



MASTERING THE MODERN MIND

with
Kathleen Saxton, Founder & CEO
&
Joseph LeDoux, Neuroscientist

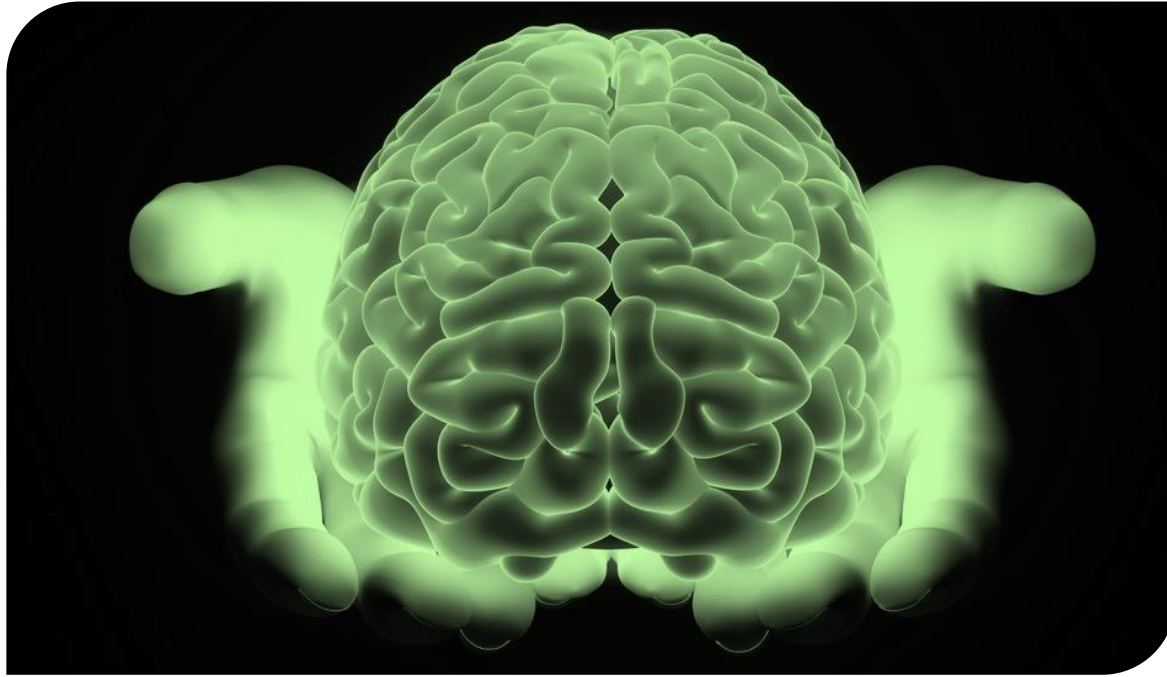
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The Brain: What does it hold for us?



A Map

- Neuroscience through the back door: My Journey
- Neuroscience vs Neuro-Fication
- My work on fear, anxiety and stress
- Neuro-Fication vs. Neuro-Fact in my research area
- How neuroscience can help you perform better and be less stressed out

Neuroscience through the back door

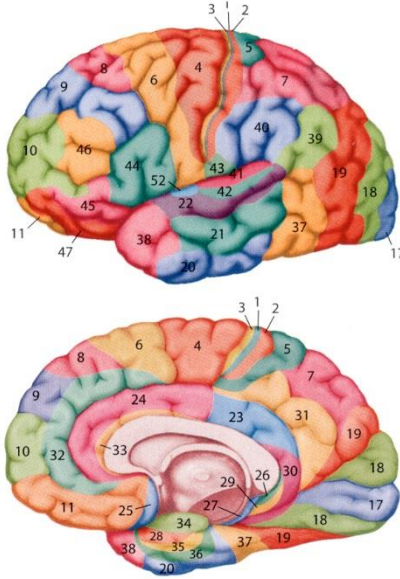
Grew up Eunice LA, a small town in Cajun Country

- 1967: Graduated High School
- 1971: BS in **Business Administration**, LSU
- 1974: MS in **Marketing/Consumer Behavior**, LSU
- 1978: PhD **Psychobiology (neuroscience)**, SUNY Stony Brook

Birth and Growth of Neuroscience

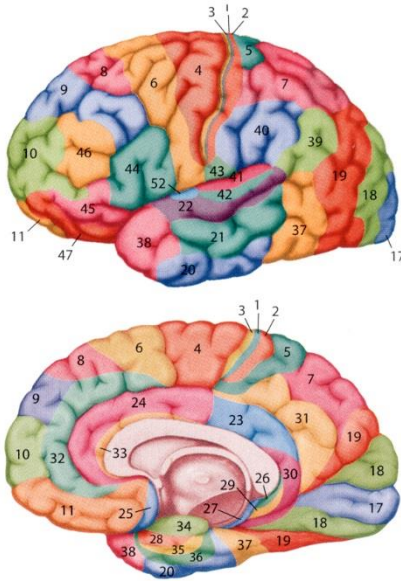
- At the time of my PhD, there were no neuroscientists
- Researchers interested in the brain were psychologists, anatomists, biologists, physiologists, pharmacologists, chemists
- Today: more than 30,000 researchers attend the Society for Neuroscience annual meeting and call themselves NEUROSCIENTISTS

Dogma of Modern Neuroscience



All aspects of mental life and behavior are products of the brain

Studies of the brain may help us understand human nature and improve well-being



Psychological functions are integrated across 3 levels of the brain

Behavioral level



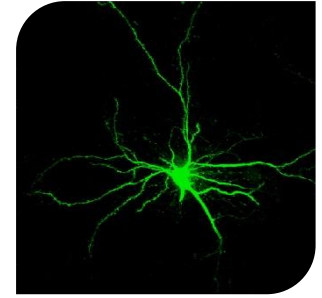
WHAT?

Brain systems level



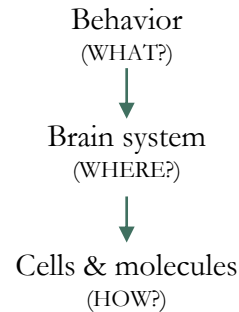
WHERE?

Cellular / molecular level

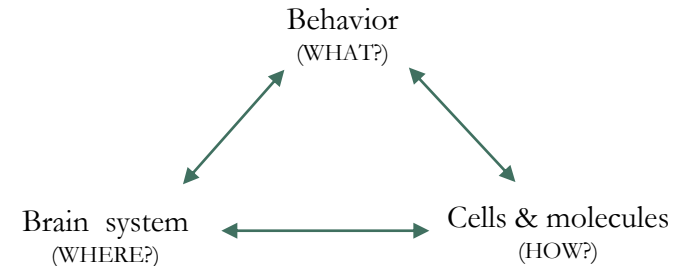


HOW?

REDUCTIVE APPROACH



INTEGRATIVE APPROACH



Just because it's "Neuro" doesn't mean it's
special, different, wiser, more accurate

THE URBAN DICTIONARY *neurofication*

The act of artificially augmenting any science or non-science endeavor with the mystery, validity, and nobility of true neuroscience by simply adding the prefix neuro- to the moniker.

Neuro-this and Neuro-that

SCIENTIFIC

Neuro-Psychology
Neuro-Biology
Neuro-Chemistry
Neuro-Physiology
Neuro-Genetics

ACADEMIC

Neuro-Philosophy
Neuro-Economics
Neuro-Aesthetics
Neuro-Pschoanalysis
Neuro-Literary Criticism

PRATICAL

Neuro-Education
Neuro-Law
Neuro-Marketing/Advertising
Neuro-Management
Neuro-HR

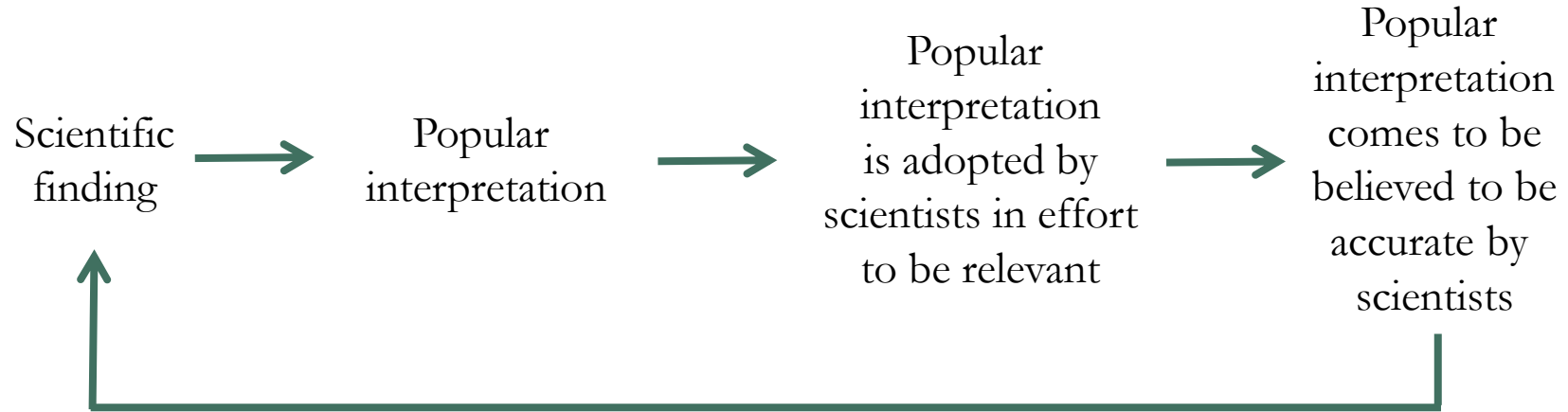
Neuro-Spirituality
Neuro-Happy Hour

IS NEUROFICATION WRONG?

