BOĞAZİÇİ UNIVERSITY
SUMMER TERM

PSY 101
Stress, coping mechanisms and health

by Dr. Oytun AYGÜN

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Who is in the class ?

…and Why?

In a scale of 1-10 how much do you want to be here?

How do you think this class can help you in life?

Let’s Begin

…with breathing

“I'm stressed out”

“I’m feeling stressed”

“You stress me”

“I’m under a lot of pressure”

“I am freaking out”

“My heart is racing”

What are some of the things you say when you are stressed?

What is STRESS?

No simple definition, a combination of the following:

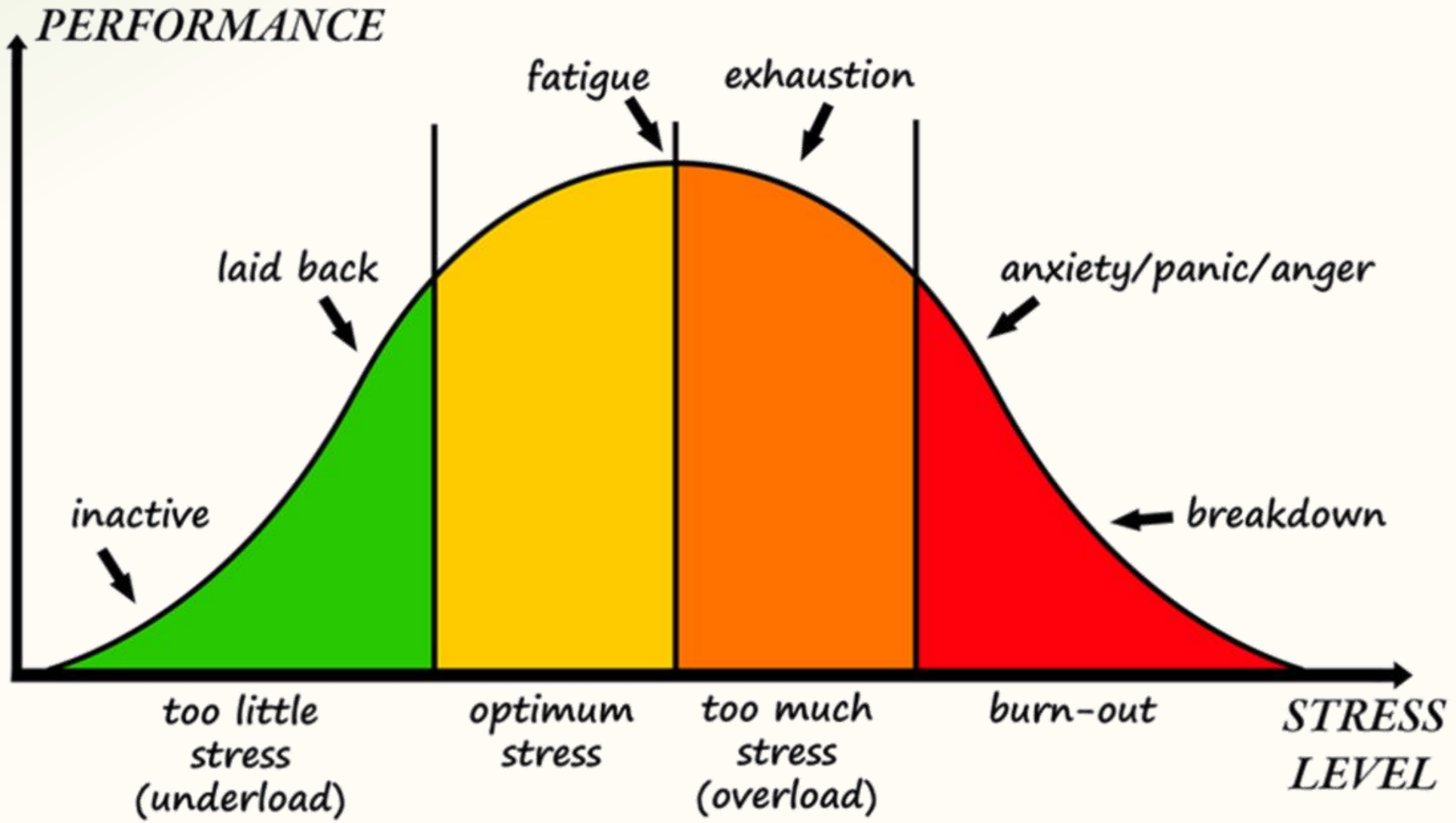
- A bodily or mental tension resulting from factors that tend to alter an existent equilibrium.
- Experiencing events that are perceived as endangering one's physical or psychological wellbeing.
- A response to events that are threatening or challenging.
- Stress is a personal & subjective

