

Risk Factors and Causes of Abnormal Behavior

Although understanding the causes of abnormal is enormously difficult to achieve because human behavior is so complex, one of the primary goals of clinical psychology, like science more generally, is to understand the nature of relationships among variables of interest

Study of causes and risk factors for abnormal behavior includes:

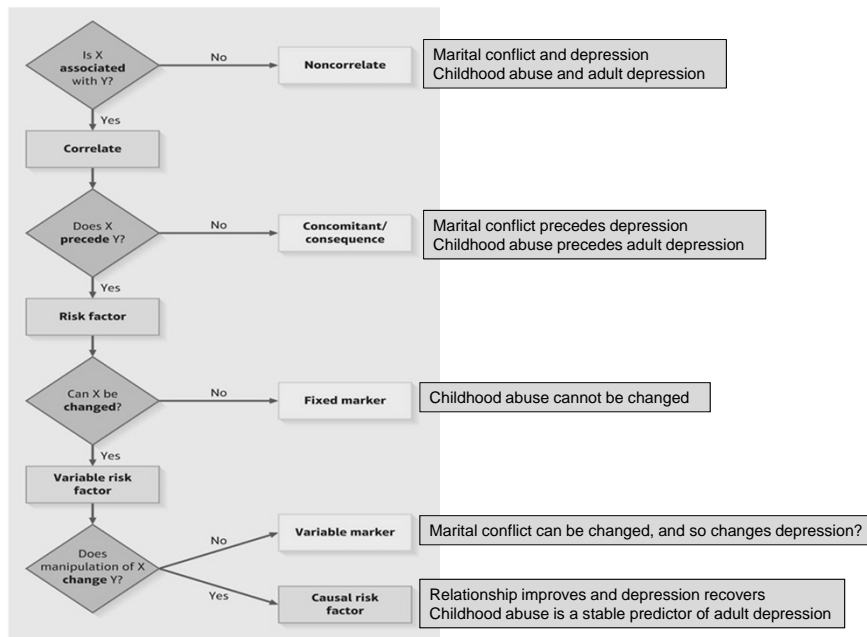
1- Necessary, sufficient, and contributory causes

2- Feedback and bidirectionality in abnormal behavior

3- Diathesis-stress models

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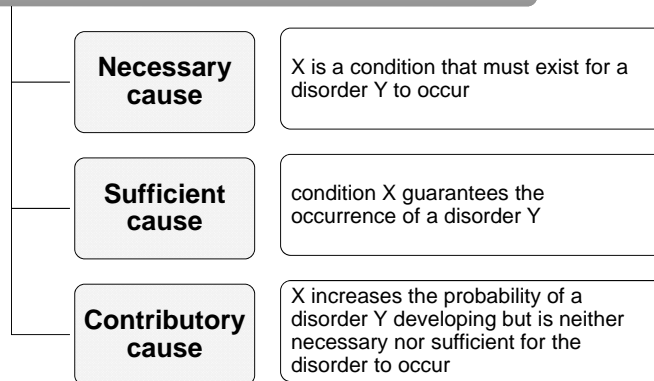


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1- Necessary, Sufficient, and Contributory Causes

Etiology = Causal pattern of abnormal behavior

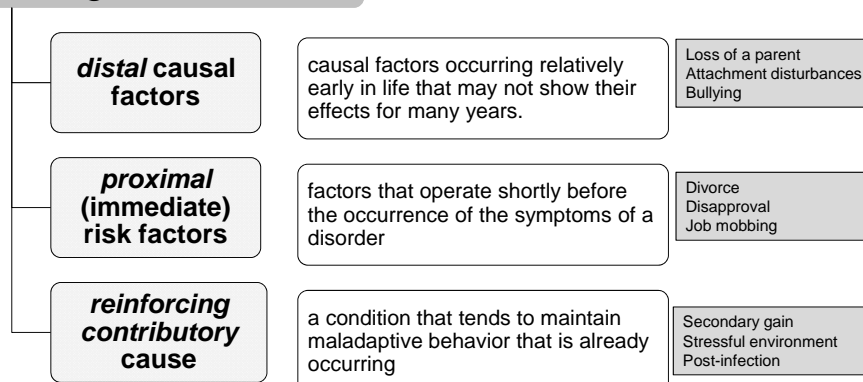


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1- Necessary, Sufficient, and Contributory Causes