Not in principle

But we need to know when it's
meaningful and when it's hype

Scientists drinking their own Kool-Aid



The left brain is rational (analytic) and the right brain is artistic (wholistic)

Dopamine is the chemical of pleasure

Brain imaging is letting us read minds

The amygdala is the brain's fear center

30 years researching the amygdala

- From obscure brain area to a household word
- Has everyone heard of the amygdala?
- 10 years ago you probably had not

30 years researching the amygdala

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SHADOW OF THE BAT
THE LAST ARKHAIME
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WITH MORTAL KOLLEGE

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PART
THREE
OF
FOUR



Barbara Stafford, Echo Objects:
The Cognitive Work of Images
Univ. of Chicago Press, 2007

“The powerful impact exerted by a flat background together with a clear composition made of of figures arranged in strongly polarized poses demonstrates that such summary forms can bypass focal attention to strike the amygdala directly.”

The Amygdala - Way to Happiness Through Essential Oils
by Rev. Mary Hardy, Ph.D.
TempleofSakkara.com

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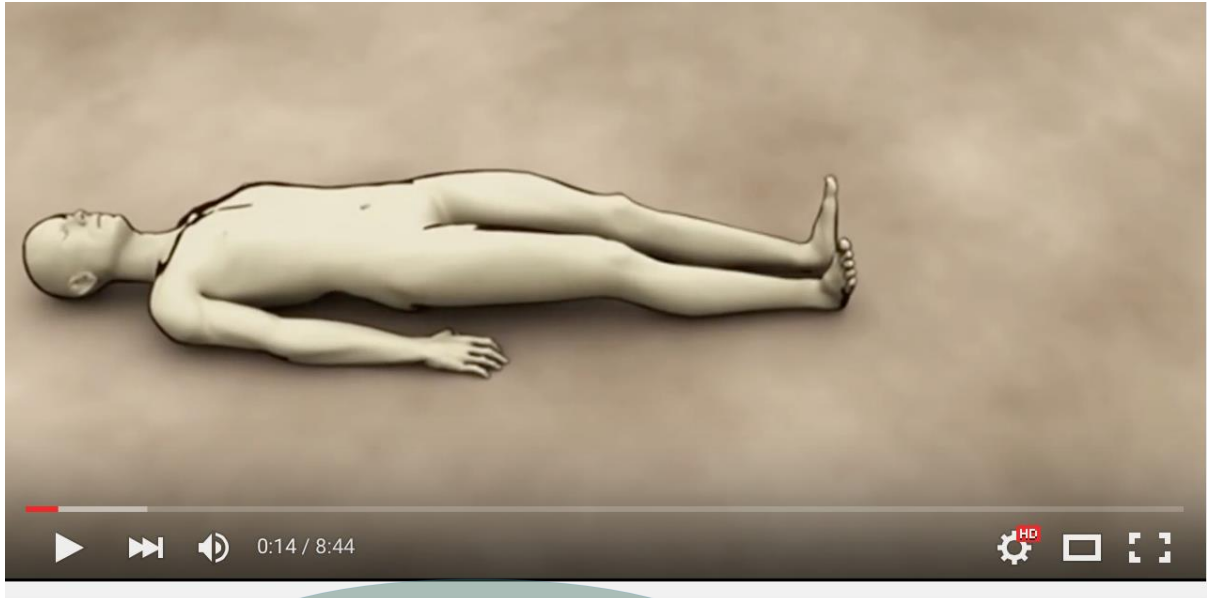
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YouTube



Shpongles - Tickling the Amygdala [Music Video]

NeilSlade.com – Clicking Your Amygdala Forward

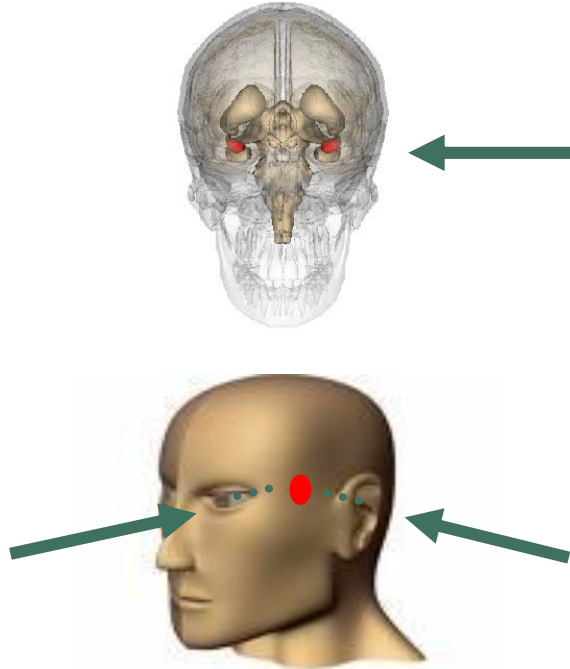
How to click your amygdala forward and eventually! POP! your frontal lobes?
Just start by reading through this site.

You will learn how to click your amygdala forward and turn on genius levels of creativity, intelligence, pleasure, and even ESP in 1/10 the amount of time that students took to learn back in the early days of our brain research.

Clicking your amygdala forward is like wiggling your finger. Only it happens inside your brain instead of on the end of your arm. Do this: wiggle your right index finger... easy, isn't it? Okay, wiggle your left big toe... easy too? Now, locate your amygdala (see chart above)... you click it forward using your frontal lobes- IMAGE that your amygdala is like a click toggle switch- Now click the switch forward towards your forehead. There! You did it.



Where is your amygdala?



What does it look like?



What does the amygdala do?

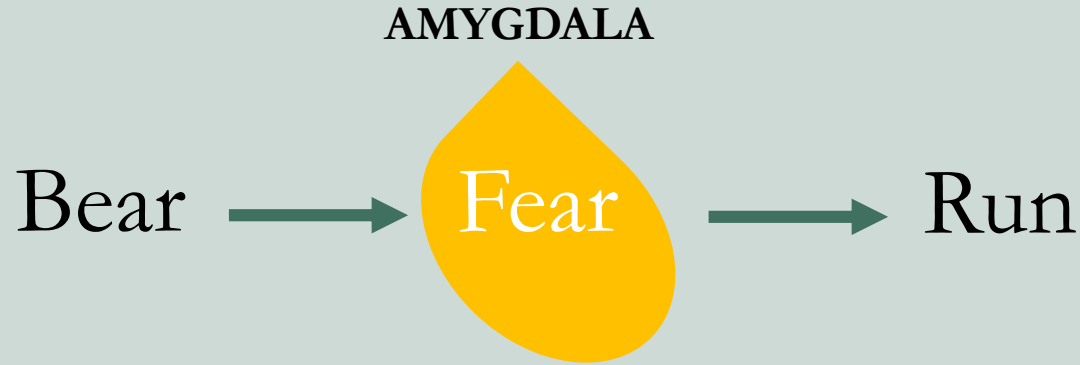
AMYGDALA



Fear Center



The amygdala is the brain's fear center



Surprise

Woman with amygdala damage can still feel fear.