Stress

- Eustress – Positive stress (concept still developping)
  - adaptive nature of the reaction to the stress
  - a positive cognitive response to a stressor.
  - associated with positive feelings and a healthy physical state
  - excitement
  - better performance

- Distress – Negative stress (commonly meant when we say “stress”)
  - negative consequences on health and performance

STRESS CURVE



Question: What are the stressors in your life?

Stress shows itself in different ways in different people

Some categories to consider:

- Financial
- Health
- Education / academic
- Relationship
- Future stress
- Internal

Any eustress?

Major stressors?

Some stress symptoms

Some physical symptoms

- Muscle tention
- Bowel
- Insomnia
- Grinding teech
- Change in apatite and weight

Some Psychological symptomes

- Feeling overwhelmed
- More pessimistic
- Less motivation
- Impaired concentration
- Worry / anxiety
- Being less patient

Conceptualization of stress

The classical views of stress

1- environmental stress, or stressors : *Due to objective characteristic of the environment (Dohrenwend, Dohrenwend, Dodson, & Shrout 1984)*

2- individual stress, or a state of the organism : *Function of the subjective personality characteristics, such as neuroticism (McCrae, 1982)*

3- stress as resulting from a transaction between the individual and the environment (Mason, 1976) : *The interaction or transaction between the individual and the environment (Lazarus & Folkman, 1984).*

Does stress comes from the environment ?

1- Stress originates from the environment, environmental stimuli as stressor:

- Stress as originating in the external environment, due to objective characteristic of the environment (Dohrenwend 2000, Monroe & Roberts 1990).
- Environmental conditions are more or less likely to be stressful for the average individual, that stress is a probabilistic feature of particular environmental conditions.
- Psychobiological response of the organism to differing environmental challenges (e.g., the fight-or-flight response) (Selye 1936, 1976; Weiner 1992).
- The environmental conditions eliciting the stress have been termed stressors (Selye 1976).

Does stress come from the individual?

2- Individual as the subjective source of stress, it is a state of the organism:

- Function of the subjective personality characteristics, such as neuroticism (McCrae, 1982)

Stress due to interaction of individual & environment

3- Stress as resulting from a transaction between the individual and the environment (Mason, 1976) :

- The interaction or transaction between the individual and the environment (Lazarus & Folkman, 1984).
- There are individual differences in appraisals of stress that nonetheless reflect environmental contingencies (see Aldwin, 2007).

Current view on Stress : The transactional model of Stress

- Stress results from a transaction, the interaction, between the individual and the environment (Mason, 1976; *Lazarus & Folkman, 1984).*
- Appraisals of stress arise when environmental demands exceed the individual's resources, especially in situations that are personally significant (Lazarus & Folkman, 1984).
- Stress is an intrinsically interactive and dynamic concept (Lazarus & Folkman 1984, Weiner 1992): The particulars of the organism, the environment, and time are all key elements of the concept.

The transactional model of Stress

- Stress as an ongoing relationship between organism and environment (Weiner 1992) or as the successive transactions between the organism and environment over time (Lazarus & Folkman)
- Stress is a result of external challenges and perceptions of these challenges, coping resources and perceptions of coping resources, and the dynamic interplay of these over time (Cohen et al. 1995b, Gunnar & Quevedo 2007).

Complexity of stress

(*a*) Allostasis and allostatic load

- In response to environmental changes and challenges, the organism maintained stability of key biological functions through homeostatic regulatory mechanisms.

(*b*) Psychological appraisal

Homeostasis:

Homeostasis : In response to environmental changes and challenges, the organism’s ability to maintain stability of key biological functions that sustain life, that must be kept within certain limits (e.g., body temperature, pH balance).

