The Emotional Brain
Emotions: Why do we care?

Emotions impact our decision making skills
Emotions: Why do we care?

Emotions impact our decision making skills.

Think about patients with frontal lobe injuries – they have impaired emotions and disturbances in moral judgment.
How emotions shape our experiences

Question posed in lecture on Tuesday:

Should emotion be our guide with morals?

• The Damasios seem to think YES.
Before we can speak about anything advanced, we must mention our primitive brain.
Neuro Web Design: What Makes Them Click?
By Susan Weinschenk

The old brain is organized to think about YOU, your protection and safety
This is a non conscious process

- Sex
- Danger
- Food
LOVE
Do we have the power to choose who we love?
The chemistry of love
4-8 minutes
Neurotransmitters involved in love

Dopamine

Movement, emotion, motivation, feelings of pleasure, ability to focus
Neurotransmitters involved in love:

**Serotonin**
- Mood
- Appetite
- Sensory perception
- Sexual desire
- Sleep
In terms of physical attraction, how does our brain decide what we find appealing?

https://www.youtube.com/watch?v=DONT6xjX1q4
Testosterone

The ‘male hormone’

Important for creating male sex organs

Associated with muscle mass and strength, typical “masculinity”
Estrogen

Critical for the development of female sex parts

Ideas of “femininity” associated with estrogen

Goes back to primitive brain areas: men desire women who are seen as most ‘fertile’ so that their lineage will be passed on
Okay, enough about sappy love. What about our family members?
Moms and their babies

I used to have functioning brain cells, but I traded them in for a child.
How does a mother’s brain change?

When mothers breastfeed, there is release of the hormone **oxytocin**

This hormone is associated with:
- Relaxation
- Trust
- Psychological stability

Which may explain why mothers feel so closely bonded to their babies after breastfeeding.
So is love part of our free will, or is it all a physiological basis?

As Baars would like to say—
“We don’t have free will, it’s all due to these funny little cells firing in our heads”

Could this be extended to hormones?
HATES PEOPLE
GETS LONELY
Coaction of genes and environment to create behavior

Nature and Nurture?

MAO-L
Low activity
(higher intracellular concentration of 5-HT)

Increased serotonin availability is frequently associated with anxiety — therefore, MAOA-L carriers could have a predisposition toward neural hyper-reactivity to a threat and environmental maltreatment.

“Genetic vulnerability to violence by MAOA-L only in the presence of environmental trigger of maltreatment.”

Viding and Frith (2006) PNAS vol. 103 no. 16 6085–6086
People respond to the strongest emotional stimuli from their childhoods
VIOLENT HOMES HAVE THE SAME EFFECT ON CHILDREN'S BRAINS AS COMBAT ON SOLDIERS.
This may happen for survival purposes: children need to know when to recognize that they are in danger.
PAIN

The brain has no pain receptors, so it can technically feel no pain

But....
CAN'T PHYSICALLY FEEL PAIN

MAKES PAIN RECEPTORS SO YOU CAN
What is the evolutionary purpose of pain?

Think DANGER

Pain creates a boundary between what we want to do and what we are actually able to do.
Interaction between mental mind and physical body

THE BRAIN TREATS REJECTION LIKE PHYSICAL PAIN, ACCORDING TO SCIENTISTS.
Mental mind, physical brain

This is a perfect example of the relationship between the “mind” and the “brain” – in terms of the way pain is mapped out onto the brain, emotional pain and physical pain are indistinguishable when examining what happens to the brain.
Mental health is getting more attention for this very reason—just because it can't be seen, doesn't make the pain any less real.
A little blurb about SLEEP
The dynamic 3 in college

College Life

GOOD GRADES

you can only

CHOOSE TWO

SOCIAL

LIFE

ENOUGH

SLEEP
But what affect does this have on our brain and mental, and physical wellbeing?

Lack of sleep leads to:
- Worsened mood
- More aggressive behavior
- Neurons losing their plasticity, ability to learn affected
Amygdala

Controls emotions

Negatively affected by lack of sleep:

People who sleep less are more likely to respond more violently to adverse stimuli in their environments
This is your brain on cookies.
Sugar

Addiction lecture → sugar has similar affects as drugs of abuse

Studies done on mice between cocaine and sugar - the mice end up choosing sugar over cocaine!
Dose response curve
What happens over time

**DOSE RESPONSE CURVE...**

- Initial dose-response curve
- Dose-response curve after drug exposure
MUSIC TRIGGERS ACTIVITY IN THE SAME BRAIN STRUCTURE THAT RELEASES THE "PLEASURE CHEMICAL" DOPAMINE DURING SEX AND EATING
Talking about addiction and habits,

Do we truly have free will once an addiction or habit is cemented in our minds?

Think midterm #2 😊
Brain parts
Hypothalamus
Hypothalamus

- Produces most of the body’s hormones

- These hormones go on to regulate our emotions and the way we perceive the world

- Govern physiologic functions such as temperature regulation, thirst, hunger, sleep, mood, sex drive
These hormones, as we know, ultimately affect who we LOVE or hate or are attracted to.
Anterior cingulate cortex
Anterior cingulate cortex

This particular brain area is associated with:

- Error detection
- Anticipation of tasks
- Attention
- Motivation

- Modulation of emotional responses
So you can see how different higher thinking abilities are connected, such as motivation and emotions.

- Ultimately, it all comes down to the coaction between our mental AND physical wellbeing.
Addiction and free will: Dennett

“I wouldn’t have free will if I were obsessive, or were an addict.....then my free will would be pointless”

OCD → emotions and our brains

https://www.youtube.com/watch?v=vnKZ4pdSU-s
To stay healthy, don’t forget to tend to both your mental and physical wellbeing!