It is important to distinguish between



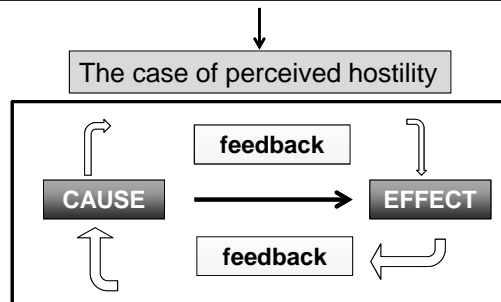
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2- Feedback and Bidirectionality in Abnormal Behavior

For many forms of psychopathology, we do not yet have a clear understanding of whether there are necessary or sufficient causes, although answering this question remains the goal of much current research.

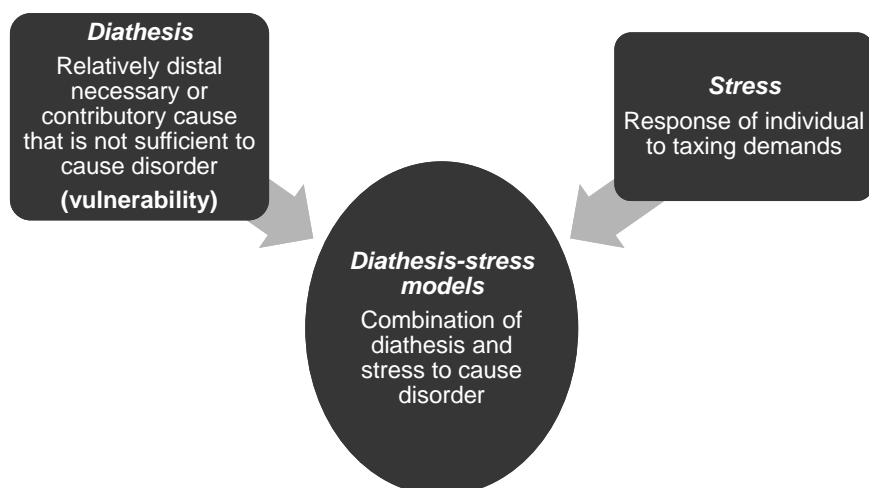
In the study of abnormal psychology, why can it be difficult to specify which conditions are causes and which are effects?



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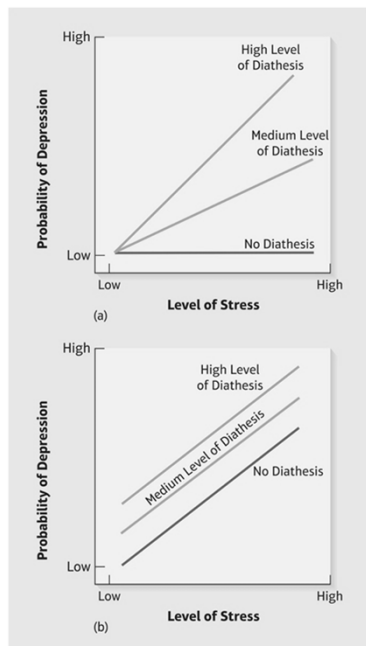
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3- Diathesis-Stress Models



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Interactive Model

Some amount of diathesis must be present before stress will have any effect

A person with no vulnerability will never experience stress-related problems or develop a relevant mental problem in the presence of a very high stressful experience

Additive Model

Diathesis and stress sum together, and when one is high the other can be low, and vice versa

A person with a basic low stress level may develop stronger disturbance when facing to higher stress level but one with a basic higher vulnerability may develop even stronger problems of even a disorder when facing with lower stress level

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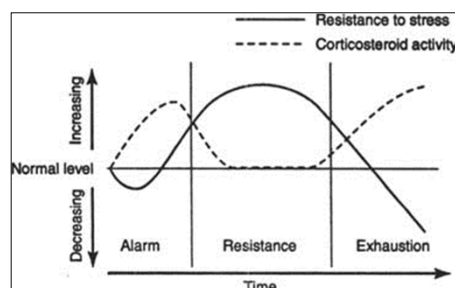
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Stress

the **response** or experience of an individual to **demands of change** that he or she **perceives** as taxing or exceeding his or her personal resources