Allostasis

- Allostasis: How the organism achieves stability (or homeostasis) through continual change. It is a more encompassing concept, incorporating an extensive range of whole-organism mechanisms recruited to meet environmental demands, all of which have more flexible set points designed to accommodate constantly changing environments and regulatory challenges (McEwen & Wingfield 2003, Sterling & Eyer 1988).

Allostasis

1. Allostasis allows ongoing evaluation of the match between internal resources and external demands.

2. Allostasis permits the organism to produce physiological adjustments in advance of need through anticipatory arousal.

3. Allostasis allows the organism to adapt to circumstances over time.

4. Allostasis predicts the responses of an alert, intact organ- ism existing in a changing ecological framework.

Allostasis and the Brain

- **Brain** as the primary mediator of allostasist
- Primary interface between a given stressor in its physical and social context and an individual's physiological and behavioral accommodation to that stressor.
- Core emotional regions of the brain constitute the primary regulators of allostatic accommodation

(Ganzel et al., 2010).

Allostatic load

- In allostasis, the new balance of system parameters that follows stressor exposure comes at a physiological cost called **allostatic load** (McEwen and Stellar, 1993).
- The consequences of sustained activation of primary regulatory systems for allostasis over time, to the cumulative burden on bodily systems that is believed to contribute to disorder and disease.

Allostatic load and stress

Allostatic load

- This cost can occur through “fixed automatisms,” that is, physiological changes that do not revert to the way they were when the challenge has passed (Sterling and Eyer, 1988)
- Helpful in the short term (as with the increases in blood pressure) but may have negative long-term consequences for the organism (e.g., increased wear and tear on the heart).

→ The concepts of allostasis and allostatic load explain stress processes adaptive over the short run and maladaptive over more pro-longed periods of time.

Allostatic load

- This cost can also come through damage due to overproduction of the neurochemicals involved in the stress response, some of which are toxic.
- For example, persistent high concentrations of cortisol (stress hormone) can cause damage to regions of the hippocampus (e.g., Sapolsky, 1984; Uno et al., 1989) and inhibit neurogenesis in this region (Gould, McEwen, Tanapat, Galea, & Fuchs, 1997) → potentially interfere with cognition and future adaptation to stressors.