Feinstein et al (2013) *Nature*

*Headlines in Nature, Science,
Scientific American, Wired, Discover:*

“Humans Can Feel Terror Even if They Lack the Brain’s Fear Center,”

“Scaring the Fearless,”

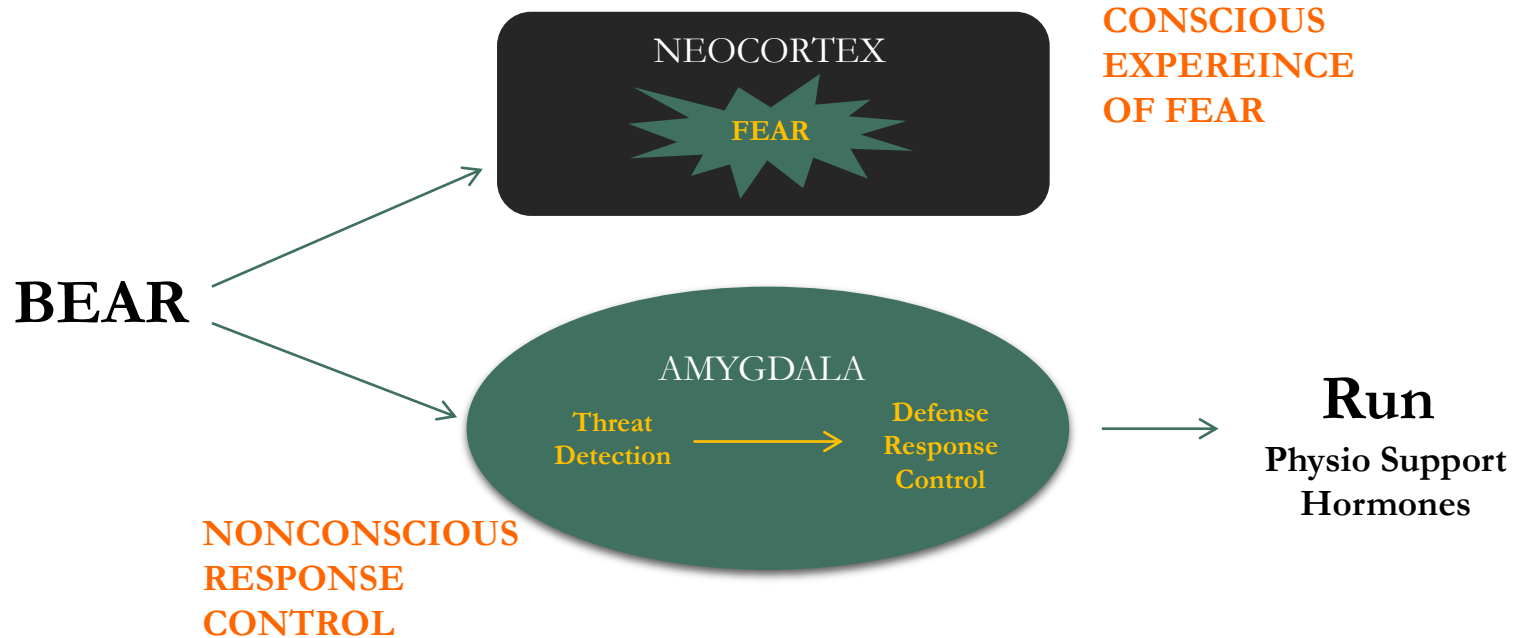
“Evoking Fear in the Fearless,”

“Researchers Scare Fearless Patient,”

“What Scared the Fearless Woman?”

- In people the feeling of fear reliably occurs when we are in danger
- We therefore come to believe that the feeling causes the response
- When we study the amygdala we measure responses and assume that the response was caused by fear
- This is a confusion between causation and correlation
- Threats both elicit responses and feelings but through different Brain circuits

What's going on? The amygdala is **NOT** the fear center



Implications: Why drugs have failed

BIG PHARMA PULLING OUT OF ANTI-ANXIETY DRUG DEVELOPMENT

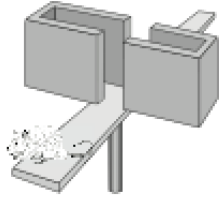
Andrew Witty, CEO GSK, 2010: “We believe the probability of success is relatively low.”

SCIENTISTS

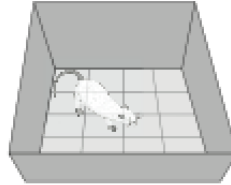
Griebel & Holmes (2013) Clinical outcome of these efforts has been disappointing, as promising results with novel agents have very rarely translated into effectiveness in humans.

Animal tests of “Anxiety”

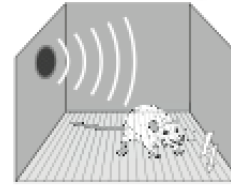
Elevated Plus-Maze



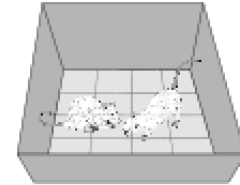
Open-Field



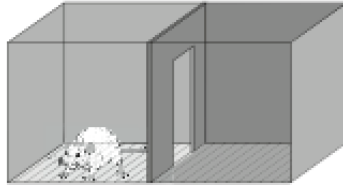
Threat Conditioning



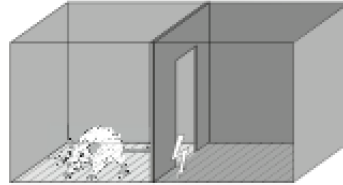
Social Interaction



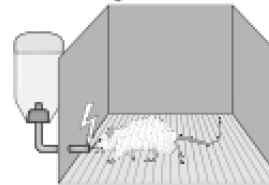
Light/Dark



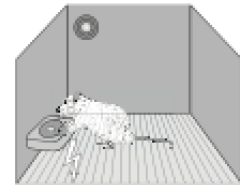
Passive Avoidance

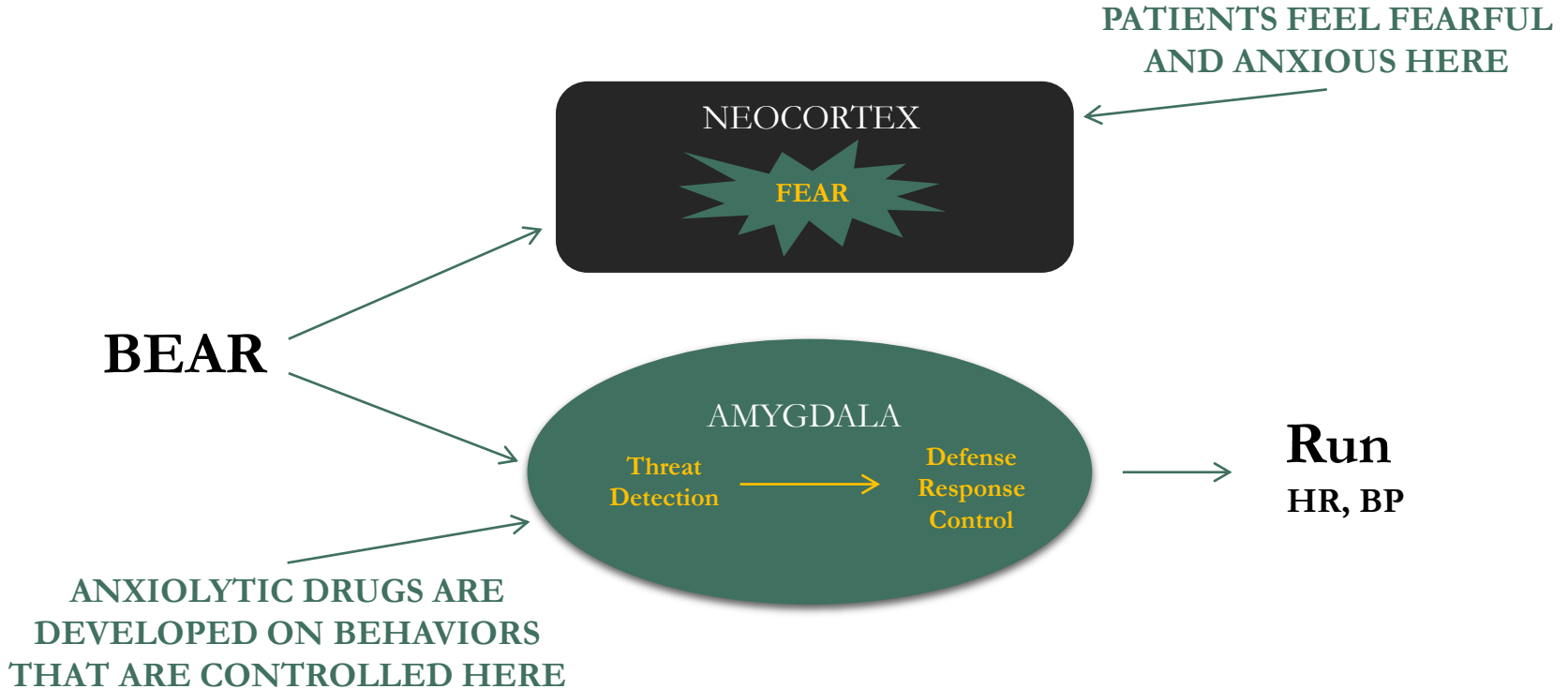


Vogel Conflict



Geller-Seifter Conflict





- Drugs are doing exactly what they were designed to do
 - *Make animals less behaviorally inhibited (less timid) in challenging situations*
- E.g. people with social anxiety are less inhibited (they are more willing to go to a party when medicated) but still feel anxious when there
- Pharma is disappointed because they expected that less inhibited behavior meant less fear or anxiety
- But the drugs are a success because you have to change both feelings and behavioral tendencies, but you have to treat them differently
- Threat detection and conscious feeling are subject to different genetic predispositions and environmental vulnerabilities
- There is no “one size fits all” solution