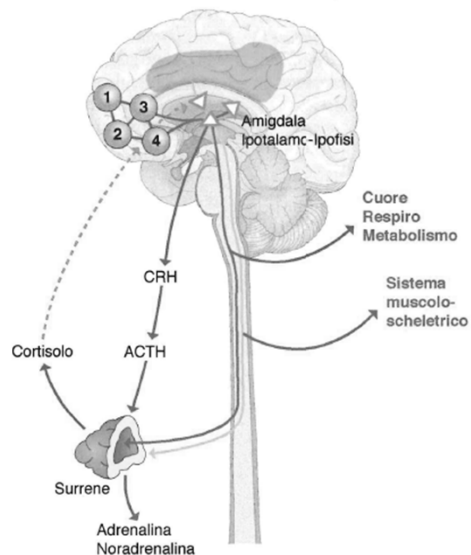
Hans Hugo Bruno Selye
1907-1992



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Asse dello stress



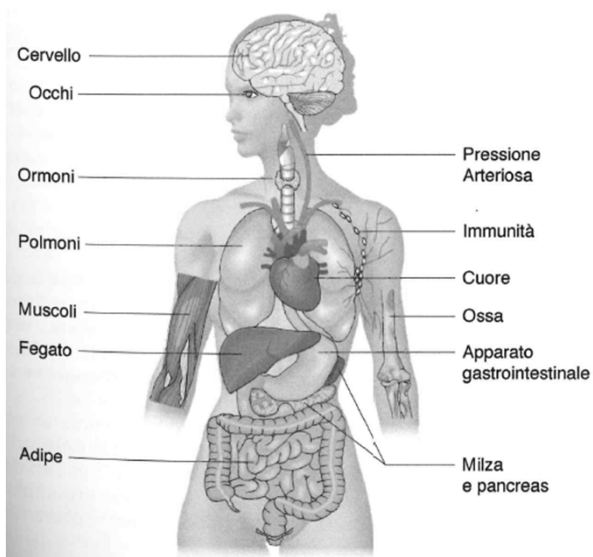
Braccio sistema nervoso

Le aree ventro-mediale (1) e orbito-frontale (2) della PFC e quelle anteriori (pregenuale 3 e subgenuale 4) della ACC attivano la midollare del surrene con produzione di Adrenalina e Noradrenalina, oltre al sistema cardio-respiratorio e metabolico attraverso la **via spino-talamica**.

Braccio neuroendocrino

Le aree motorie (pre-motoria e motorie primaria e supplementare) e rostro-caudali della ACC attivano la cascata ormonale dello stress (CRH, ACTH e cortisol) attraverso l'asse ipotalamo-ipofisario i cui livelli nel sangue circolante vengono monitorati da PFC e HPA

CORTISOLO



Nel breve periodo, l'effetto è multi-organo per mobilitare tutte le risorse energetiche, muscolari e attentive dell'organismo che consentono di affrontare al meglio gli stimoli stressogeni fisici e psichici.

Gli effetti sono patogeni sul lungo periodo se non si verifica il feedback negativo su produzione e ritmo del cortisolo.

Factors Predisposing a Person to Stress

Nature of stressor

Experience of crisis

Life changes

Individual perception of stressor

Individual stress tolerance

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Characteristics of Stressors

Stressors that involve the more important aspects of a person's life - such as the death of a loved one, a divorce, a job loss, a serious illness, or negative social exchanges - tend to be highly stressful for most people

Key factors:

Severity

Chronicity

Timing

Degree of impact

Level of expectation

Controllability

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Diathesis-Stress Models

Protective factors

Influences that modify person's response to stressors

Protective factors most often, but not always, lead to

Resilience

Ability to successfully adapt to very difficult circumstances

Not just the *absence* of a risk factor but the *presence* of factors decreasing the likelihood of negative outcomes among people at risk

- Positive: Having a family environment in which at least one parent is warm and supportive
- Negative: Exposure to stressful experiences that are dealt with successfully can promote a sense of self-confidence or self-esteem.
- Individual trait: Adolescents who score high on emotional intelligence are less likely to show negative outcomes following childhood abuse.