Let’s Begin

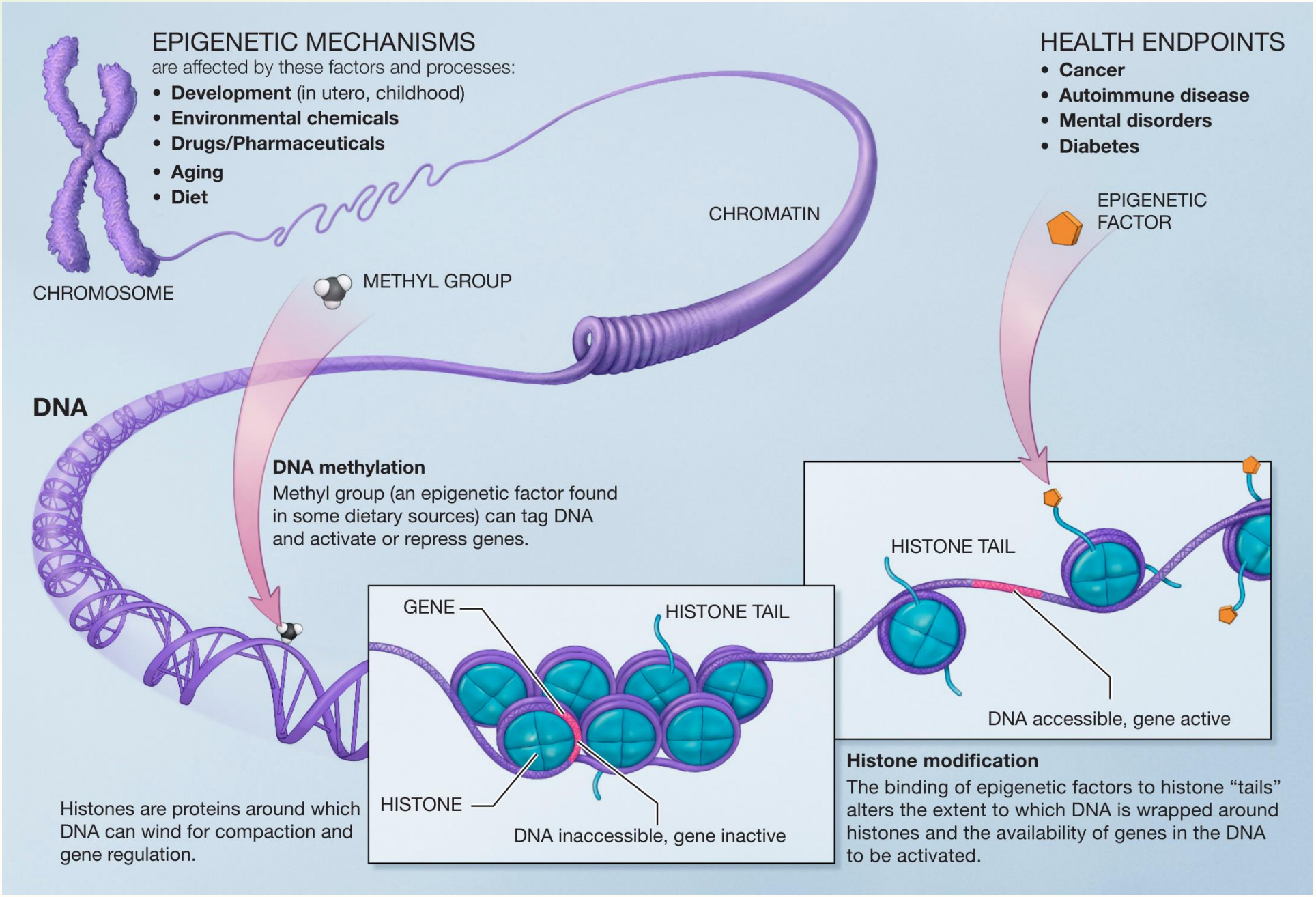
…with breathing

Nature AND Nurture (remember this)

- Today, the explanatory systems of development and psychology are based on models **interactionist theories:** interaction between biological and environmental factors (epigenetic models).
- Emphasis is placed on the individual resulting from biological characteristics and previous experiences, analysis of inter-individual differences: individual characteristics influencing early interactions, the development of attachment, self-confidence, motor, cognitive, social and emotional development.

HOW?.. EPIGENETICS

- Epigenesis: from the Greek épí, “above/on the surface” of the genes
- GENETICS = study of genes and the phenotypic traits associated with them
- **EPIGENETICS** = study of molecular mechanisms, which modulate the expression of genetic heritage depending on the context Idea that the expression of genes is **not automatic.**


EPIGENETIC MECHANISMS
are affected by these factors and processes:
• Development (in utero, childhood)
• Environmental chemicals
• Drugs/Pharmaceuticals
• Aging
• Diet
HEALTH ENDPOINTS
• Cancer
• Autoimmune disease
• Mental disorders
• Diabetes
CHROMOSOME
CHROMATIN
METHYL GROUP
EPIGENETIC FACTOR
DNA
DNA methylation
Methyl group (an epigenetic factor found in some dietary sources) can tag DNA and activate or repress genes.
GENE
HISTONE TAIL
HISTONE
DNA inaccessible, gene inactive
HISTONE TAIL
DNA accessible, gene active
Histones are proteins around which DNA can wind for compaction and gene regulation.
Histone modification
The binding of epigenetic factors to histone "tails" alters the extent to which DNA is wrapped around histones and the availability of genes in the DNA to be activated.

HOW?.. EPIGENETICS

EPIGENETICS Epigenetics TEDx

- We now speak no longer of genetic determinism, but of susceptibility genes: depends on the context, the environment and experience.
- Explains that traits can be acquired, passed on from one generation to another, or lost after being inherited.
- Our behavior/environment acts on the expression of our genes.
- Applications in a wide range of biological disciplines (e.g. cancer research) with new therapeutic perspectives.

Epigen Dev

The transactional model of Stress

- Stress as an ongoing relationship between organism and environment (Weiner 1992) or as the successive transactions between the organism and environment over time (Lazarus & Folkman)
- Stress is a result of external challenges and perceptions of these challenges, coping resources and perceptions of coping resources, and the dynamic interplay of these over time (Cohen et al. 1995b, Gunnar & Quevedo 2007).

Complexity of stress

(*a*) Allostasis and allostatic load

- In response to environmental changes and challenges, the organism maintained stability of key biological functions through homeostatic regulatory mechanisms.

