

M-F Brain Differences— in Reaction to Stressors

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Brain References
www.ArleneTaylor.org
www.LLM.life



The absence of stress—the ability to adapt and make changes—is death

Three main categories of stress:

- 1. Eustress: Positive (helps you grow)**
- 2. Distress: Negative (avoid when possible)**
- 3. Misstress: Hidden (may be unrecognized)**

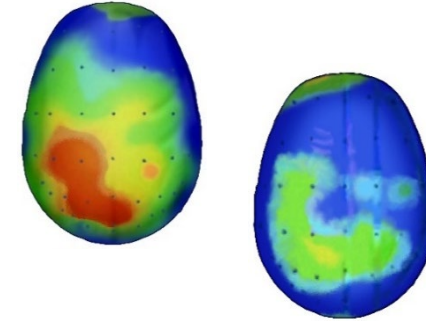


Unmanaged distress and misstress can kill brain cells (especially lethal in the hippocampus) and damage body organs

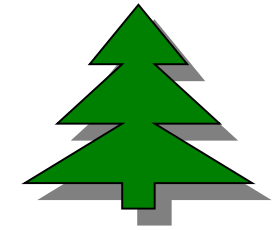
Every brain is unique—every thought changes your brain and every brain thinks different thoughts—so stress is a relative concept

Stress reactions typically:

- **Are learned (often in childhood)**
- **Relate to perception and flexibility**
- **Stressors may involve anger, fear, sadness, a sense of being different, disenfranchised, unaccepted, marginalized, abused, etc.**
- **Healthier responses can be learned**



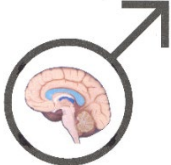
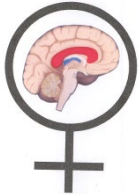
Stress reactions often relate to personal flexibility—trees that cannot flex with the wind are at high risk of being uprooting



Males and females may find some stressors more problematic than others:

- **Males: work issues, unemployment, being fired, bankruptcy, separation, and divorce**
- **Females: conflict, serious illness, separation and death within their proximal social network (child, parent, spouse, close friend...)**

While all brains need effective stress-management strategies, studies have shown that the brain responds differently to stressors based on gender

- **Male brains appear to struggle less with stress in the present moment but are at an increased risk for a stress-related depressive disorder later in life** 
- **Female brains tend to struggle more with stress in the moment and are twice as vulnerable to stress-related disorders such as PTSD and depression** 

The brain is the first body system to recognize a stressor and it reacts with split-second timing (liquid crystal processors versus solid crystal processors)

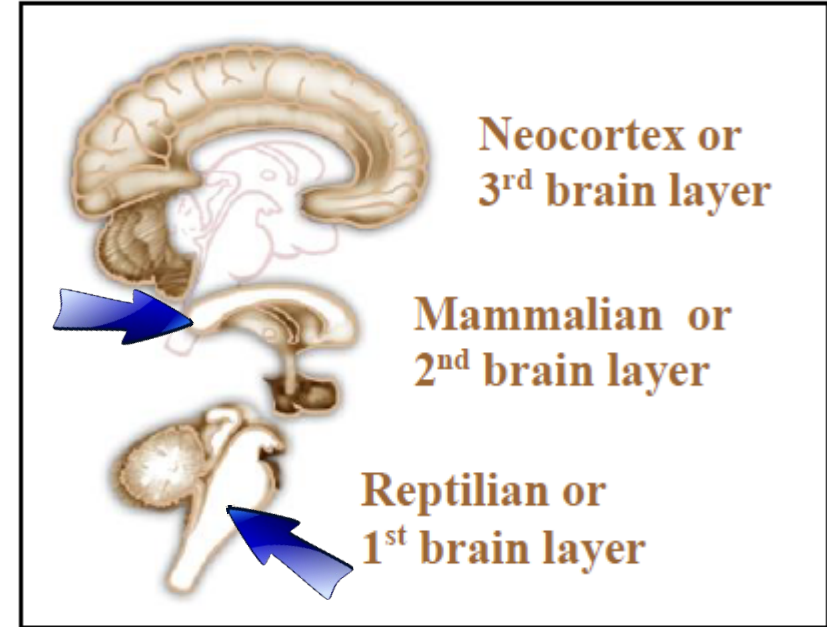
It can stimulate a stress response for up to 72 hours after a stress event (real or imagined) or even longer if you keep rehearsing the event to yourself and/or to others

Chronic secretion of stress chemicals and Hormones can suppress the immune system, contribute to illness and disease, and shorten one's life



When you perceive a stressor, the hypothalamus in the Mammalian or 2nd brain layer triggers the secretion of CRF or Corticotropin Releasing Factor