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DSM-5

(main) Trauma- and Stressor-Related Disorders

Reactive Attachment Disorder	Markedly disturbed and developmentally inappropriate attachment behaviors, in which a child rarely or minimally turns preferentially to an attachment figure for comfort, support, protection, and nurturance. The essential feature is absent or grossly underdeveloped attachment between the child and caregiving adults
PTSD	Symptoms following exposure to one or more traumatic events (exposure to war, physical or sexual abuse, being kidnapped, being taken hostage, terrorist attack, torture, incarceration, natural or human-made disasters, and severe motor vehicle accidents). The individual has recurrent, involuntary, and intrusive recollections of the event (recurrent dreams, dissociative states, flashbacks). The individual commonly takes deliberate efforts to avoid thoughts, memories, feelings, or talking about the traumatic event. Persistent and exaggerated negative expectations regarding important aspects of life applied to oneself, others, or the future
Acute Stress Disorder	Symptoms must occur and resolve within 1 month of the traumatic event. Otherwise, diagnosis is PTSD
Adjustment Disorder	Out-of-proportion emotional and behavioral response to an identifiable stressor (single: divorce; multiple: job + marital problems; recurrent: unsatisfying sexual relationship; continuous: disabling disease). The disorder resolves in 6 months once the stressor is removed

Four categories of biological factors relevant to maladaptive behavior

Genetic
vulnerabilities

Brain
dysfunction
and neural
plasticity

Neuro-
transmitter &
hormonal
abnormalities
in brain and
CNS

Personality

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Genetic Vulnerability

1. Genes are very long molecules of DNA that are present at various locations on 23 pairs of chromosomes (46 total) of each human cell.
 - They are the carriers of the information that we inherit from our parents.
 - Genes do not fully determine whether a person develops a mental disorder; however, there is substantial evidence that most mental disorders show at least some genetic influence.
2. Chromosomes are the chain-like structures within a cell nucleus that contain the genes.
3. Research in genetics has shown that abnormalities in the structure or number of chromosomes can be associated with major defects or disorders (for example, Down Syndrome).
4. More typically, personality traits and mental disorders are not affected by chromosomal abnormalities per se, but rather by abnormalities in some of the genes or chromosomes or by naturally occurring variations of genes known as polymorphisms.
5. Vulnerabilities to mental disorders are almost always polygenic, which means they are influenced by multiple genes or by multiple polymorphisms of genes, with anyone having only very small effects.

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Genotype

- Total genetic endowment
- A person's total genetic makeup
- Except for identical twins, no two humans ever begin life with the same genetic makeup.

Phenotype

- Observed structural and functional characteristics that result from an interaction of the genotype and the environment

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Methods for Studying Genetic Influences

Shared environmental

influences are those that would make children in a family more similar, whether the influence occurs within the family or in the environment (e.g., parental conflicts, economics)

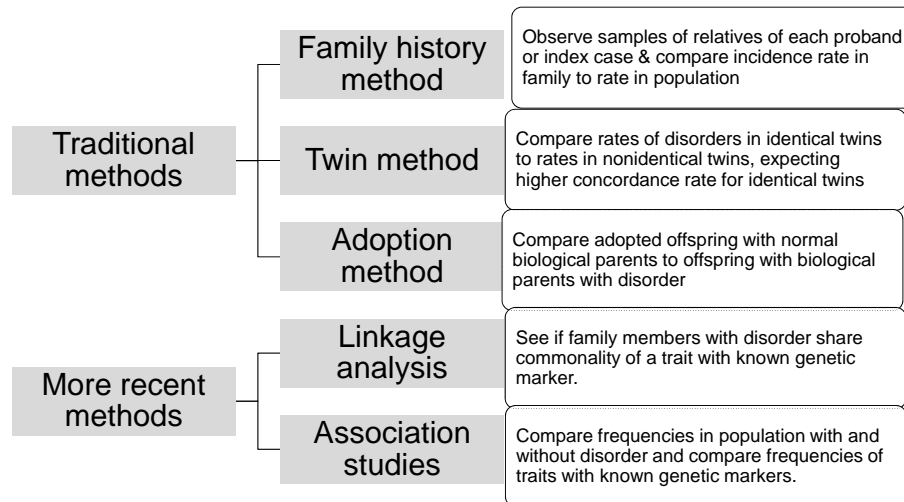
Non-shared environmental

are those in which the children in a family differ, such as experiences at school and also some unique features of upbringing in the home, such as a parent treating one child in a qualitatively different way from another

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Methods for Studying Genetic Influences



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Genes, Genetics, and Epigenetics: A Correspondence

C.-t. Wu and J. R. Morris
SCIENCE VOL 293 10 AUGUST 2001

EPIGENETICS

The study of changes in gene function that are heritable but that do not entail a change in DNA sequence: *any process that alters gene expression without changing the DNA sequence.*

In other words, "epigenetics" refers to the study of heritable changes that occur not because there is an intrinsic change in the genetic material per se, but because there is a change in the pattern of expression of certain genes as a result of processes other than genetic mutation or recombination. Something influences the genetic code from "above" to either shut down or induce the transcription of genetic sequences, giving rise to either biologically overactive or silent processes.