(*b*) Psychological appraisal

Psychological appraisal

→An individual's interpretation of the stressor and their ability to cope with it

- Psychological processes intervene between the environmental event and the organism's response (Somerfield & McCrae 2000).
- Appraisal of stressful situations and coping resources are of central significance for moderating how environmental challenges could affect psyche and the body.

Appraisal

Appraisal could could influence in two ways (Kanner et al. 1981) :

- The impact of very stressful events could be attenuated,
- The impact of more minor stressful events could be amplified

Appraisal video

→ explain why some people suffer more under stress than others.

- Appraisals determine how an individual chooses to cope with the stressors
- Individuals typically use multiple appraisals (Aldwin, Sutton, Chiara, & Spiro, 1996; Boeninger et al., 2009).

Appraisal

- Individuals are constantly appraising stimuli within their environment.
- This appraisal process generates emotions, and when stimuli are appraised as threatening, challenging, or harmful (i.e., stressors), the resultant distress initiates coping strategies to manage emotions or attempt to directly address the stressor itself.
- It is the perception that the event is stressful, rather than the event itself, that determines whether coping strategies are initiated and whether the stressor is ultimately resolved (Lazarus, 1991; 1999).

Stress response

- Stressors: are the events that cause the stress (e.g., car accidents, wars, exams...etc.).
- Stress response: people's reactions to the stressors.
- Coping: how to mitigate the harmful effects of stress.
- Efforts to control, reduce, or learn to tolerate the threats that lead to stress are known as coping.
- Well-being and resilience in the face of stress

- National Geography summary video on Stress effects

- **Huberman video with Sapolsky**
- In the beginning from 7.. and… 42 onwards
- Stress Video
-

In sum

- Integration of social and biological approaches to stress
- Stress as an ongoing relationship between organism and environment
- Transactions between the organism and environment over time (Lazarus & Folkman)

Let’s Begin

…with breathing

Types of stress

- Stress can be classified in terms of its **severity** (degree) and **duration** (acute or chronic)

- **Physical stressors** & **Psychological stress**

Trauma

- **Trauma** refers to severe and unexpected stressors that involve the threat of or witnessing deaths or severe bodily injury. Eg. An accident, earthquake

Travma Presentation – Oytun Aygün

Chronic Stress

- Chronic stress is generally defined as “an ongoing problem located in the structure of the social environment” (Wheaton, 1996, p. 57), but can also include individual stressors such as chronic illness.
- Threats of the possibility of harm; long-term, unresolved conflicts; long-term uncertainty, eg. are poverty, abusive family situations, poor working conditions (Pearlin & Schooler, 1978).

Chronic Stress : daily stressors

- Daily stressors, or “hassles”
- May be minor and of relatively short duration eg. traffic jams or arguments with friends and family, but may also reflect chronic problems, such as ongoing family problems (Conger & Conger, 2002) or living in an impoverished environment (Evans, 2004).

Types of stress : Physical stressors

- Physical stressors: pose a direct threat to our physical well-being.
- E.g., cold, heat, infection, toxic substances , illness

Types of stress: Psychological Stress

- When an individual perceives that environmental demands exceed his or her adaptive capacity.
- Occurrence of environmental events that judged as exceeding one's ability to cope.
- There is an overload, thus individual perceives stress and event-elicited negative affect.

What are some of the Physical stressors in your life?

What are some of the Psychological stresses in your life?

How do you experience them?

Physiological signs? Cognitive signs? Emotional signs?

Trauma

- **Trauma** refers to severe and unexpected stressors that involve the threat of or witnessing deaths or severe bodily injury. Eg. An accident, earthquake

Travma Presentation – Oytun Aygün

Effects of Stress

- Negative events that are associated with poor health outcomes (Zautra, 2003).

Physical effects of stress

- Generally, stressful events are thought to influence the pathogenesis of physical disease by causing negative affective states (eg, feelings of anxiety and depression), which in turn exert direct effects on biological processes or behavioral patterns that influence disease risk.

Gabor Maté

Let’s Begin

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Stress

- “Stress is a composite, multidimensional construct, in which three components interact:
- (i) the input, when the stressor is perceived and appraised,
- (ii) the central processing of stressful information
- (iii) the output or stress response.”