**Most of what the
brain does occurs
non-consciously**

**Consciousness is
important but is
only part of who
we are and what
we do**

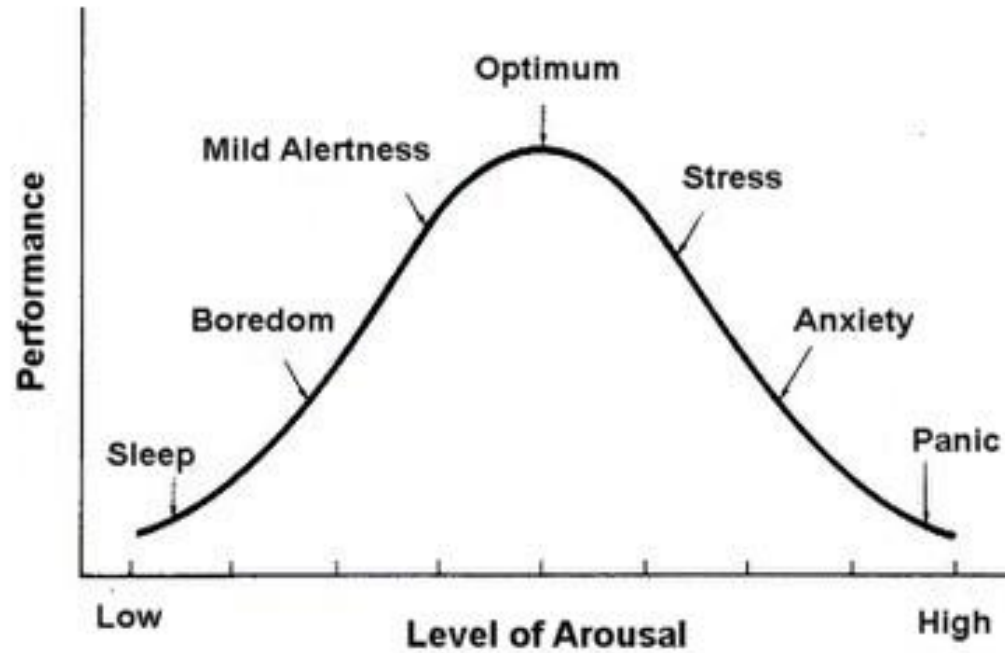
- Our ability to understand the brain is only as good as our conception of what we are studying in the brain
- Just because something is framed as science does not mean it is correct
- Even information conveyed by scientists can be wrong
 - *the brain is a hard nut to crack*
 - *some scientists are technical wizards and have created mind blowing tools for studying the brain; but they assume that they've done the hard work and the behavioral/psychological part is trivial*
 - *but everything hinges on the behavioral/psychological part*
 - *and not all psychologists/behaviorists are created equal*

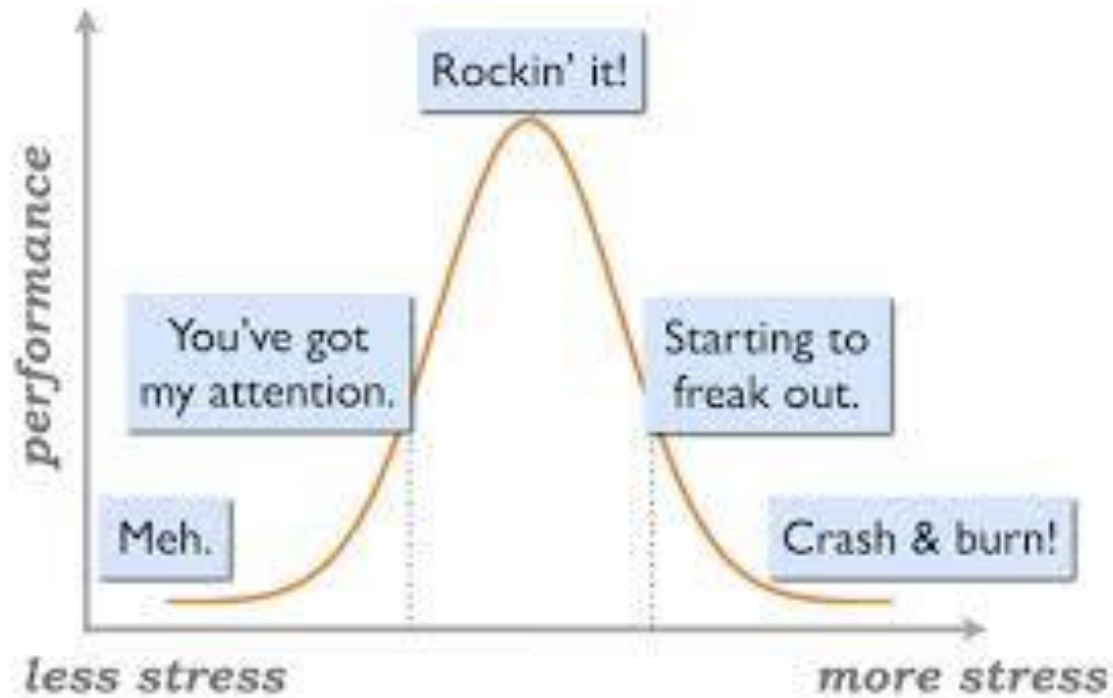
**When you consult
with professionals
about brain,
mind, behavior;
choose wisely and
get multiple
opinions.**

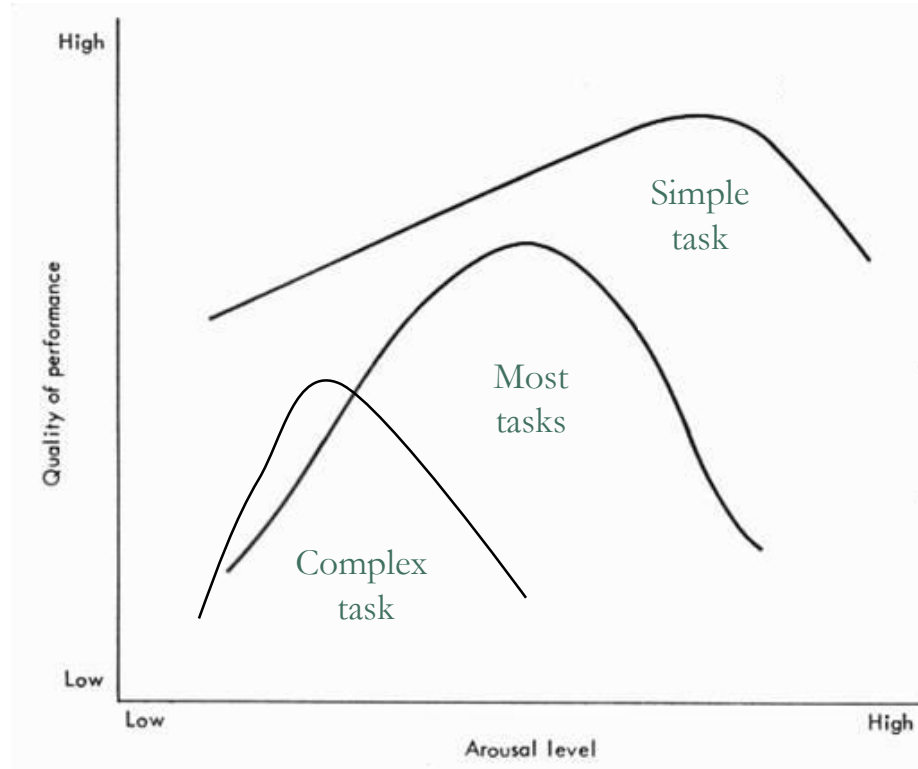
**The wrong
conception will
never lead to the
right conclusion**

FEAR, ANXIETY and STRESS

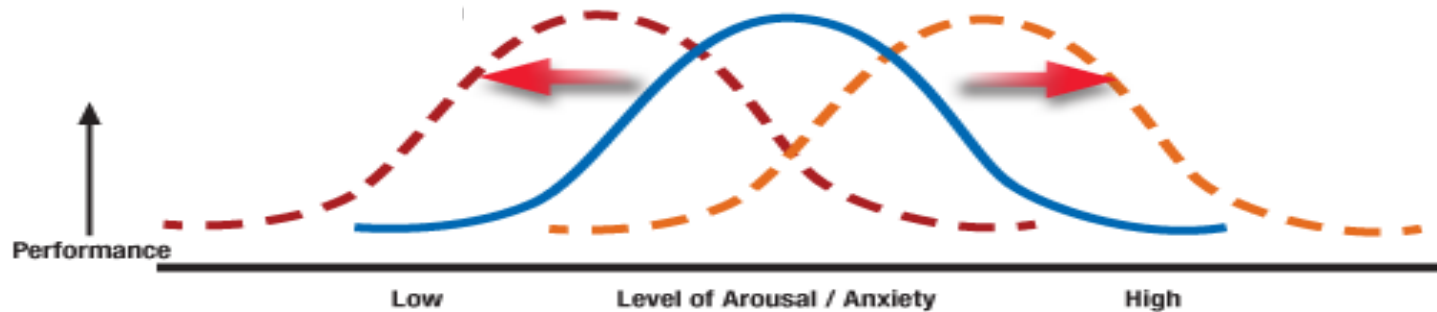
- Fear and anxiety normal responses to the challenges of everyday life
- They are responses to threats
- ***Fear*** is a response to an immediate threat; *feeling that you are in danger of physical harm*
- ***Anxiety*** is a worry or anticipation about a possible threat in the future; *feeling stressed*
- These are natural occurrences. They only become a problem when they interfere with our ability to carry out life's roles