Both a neurotransmitter and a peptide hormone, CRF binds to receptors on cells in the locus ceruleus, an alarm center deep in the brain stem of the Reptilian layer



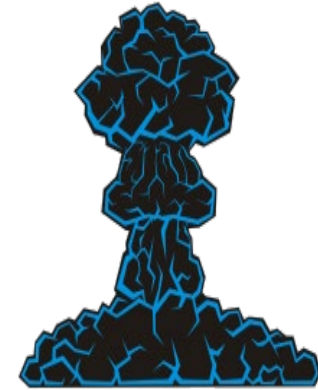
—Molecular Psychiatry (report)

The release of CRF is telegraphed throughout the brain via norepinephrine (also a hormone and a neurotransmitter), which influences sleep and alertness and is believed to be correlated with the Fight-Flight stress response



This news flash creates a heightened emotional arousal throughout the brain—hyper-arousal can be helpful for brief periods but not if it becomes chronic—runaway CRF is a core feature of depression

- **Can suppress appetite and may be linked with anorexia nervosa**
- **Can increase subjective anxiety that may contribute to depression**
- **Is linked with euphoric feelings that accompany alcoholism**
- **Triggers inflammation, a process that may underlie Multiple Sclerosis, arthritis, and other chronic illnesses**
- **High levels of CRF have been found in the cerebrospinal fluid of individuals who had major depression and in those who committed suicide**



Rats make good research subjects

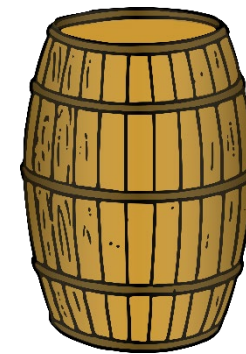
- **Under a microscope it is almost impossible to differentiate between rat and human neurons**
- **At least 30 rat and human peptides are identical—some are hormones, some neurotransmitters, and some are both; they all impact mood**
- **Rats can be trained to do cognitive tasks and neural activities linked with specific tasks (e.g., mazes, distinguishing between scents)**



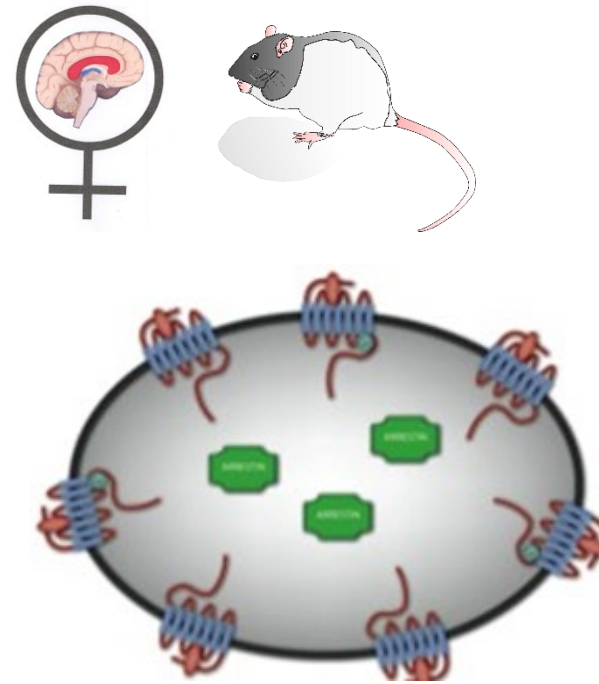
Researchers studied how the neurons in the brains of male and female rats handled stress

On average—

- The rats could swim in a vat of water for up to 48 hours
- The brains of male and female rats responded quite differently to the stress of swimming, however



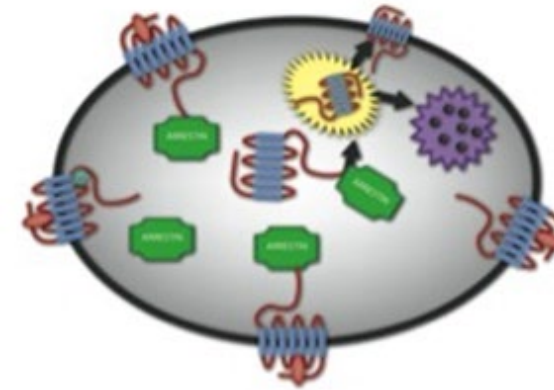
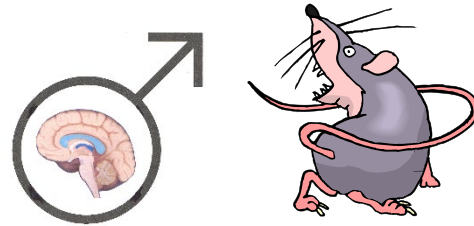
In the stressed female rat, the brain acted *macho*—all CRF receptors stayed open on cell surfaces, which allowed CRF to enter the cell freely (metaphor: all windows are open, letting in the storm easily)