Coping

- Lazarus and Folkman : "*constantly changing cognitive and behavioral efforts to manage, [that is to master, tolerate, reduce, minimize] specific external and/or internal demands, [and conflicts among them], that are appraised as taxing or exceeding the resources of the person*" (p. 141).
- Efforts to control, reduce, or learn to tolerate the threats that lead to stress are known as coping.
- We habitually use certain coping responses to deal with stress, coping efforts can change over time, and that coping is contextual,

Coping

- how people deal with stress can reduce or amplify the effects of adverse life events and conditions, not just on emotional distress and short-term functioning, but also long-term, on the development of physical and mental health or disorder.

- coping has short-term effects on the resolution of the stressor as well as long-term effects on mental and physical well being.

- “specific coping responses: the behaviors, cognitions, and perceptions in which people engage when actually contending with their life-problems” (Pearlin & Schooler, 1978)

Coping

- Coping has its roots in several different theoretical traditions.
- The psychodynamic approach focused on defense mechanisms (eg., Anna Freud (1966), defined as the “largely unconscious means by which the ego warded off the anxiety generated by conflicts between the superego and the id.”
- Defense mechanisms distort reality—for example, by denying the existence of problems, projecting them onto others, or transforming them through displacement or reaction formation—and thus are inherently pathological.

Different dimensions of Coping

- Lazarus and Folkman (1984) focused on conscious processes
- Compas et al. (1996) - many coping responses, especially those used with chronic stress, are actually involuntary.
- Repetti and Wood (1996), for example, found that social withdrawal in the face of stress is fairly common and may not be consciously recognized as a coping attempt.
- Coping styles approaches focus on typical ways of coping with problems with may be rooted in personality (Millon, 1982)
- Individuals may alternate between denial and action (Lazarus, 1983; Pennebaker, Colder, Sharp, 1980).

Coping

- Coping is responsive to situational demands (for a review, see Aldwin, 2007).

- Ridder and Kerssens (2003) showed that coping is influenced by both personality and situational characteristics.

- Folkman and Lazarus (1980) showed that the most people use both problem- and emotion-focused coping in over 80% of situations.

Problem-focused Coping Strategies

- Problem-focused coping strategies aim to change or eliminate a stressor, aimed at resolving the stressful situation or altering the source of the stress.
- If you adapt a strategy to try to deal with the stressor directly, you're using problem-focused coping.
- For example, planning, problem-solving, or removing the stressor, seeking information or assistance in handling the situation, are examples of problem focused coping.

Folkman and Lazarus (1980)

Emotion-focused Coping Strategies

- Emotion-focused coping is when you try to deal with your emotional response to the stressor.
- Involves regulating your feelings and emotional response to the problem
- If you are trying to reduce, eliminate, or tolerate your emotional response to a stressor, then you're using emotion-focused coping.
- Examples: withdrawal, letting out anger and frustration, emotional support seeking, distractions, rumination, and resignation acceptance (accepting the problem will always exist). Instead of trying to meet new people, you might journal when you feel lonely to try to process what you're feeling.

Folkman and Lazarus (1980)

Coping Strategies: bottom-up approaches

- Body sensations or feelings are the first to occur.
- It's difficult to reassure someone of their safety when the alarm (amygdala) is on.
- The body is **too busy reacting** for the brain to think. Fight, flight, freeze, or fawn responses can hijack higher parts of the brain.
- The lower parts responsible for sensory-motor and survival need to function well before the higher parts can take over.

Examples of bottom-up approaches

- Breathing exercises
- Sensory-motor skills
- Exercises
- Muscle relaxation
- Yoga
- Snacks
- Smoking

Coping Strategies: top-down approaches

- higher order categories (e.g., avoidance, emotion-focused coping, accommodation)
- The Prefrontal Cortex: associated with **thinking and logic**, **higher order emotion awareness**.
- Top-down emotions are conscious responses to how we think about our circumstances.
- For instance, a person can get anxious after deciding they haven't studied hard enough for an exam.

Examples to top-down approaches

- **CBT -** Cognitive Behavioral Therapy
- *"CBT helps you become aware of inaccurate or negative thinking, so you can view challenging situations more clearly and respond to them in a more effective way."*
- ***Try to change the way you think about events***
- ***Increase awareness***
- ***Journaling***
- **Mindfulness**
- **Meditation**

Thank you for your attention!