The DNAm is the most studied mechanism. It refers to the addition of a methyl group, primarily in the context of cytosine-guanine (CpG islands) dinucleotides, which tend to be embedded in promoter regions of genes. Methylated CpG islands impede transcription factors from accessing the DNA sequence. Increased methylation in these regions is typically associated with inhibition of gene transcription (ie, gene silencing) and chromatin compaction.

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Antisocial behavior, genetics and childhood maltreatment

Australian study, N = 1037 (M = 52%)

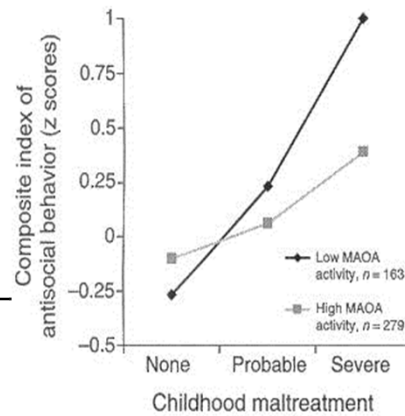
Individuals assessed at age 3, 5, 7, 9, 11, 13, 15, 18, 21 and 26

Maltreatment (at age 3-11):

- Severe: 8%
- Probable: 28%
- None: 64%

Genotype MAOA, located on the X chromosome. It encodes the MAOA enzyme, which metabolizes

neurotransmitters (NE, 5-HT, DA), rendering them inactive. Genetic deficit of MAOA is linked to aggressive behavior in rats and humans.



Composite index of 4 outcomes (at age 26)

1. Conduct Disorder (DSM-IV)
2. Convictions for violent crimes
3. Personality disposition toward violence (psychological testing)
4. Antisocial PD by-proxy

Significant interaction between MAOA activity and childhood maltreatment

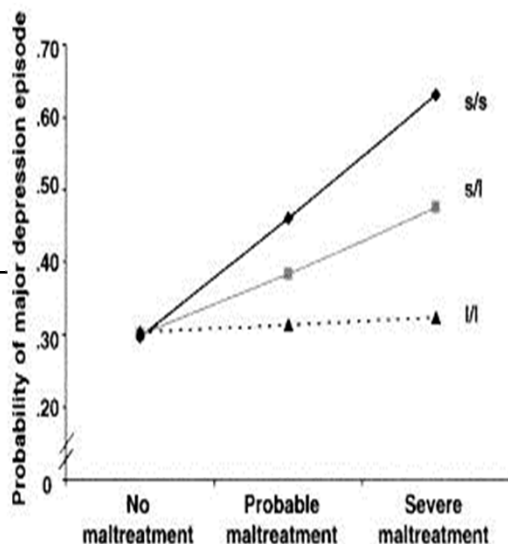
Alleles = alternate forms of DNA sequencing at a specific locus
Genotype = combination of alleles at a given locus

Caspi et al, *Science* 2002; 297: 851

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Adult depression, genetics and childhood maltreatment



Significant interaction between 5-HTTLPR (one or both short alleles), depression (at age 18-26) and childhood maltreatment (at age 3-11)

($b = -.33$, $SE = .16$, $z = 2.01$, $p = .05$)

Caspi et al, *Science* 2003; 301: 386

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CHILD DEVELOPMENT

Child Development, January/February 2016, Volume 87, Number 1, Pages 61–72

Prenatal Maternal Stress Predicts Methylation of Genes Regulating the Hypothalamic–Pituitary–Adrenocortical System in Mothers and Newborns in the Democratic Republic of Congo

Darlene A. Kertes and Hayley S. Kamin
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Kertes et al. *Clinical Epigenetics* (2017) 9:68
DOI: 10.1186/s11448-017-0307-4

Clinical Epigenetics

***BDNF* methylation in mothers and newborns is associated with maternal exposure to war trauma**

Darlene A. Kertes^{1*}, Samarth S. Bhatt², Hayley S. Kamin², David A. Hughes², Nicole C. Rodney⁴ and Connie J. Mulligan²

- 24 mothers (mean age 27) and their newborns (umbilical cord blood, maternal venous blood, placenta tissue, and birth weight of newborns) in the Democratic Republic of Congo
- Assessment of chronic stress (eg, forced marriage) and war-related traumas (refugee, exposure to armed conflicts, rapes, sexual abuse)