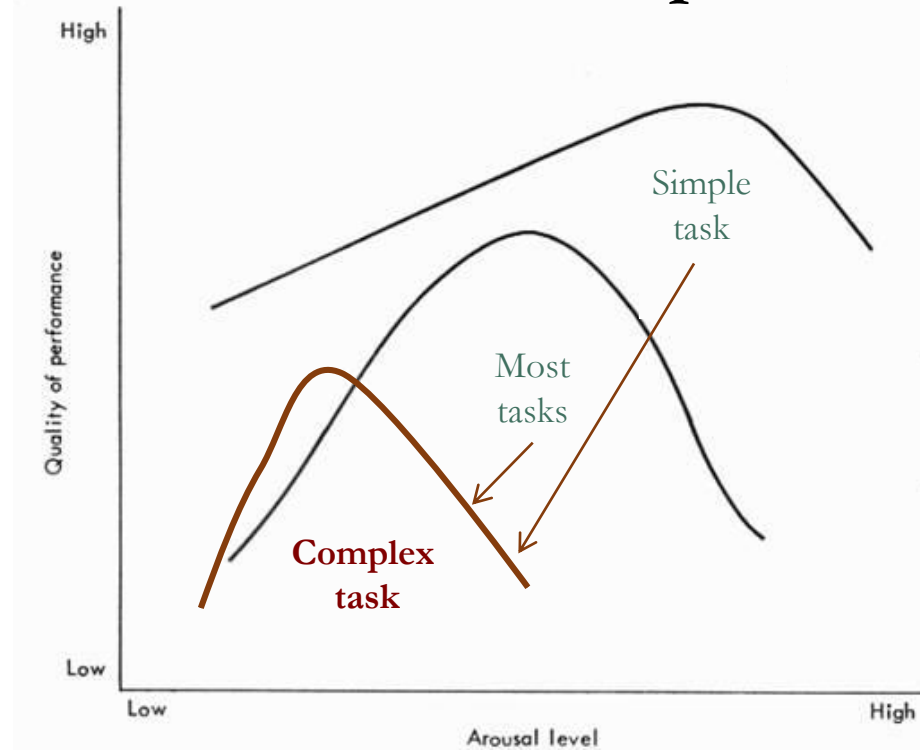
Individual differences

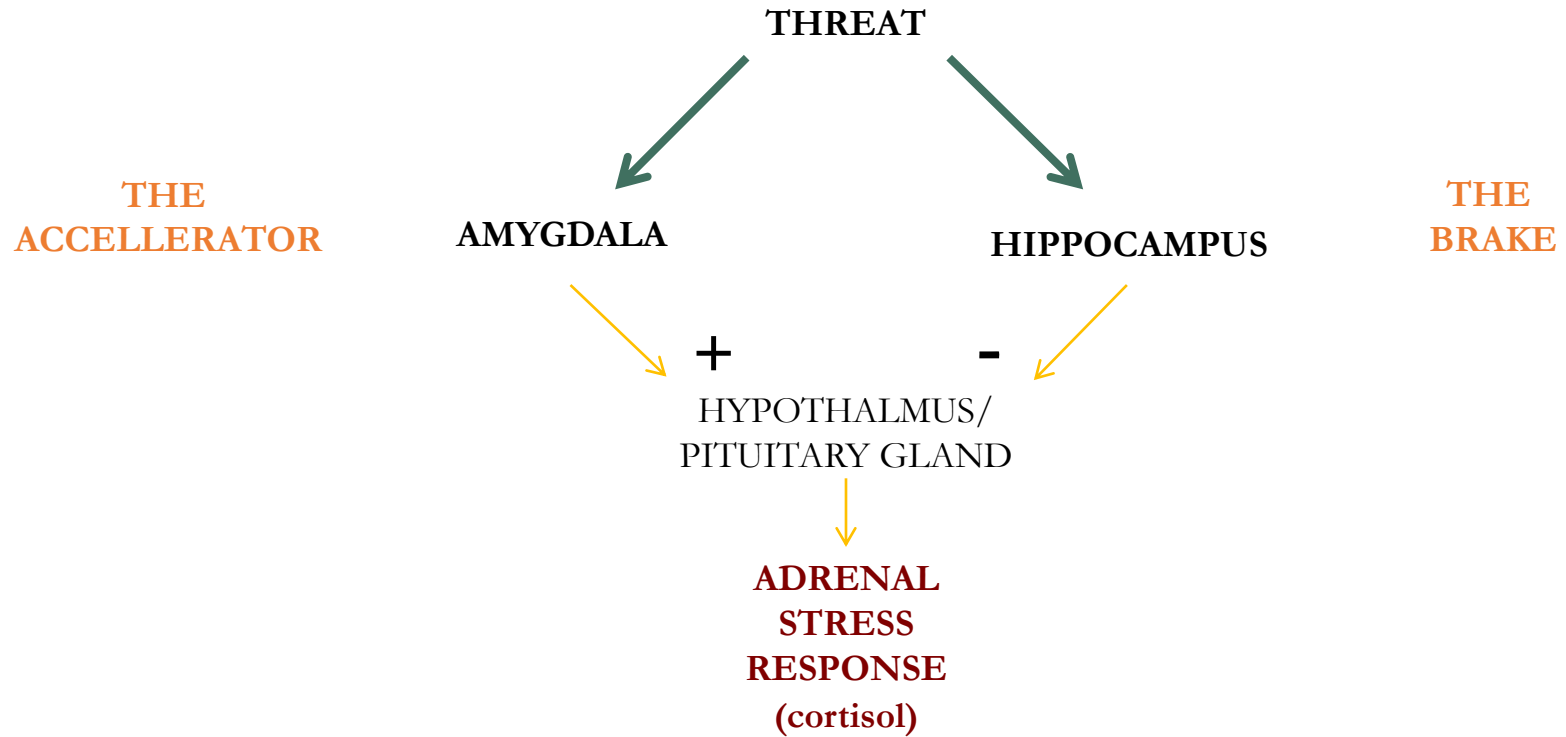


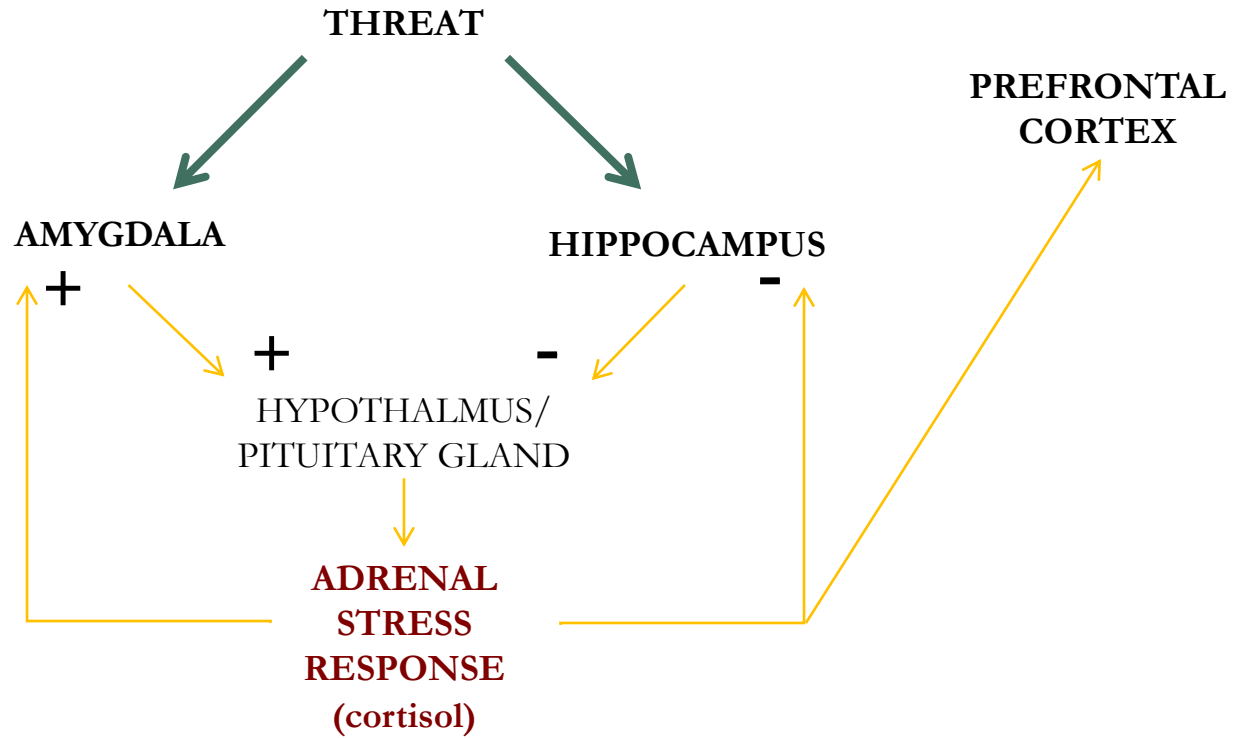
Anxiety and stress are bad for you

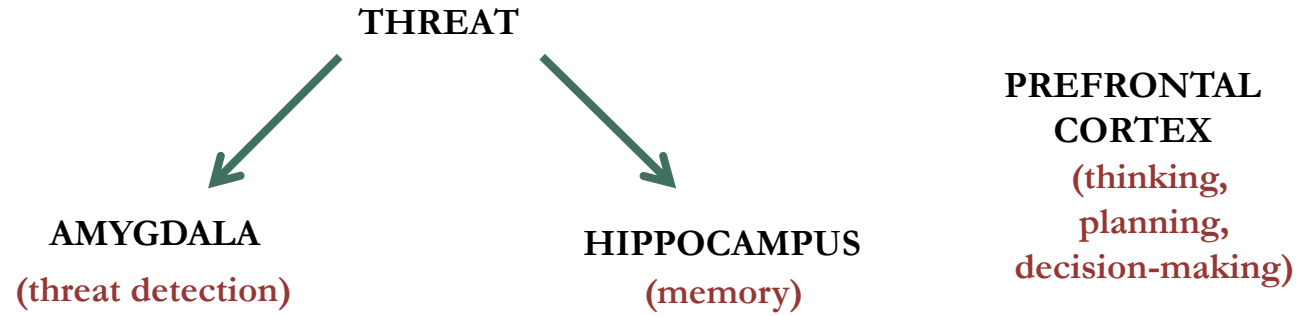


All tasks become complex tasks

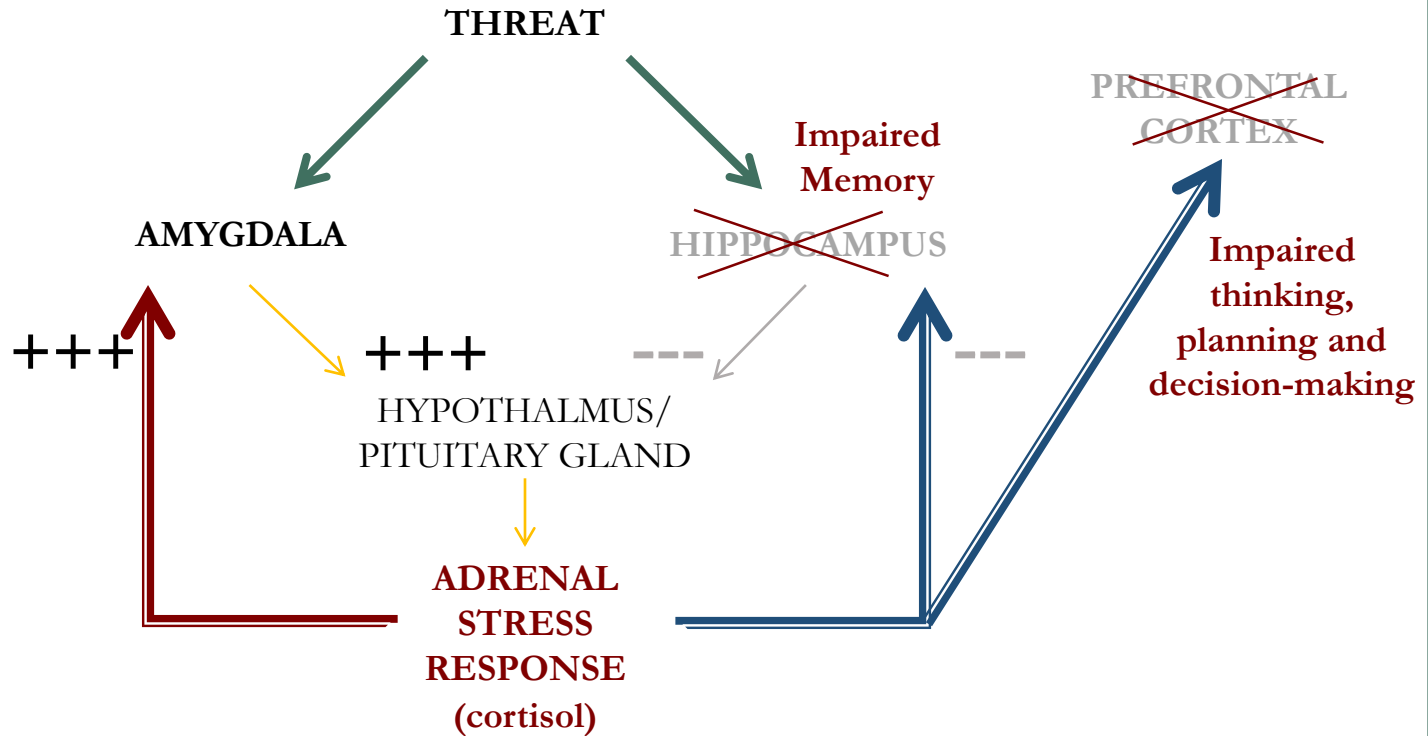




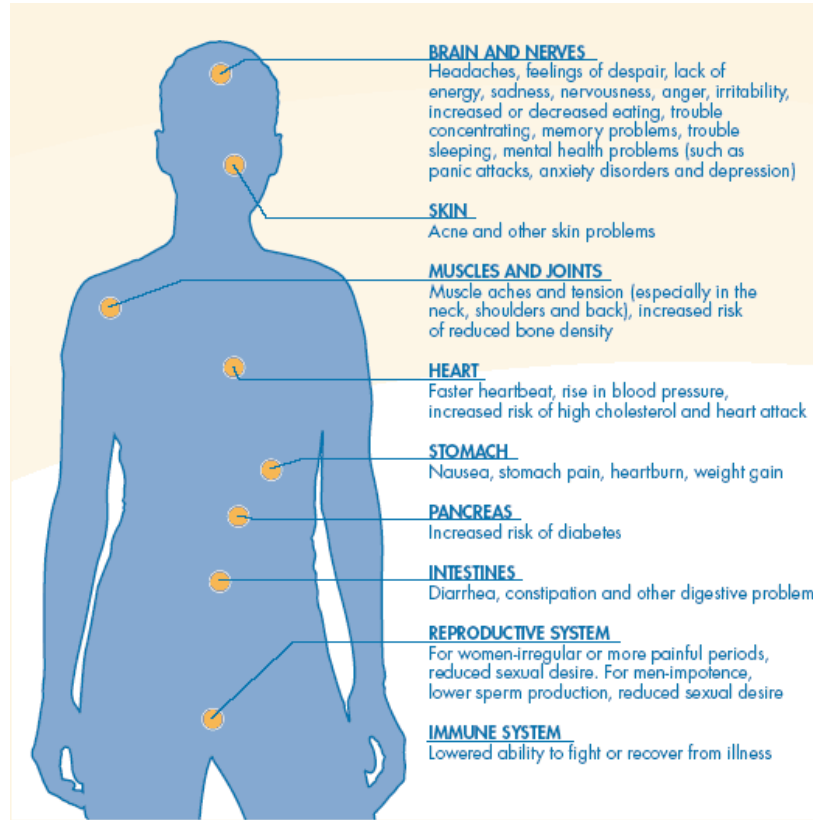




Long-term effects of stress

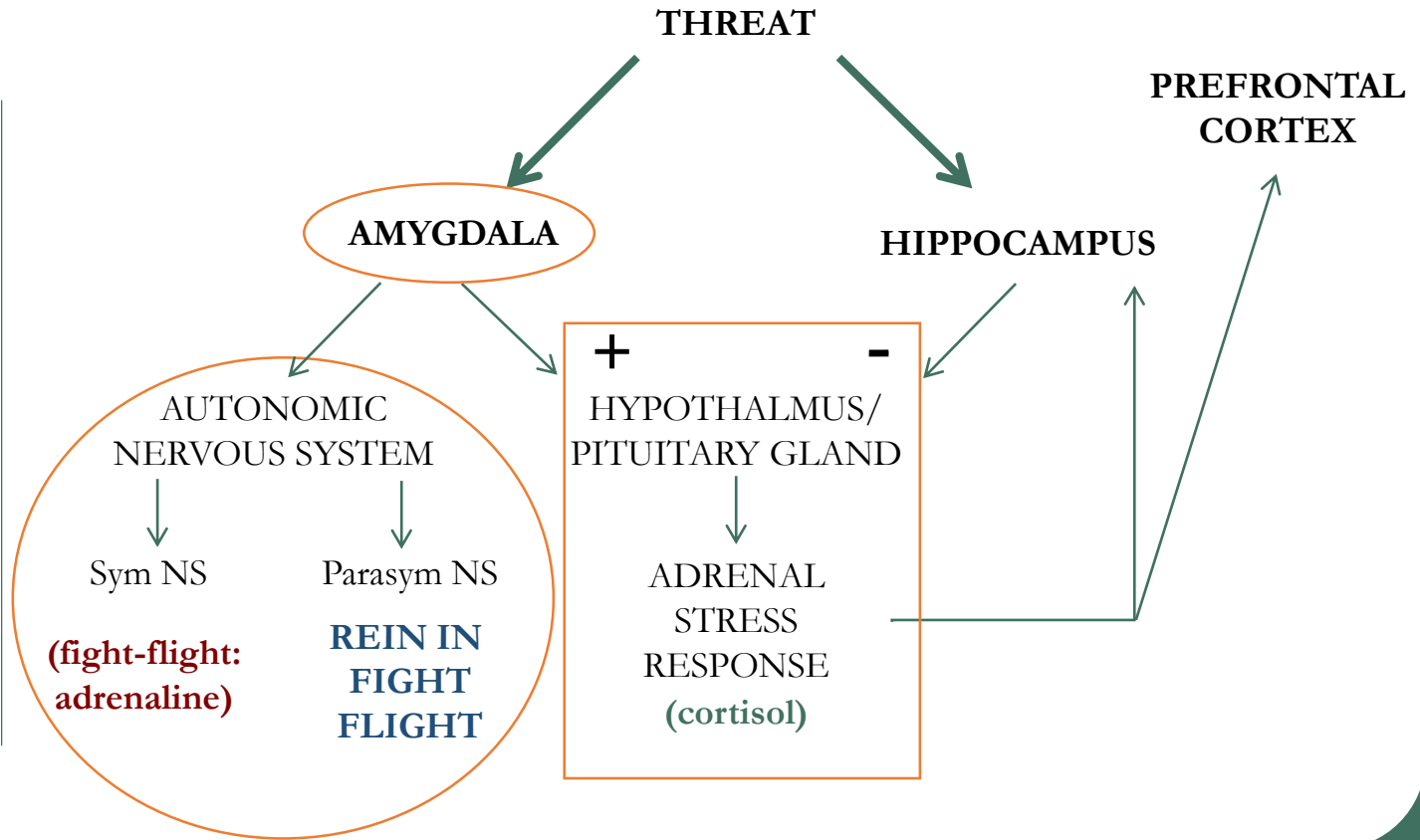


Short-term: mobilization of resources
Long-term: breakdown in ability to cope



Two stress systems

Adrenaline
vs.
Cortisol



