

Introduction to Emotion

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Overview

- What is Emotion?
- Theories of Emotion
- Emotion and the brain
- Neural pathways
- Emotion and Psychopathology

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What is Emotion?

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What is emotion?

- Weak side of human nature?
 - Logic = Master, Emotion = slave
- Emotion as felt experience - Affect
- Primary emotions – Innate/Universal
 - E.g., happy, sad, fear, anger, surprise, disgust
- Secondary emotions – Learnt/Acquired
 - E.g., hope, optimism, love, justice
- Evolutionary – but distinctions between innate vs. acquired emotions not clear cut



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Theories of Emotion: Feeling James-Lang Theory (1884)

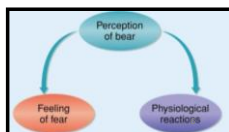
- Ψ theory based on philosophical theories
- Body reacts to situations (e.g., danger) with bodily responses (inc. breathing, heart rate, etc.)
- Different emotions = result of body reacting differently - Each emotion is perception of physiological response



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Theories of Emotion: Cognition Cannon-Bard Theory

- Walter Cannon (1929): was studying 'emergency reactions': fear, pain
- Autonomic Nervous System (ANS) activated in many emotions and in uniform way in anticipation of action, rather than reaction
- We feel emotion before ANS kicks in, suggesting James is wrong



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Theories of Emotion: Cognition

Cannon-Bard Theory

- Certain physiological states can affect > 1 response

- **Dutton and Aron (1974):**

- Asked men to tell story to attractive woman whilst either standing on safe ground or an (unsafe) bridge
- Stories from unsafe bridge had higher sexual content, due to arousal from danger



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Combination Theories:

Appraisal

- Arnold (1960): concerned with missing piece of puzzle
 - What causes reaction in first place?
- Appraisal process enables analysis of situation
 - E.g., Anger often result of being offended
 - Offence requires evaluation of situation and can involve cultural norms and values
 - In Inuit culture, displays of anger rarely seen (Briggs, 1970), so anger unlikely to be simple bodily reaction



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Appraisal Theories

- For Arnold (1960): appraisal produces action tendency (bear → run)
- Feeling is the outcome of this process
- It is unconscious as it happens
 - But can reflect on process after to examine what happened



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Appraisal Theories



- Appraisal considered central process in emotion theories
- Feelings influence, and are influenced by, cognitions (Forgas & Smith, 2003; Haddock & Zanna, 1999; Smith & Lazarus, 1990)
- **Top-down** processing plays crucial role

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Appraisal Theories

• Smith & Lazarus (1990)

• Primary appraisals

- Relevance of situation to needs/goals?
- Is it congruent to needs/goals?



• Secondary appraisals

- How responsible am I for what is happening?
- How responsible is someone/thing else?
- Can I act on situation to make it or keep it as I want?
- Can I handle/adjust regardless of how it turns out?
- Do I expect situation to improve or get worse?

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Evidence for non-conscious emotional processing

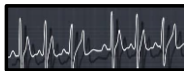
• Information processed below level of conscious awareness can produce emotional reactions:

• Öhman and Soares (1994):

- Snake/spider phobics shown pictures rapidly they could not identify them consciously.



- Displayed greater physiological response to snake/spider pictures than flower/mushroom pictures.

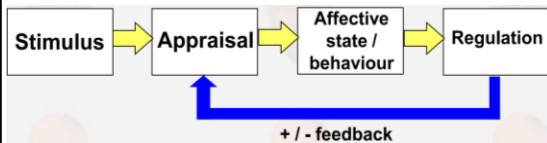


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Appraisal Theories

• Phillips et al. (2003a): reviewed neurobiological studies & argued for 3-stage model after stimulus

1. Appraisal/identification of stimulus
2. Production of affective state in response - ANS, neuroendocrine, motor responses and conscious feeling
3. Regulation: experience, expression/action modified to be contextually appropriate



Regulation stage allows understanding affective disorder within normal model of emotion