Maternal experiences of severe and multiple traumas were significantly associated in all 3 sites of DNA extraction with:

- BDNF methylation
- NC3C1, CRHBP, and FKBP5 key regulating genes for HPA system ...
- ... and birth weight of newborns

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Imbalances of Neurotransmitter Systems

Neurotransmitter imbalances

5 most studied neuro-transmitters

- Can result in abnormal behavior
- Created in various ways: overproduction, deactivation, abnormally sensitive or insensitive

monoamines

- Norepinephrine (alarm, stress, danger, attention, motivation)
- Dopamine (energy, cognition, lust, substance, dependence, schizophrenia)
- Serotonin (data processing, anxiety, mood)

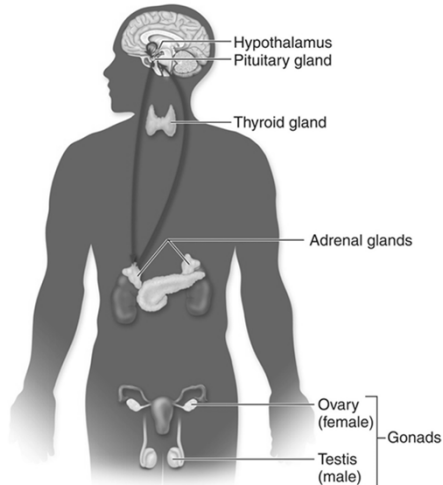
- Glutamate (arousal, schizophrenia)
- Gamma aminobutyric acid (GABA) (arousal, schizophrenia)

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Major Glands of the Endocrine System

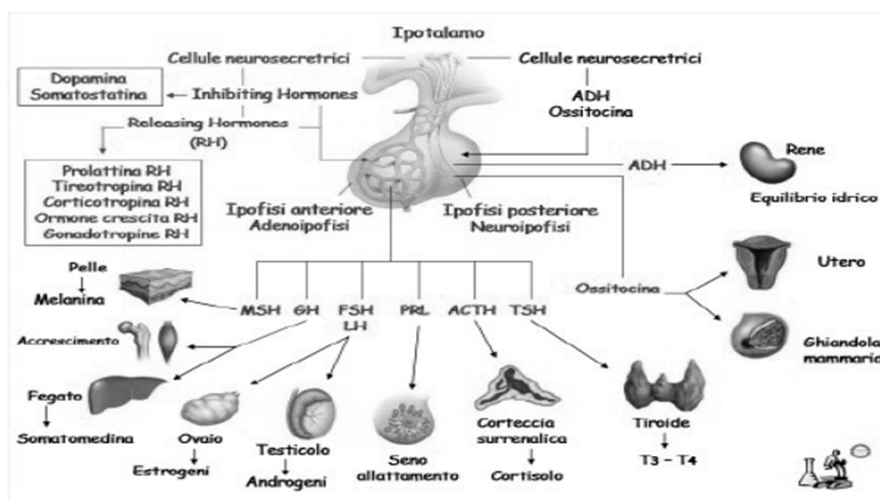
This figure illustrates some of the major glands of the endocrine system, which produce and release hormones into the bloodstream. The **hypothalamic-pituitary-adrenal axis** is also shown (red arrows). The hypothalamus and pituitary are closely connected, and the hypothalamus periodically sends hormone signals to the pituitary (the master gland), which in turn sends another hormone to the cortical part of the adrenal glands (above the kidneys) to release epinephrine and the stress hormone cortisol.



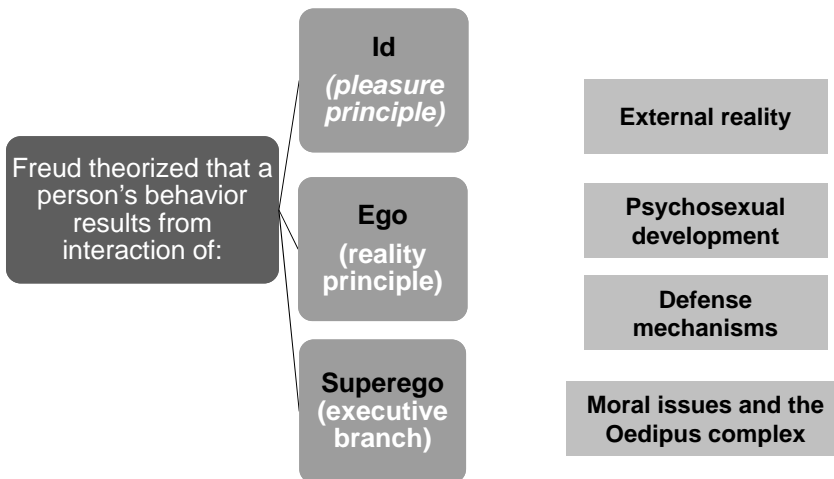
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HPA E SISTEMA ENDOCRINO