How to improve performance under anxiety and stress: (or why things you think work, do work)

Making the obvious scientific

- Break tasks down into achievable parts - makes it easier to be at the optimal performance level for each part
- Spread tasks out. Spaced learning is more efficient than massed. Cramming depletes enzymes that are necessary to convert stm to ltm. Once depleted they have to be resupplied, which takes hours
- Sleep consolidates memory and improves performance. Naps are useful; a good night of sleep is essential

Allow your conscious mind to make things easier for your non-conscious and conscious mind

- Physical exercise improves metabolic function of brain and body (increases alertness, improves mental and physical health)
- Breathing exercises entrain the parasympathetic system and shuts down sympathetic (fight-flight) system
- Meditation trains the conscious mind to focus; avoids distractions coming from conscious and non-conscious brain

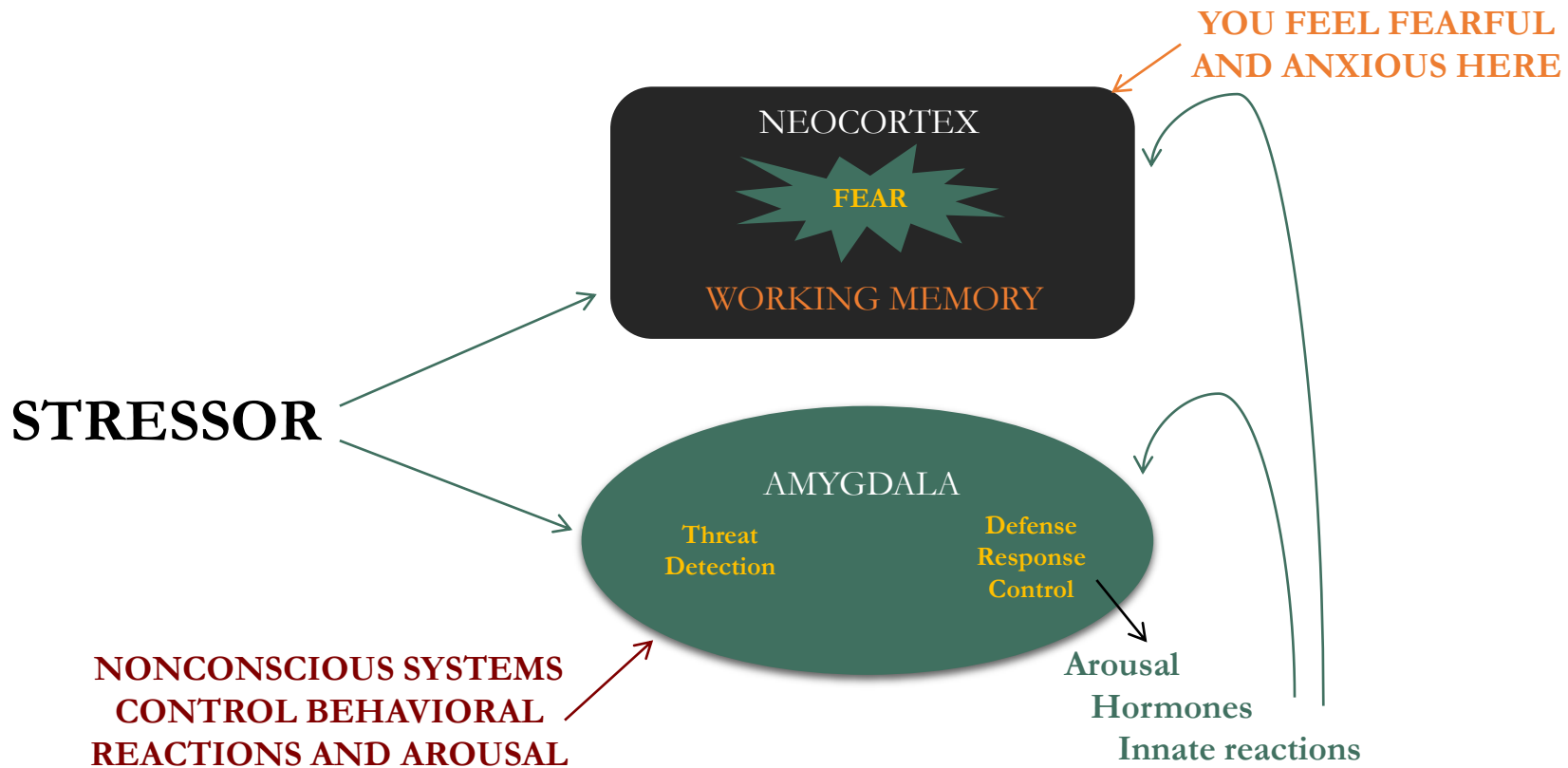
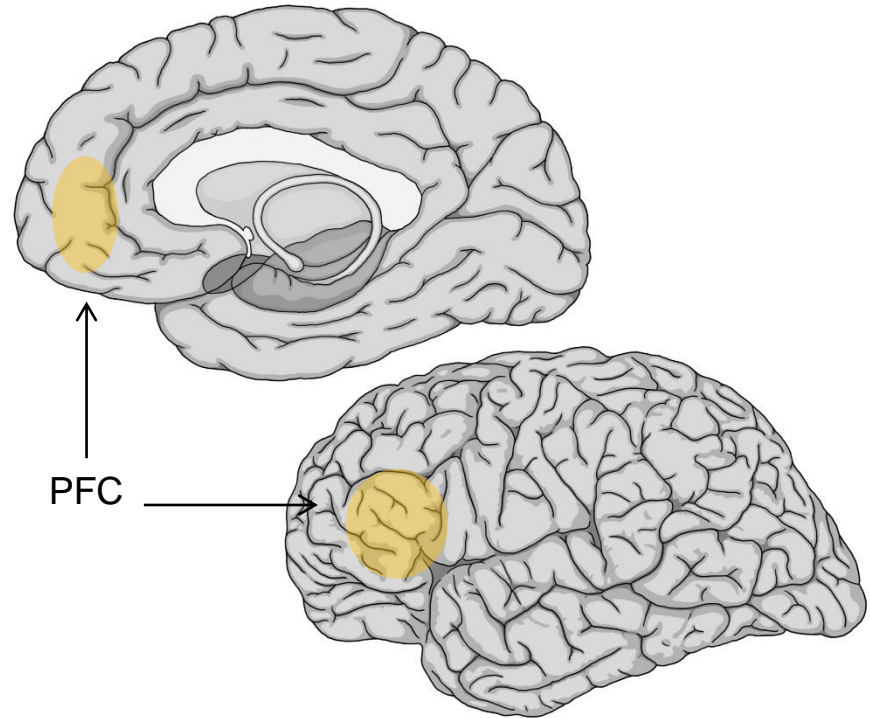
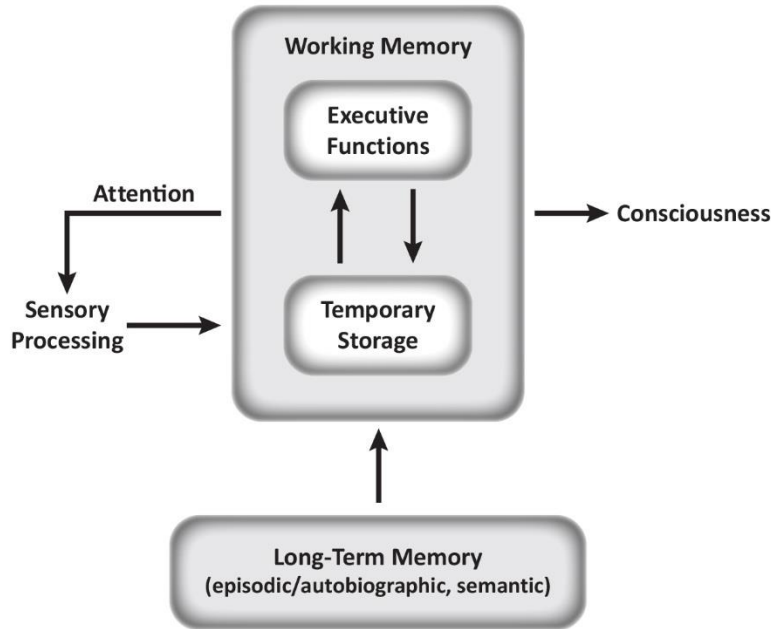
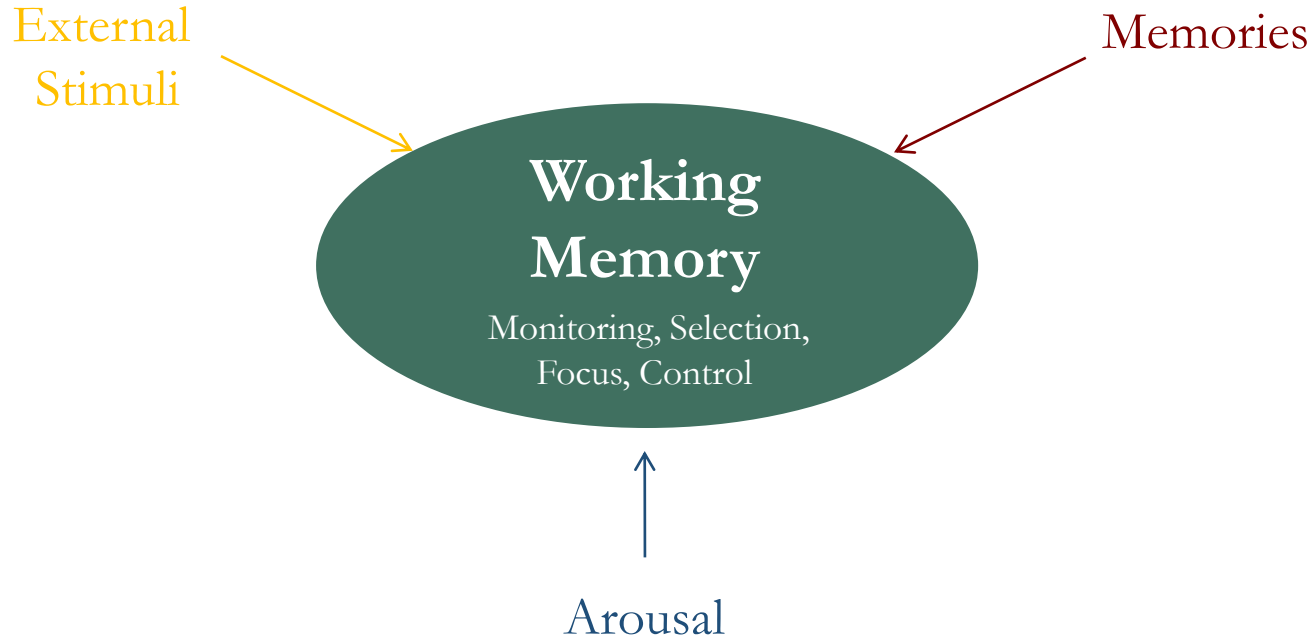