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Neural Pathways to Emotion

• Phillips et al. (2003) argue for two neural systems

- **Ventral system** – involved in appraisal and production of affective state stages
 - Amygdala, insula, ventral striatum, ventral regions of the anterior cingulate cortex
- **Dorsal system** – involved in regulation stage
 - Hippocampus, dorsal regions of the anterior cingulate cortex and prefrontal cortex

Amygdala:

Key area for emotion processing in the brain

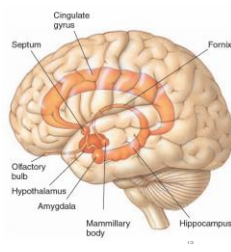


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The Limbic System

Papez (1937): emotional circuit working together to influence cognition and emotion.

- Emotional expression controlled by interconnected nuclei and tracts forming ring around the thalamus.
- Emotional states expressed through action of circuit structures on hypothalamus and emotion is experienced through action of structures on cortex.



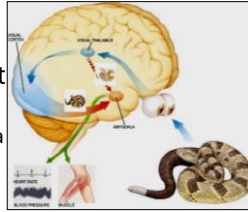
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Neural Pathways to Emotion

LeDoux (1998): two pathways in processing of fear.....

• Fast route, quick, instant inaccurate, life saving:

- Sight → Thalamus → Amygdala
- Can lead to false positives



• Slow route, precise, complex, sluggish:

- Sight → Thalamus → Visual cortex → Amygdala
- Reduces fear response if situation deemed safe

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Damasio et al. (1994)

• Damasio links secondary emotion with orbito-frontal / ventromedial cortex (behind eyes)

➤ Phineas Gage suffered severe emotional disturbance after damage to OFC in 1848



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Damasio (1994) on Emotions

• Distinguishes feelings and emotions.

• Emotion = bodily reaction to mental states but

• Feeling requires joint perception of:

- causative object, ensuing emotional state, related thought that follows
- Arousal will not result in emotion unless context to reflect on (e.g., Schacter & Singer, 1962)

• 'Pre-feeling' emotion arises from bodily feedback, or simulated feedback in brain's somatosensory maps.

• Basis of 'gut feelings' - 'Somatic marker hypothesis'

- Not popular with all - Rolls (1996): it is a "weakened version of James-Lange theory from last century"

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Emotion and Psychopathology

Phillips et al. (2003b): reviewed research on function of neural pathways for emotion in different psychiatric illnesses.

- Specific impairments have direct causal link with specific symptoms
- However, emotion involved in disorders which at may not seem to have obvious emotional pathology



E.g., Capgras Delusions: delusion that (usually) spouse/family replaced by identical impostor

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Capgras Delusions

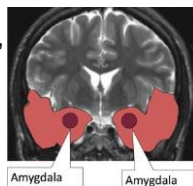
- Ellis et al. (1997) measured skin conductance when people with Capgras viewed familiar faces
 - Despite consciously distinguishing between familiar and unfamiliar faces...
 - Showed no difference in emotional arousal
 - Suggests they have impaired unconscious emotional response to familiar people
 - May be why they believe them to be impostors - *"They look like them, but I feel as if they are not"*



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Kluver-Bucy syndrome

- Monkeys with anterior temporal lobes removed showed unusual behaviors
- E.g., wanting to eat everything, increased sexual activity, investigate familiar objects, putting objects in their mouth, and lack of fear.
- Most symptoms from amygdala damage.
- Seen in humans with brain infection.



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Summary

- James-Lange: emotion = physiological responses to situations
- Cannon-Bard: physiological responses arise from emotions
- Arnold: appraisal processes and regulation
- Two neural routes to fear response
 - Secondary emotions take more complex route
 - Impairment to routes play role in psychopathology
- Understanding social, cognitive, neurological/physiological factors are major challenges facing modern social/cognitive psychology
- What is emotion?
 - Contains*: – instigating event, interpretation and appraisal of interpretation, that is causal of physiological change and state of potential for action – Conscious experience of components (Power & Dalgleish, 2016).
 - *each is subject to debate

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