The Psychodynamic Perspective

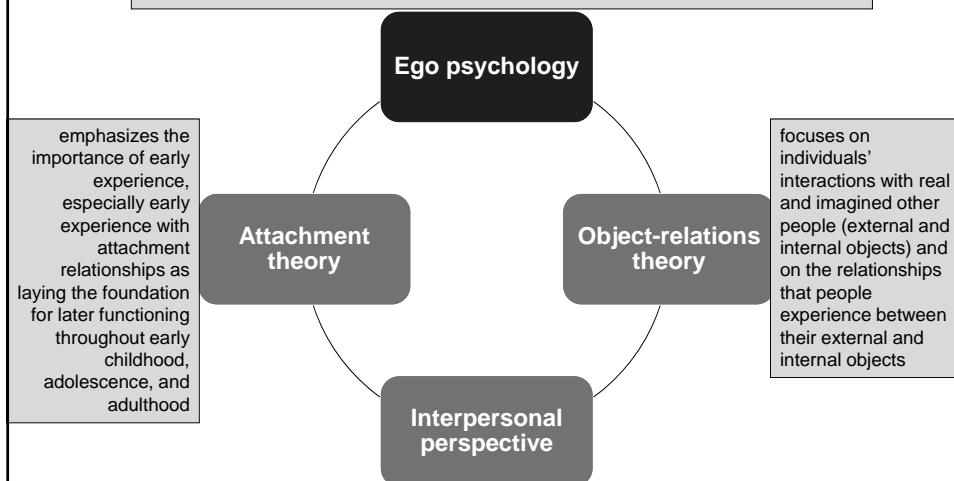


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Newer Psychodynamic Perspectives

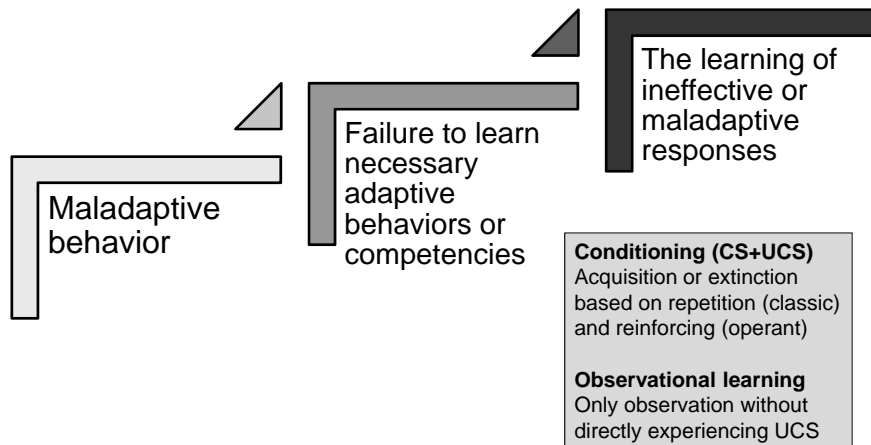
psychopathology develops when the Ego does not function adequately to control or delay impulse gratification or does not make adequate use of defense mechanisms when faced with internal conflicts



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The Behavioral Perspective (the *black box*)



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The Cognitive-Behavioral Perspective (CBT)

<i>Schema:</i>	<i>Attributions:</i>	<i>Attributional style:</i>
<ul style="list-style-type: none"> Underlying representation of knowledge that guides current processing of information 	<ul style="list-style-type: none"> Process of assigning causes to things that happen 	<ul style="list-style-type: none"> Characteristic way in which individual may tend to assign causes to bad or good events

A. Bandura theory of self-efficacy: the belief that one can achieve desired goals; he posited that cognitive-behavioral treatments work in large part by improving self-efficacy

A. Beck ABC model: Past / Triggering Events + Beliefs + Emotional and Behavioral Consequences

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