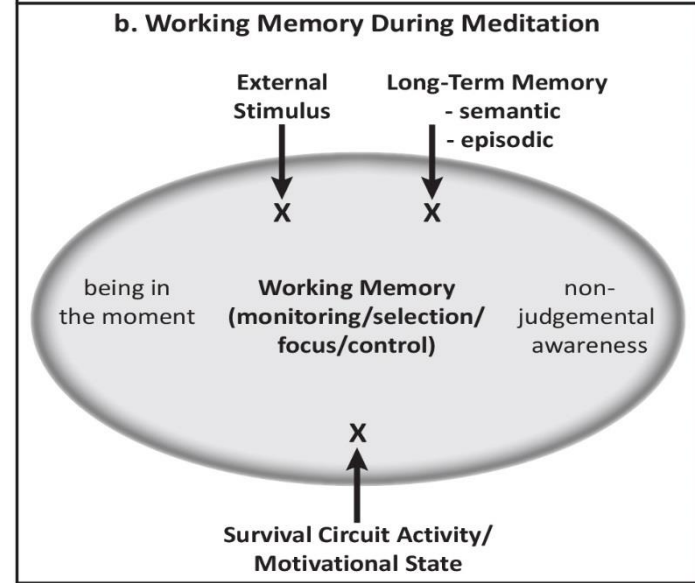
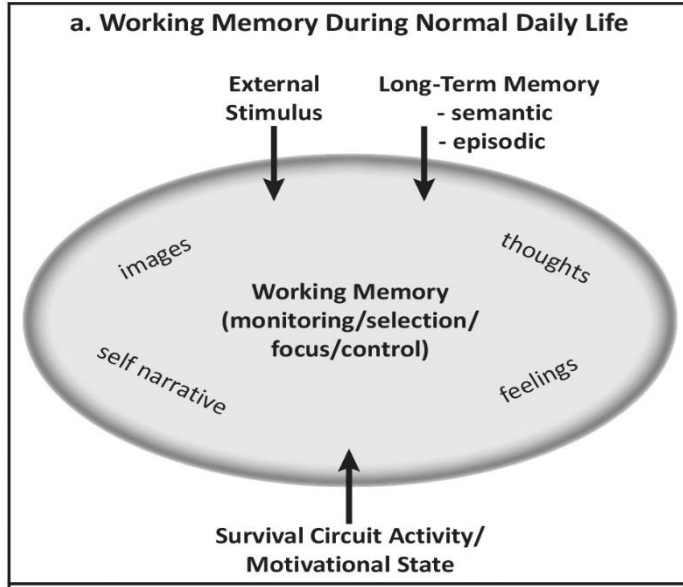
Figure 6.2
Working Memory and Consciousness



Forces competing for Working Memory resources

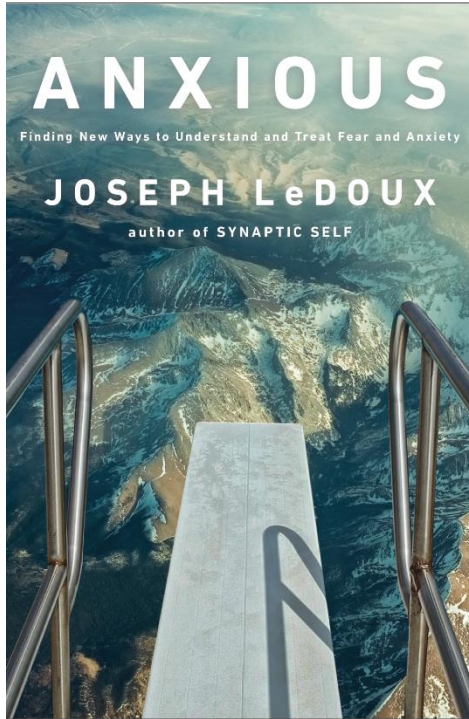


Meditation and Working Memory



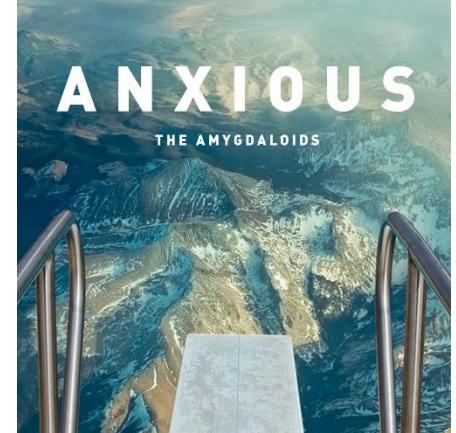
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