'

- Sloane et al. (1975)
 - therapeutic relationship
 - Social support from the relationship
 - The effects of social influence
 - Pain relief



3. Some forms of psychotherapy are harmful!...

(Castonguay et al., 2010)



4. There are different treatments for different disorders

- This relates to the aim of clinical psychology- to identify specific treatments for specific disorders, but we are a long way from this...(Baker et al., 2008)



Couple, Family and Group Therapy

- Couples- to foster COMMUNICATION and NEGOTIATION
- To resolve conflict, be direct, remove hidden agendas and develop ground rules.
- Beach et al. (1989) found couple therapy more effective than individual therapy alone.



Family therapy-

- Again via COMMUNICATION and NEGOTIATION with the purpose of changing relationships and roles within the family.
- Often used for parents having conflicts with their offspring. Parent Management Training- specific skills for dealing with children and adolescents. (Patterson, 1982).



Based on Systems Theory

- Viewing the individual within a system.
- In well functioning families parents form an alliance, whereas in dysfunctional families there are 'teams' across and within generations.
- When opposition occurs, leaders don't co-operate and problems occur. The goal is to facilitate co-operation. (Emery, 1992).

Group Therapy



- Why in groups?
- To reduce isolation, feeling weird, feeling alone.
- To allow people to breakdown 'facades' or barriers that we erect.
- Self help groups are popular too although not strictly therapy (Taylor & Luce, 2003).

In summary...

- Some disorders show 'spontaneous remission' (Eysenck, 1992)
- But... Lambert and Bergin (1994) most people have some form of 'unstructured therapy'.
- 50% of clinicians prescribe placebo's and they appear to work. Expensive ones work better than discounted ones!

Psychological formulation

- Last week we explored the problems associated with the use of the current classification and diagnostic systems.
- Psychological formulation is increasingly becoming popular as an supplement to the more traditional diagnostic approach.
- Partly as a result of service user – led organisations such as the 'Hearing Voices Network' (HVN) and Psychiatrists such as Suman Fernando, 'disorders' should be viewed as experiences rather than psychopathology.
- Thus, views on diagnosis are divided and many see formulation as a way forward. Rather than asking 'what is wrong with you?', formulation asks 'what has happened to you?'
- What is Psychological formulation?

What is Case formulation?

- An attempt to identify the processes that lead to/maintain specific behaviours...
- An explanatory hypothesis about the nature of an individual's problem
- It is guided by the theoretical perspective of the therapist
- It helps to create a treatment plan and enable the effectiveness of that plan to be evaluated
- Developed over the last 20 years and is preferred by those who do not view the psychiatric diagnosis as useful

A formulation involves inferences:

- About predisposing vulnerabilities, a pathogenic learning history, biological or genetic factors, sociocultural influences, currently operating contingencies of reinforcement, conditioned stimulus-response relationships, or schemas, working models, and beliefs about the self, others, the future or the world.
- The aim of the formulation is to explain the individual's problems and symptoms.

Why use formulation?

- The British Psychological Society views formulation as a core skill (Division of Clinical Psychology, 2001, p. 2).
- Multiple authors support the importance of case formulation as a "lynchpin concept" (Bergner, 1998), the "first principle" underlying therapy (Beck, 1995) and the "heart of evidence-based practice" (Bieling & Kuyken, 2003).
- Formulation is a core skill because, formulation is where theory and empirical knowledge about psychotherapy, psychopathology, personality, development, culture, and neurobiology merge to inform the understanding and treatment of an individual, group, couple, or family.
- Formulation provides a structure to apply nomothetic knowledge to an idiographic context.

An Integrative Approach

- The integrative model or approach acknowledges the role of psychological, social and biological factors in the origin and maintenance of mental illnesses.
- For many of the anxiety disorders, there is evidence of biological vulnerabilities and genetic pre-dispositions, which can be accounted for under the integrative approach.
- Likewise, for many of the psychopathologies there are psychological diatheses which can be considered using the integrative model. For example in OCD individuals often report perceptions of danger or contamination built around a general schema or core beliefs developed from earlier socialisation and parenting patterns.