



It's all about the body

A clear example: Stress





Stress...

- You know what it is... How would you define it?
- Richard Lazarus
 - Perception that personal challenges exceed one's capacities and resources
- Adaptive response
 - Produces
 - Vigilant attention
 - Stimulation of SNS
- Chronic stress -- is dangerous



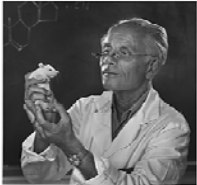
Is stress an emotion?

- You tell me... is it?
- Involves fight/ flight response
 - Assessors
 - Immediate life & death threats
 - When its over, its over
 - Modern stressors differ
 - Economic problems/ computer problems/ relationship juggling
 - Perse over long periods
 - Our bodies react the same way ...

Stress (and rats... again)

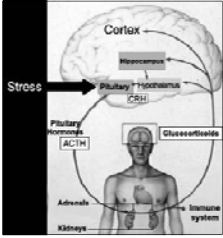
- Hans Selye
- Studying cancer agents in rats
 - Exposure and control rats both developed cancer
 - Only exposure rats when assistant did injections
- Selye's injections 'stress inducing'
 - Found similar results for prolonged heat or cold, pain, enforced activity, or fearful stimuli, like cast or more aggressive rats
- General Adaptation Syndrome (Stress)
 - Alarm: aroused SNS in response to stressor
 - Resistance: prolonged moderate arousal
 - Adrenal glands secrete cortisol and epinephrine/ norepinephrine
 - Exhaustion: with ongoing/ severe stressors
 - Weakness/ fatigue/ lack of interest
 - Immune system less active



Hans Selye
Canadian Physician, 1907-1982
'Discovered' stress

Stress & Health

- Thousands of studies
- Death of a spouse
 - 40-50% higher probability of also dying
- First year of college
 - Higher probability of developing health problems
- Long Hours & Job stress
 - Hypertension & Diabetes
 - Virus induced cancers/ lymphoma
- What the heck is this about?
 - Low control
 - Low predictability
 - Few outlets for frustration
 - Interpretation of stressor
 - Low social support



Short and Long Term Stress

- Hypothalamus
 - Stimulates Pituitary
- Pituitary
 - Releases ACTH to stimulate Adrenals
- Adrenals
 - Releases cortisol
- Acute/ Moderate reaction
 - Enhances metabolism & availability of fuels
 - Drives up blood sugar/ release of protein
 - Stimulates immune system/ decreases appetite & sex drive
- With lengthy stresses
 - Enter exhaustion stage
 - Immune system weakens
 - Causes damage to hippocampus
- Let's take a look at this...

Acute Stress

- SNS responses
- Fades when no longer needed

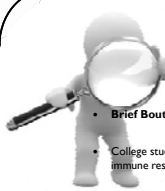
Prolonged Stress

- Resistance system kicks in
- HPA kicks in -- slower but lasts longer

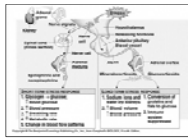
Very Prolonged Stress

- Exhaustion in system
- HPA is overworking
- Body reacts with slowed & toxic reactions

A closer look




- Brief Bouts of Stress**
 - College students at exam time – increased immune response
 - Rats/ inescapable shock – slept less, decrease appetite
- Longer term stress**
 - Type A personality/ prolonged hostility
 - Prolonged anxiety, anger, depression
 - Risk of heart disease – chronic activation/ mechanical damage
 - Daughters of breast cancer patients/ caregivers for Alzheimer's/ natural disaster victims
 - Elevated cortisol levels/ decreased immune function
 - Poorer health
 - Elevated Cortisol
 - Reduces production of new neurons in hippocampus
 - Shrinks dendrites & interferes with repair process




What can be done?

Engage the PSNS


- Stress reduction
 - Addresses SNS via physical route
- Social support
 - Calms and eases
 - Addresses SNS via social route



Interesting studies

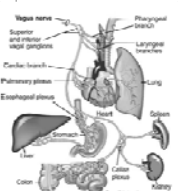


- Robert Sapolsky**
 - Summary
- Studies of social rank and health in baboons
 - low ranking animals**
 - Less access to food/ grooming/ displaced aggression
 - Stress response: higher baseline stress response & slower post stress recovery
 - Damaged cardiovascular systems
 - Suppressed sexual function (loss of ovulation & reduced testosterone)
 - Effects are elevated when**
 - Dominance hierarchies are unstable
 - Personality of the ape is hostile
 - Effects are reduced when**
 - Social support from kin or mates is available



Opposite of Stress...

- SNS activates during negative emotions
- Does PSNS activate during positive?**
- Active during attachment & affection
- Higher resting PSNS - more positive mood
- Vagus Nerve – lowers heart rate/ BP**
 - Can be activated with regulated breath
 - Stimulates amygdala; strengthens memory pathways
 - More vagal nerve response – better emotion regulation
 - Vagal stimulation speeds weight loss



Viva La Vagus!!

- Vagus nerve stimulation**
 - Leads to biological calming/ associated with positive moods
 - Suggested as a possible treatment for depression
 - Also used in treating epilepsy
- Blocking stimulation (Vblock)**
 - Possible treatment for bulimia/ obesity/ ulcers
 - Disrupts stimulation of V. nerve
 - Reduces appetite and absorption of calories
 - Reduces production of gastric acids