Female rat neuron

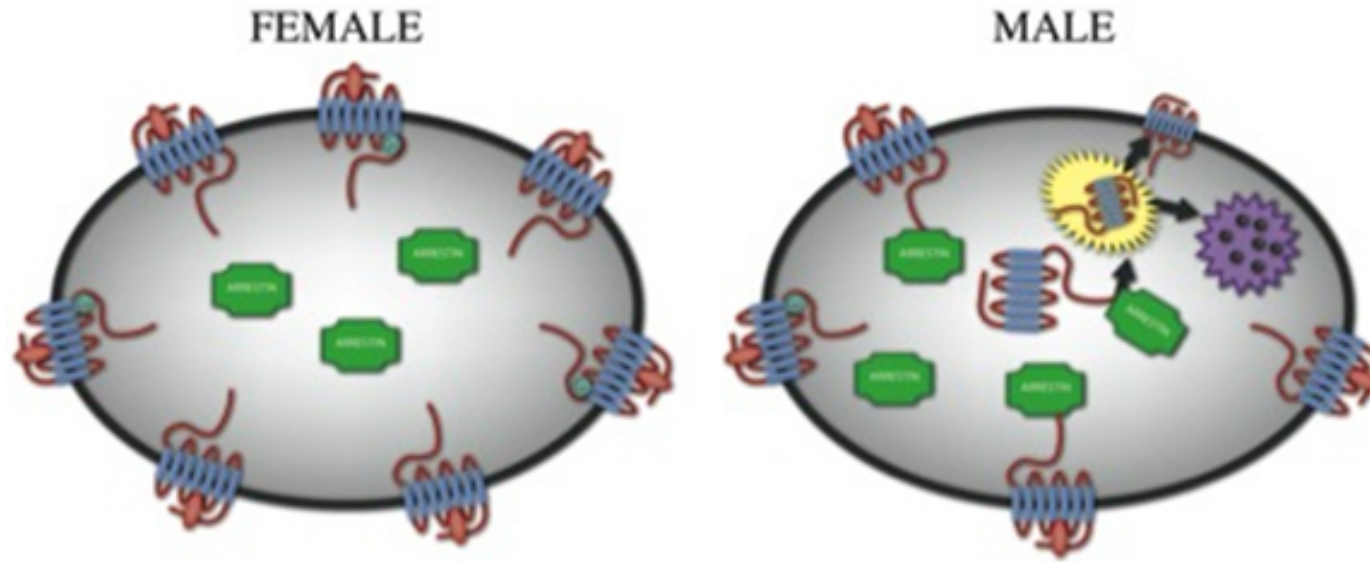
This increased CRF binding heightened the brain's stress reactivity

**In the stressed male rat brain, internal proteins called arrestins (green) helped
Some CRF receptors retreat
inside the cell so less CRF
could freely enter
the cell**



Male rat neuron

**Metaphor: arrestins closed half the windows—this
process, unique to the male brain, toned down the
neuron's stress sensitivity due to less CRF being taken
into the cell**



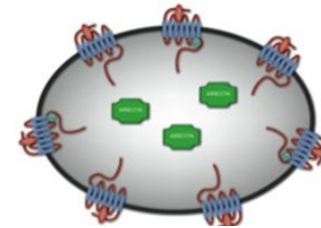
Receptors (blue) on cell surfaces stay open , which increases CRF binding and stress reactivity

Arrestins (green) help some receptors retreat inside the cell, which decreases CRF binding and stress reactivity

http://www.nimh.nih.gov/science-news/2010/stress-hormone-receptors-less-adaptive-in-female-brain.shtml?WT.mc_id=twitter&sms_ss=email

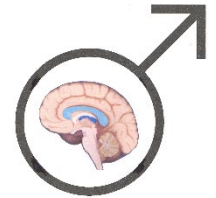
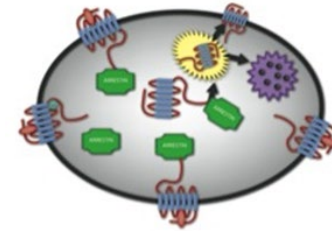
Lack of receptor internalization in the female brain could translate into impaired ability to cope with high levels of CRF, as occurs in depression and PTSD—making the stressor seem even worse

The female alarm system is more sensitive to stressors and to CRF, period; even in the absence of stressors, the female stress signaling system is more sensitive from the start



—Debra Bangasser PhD

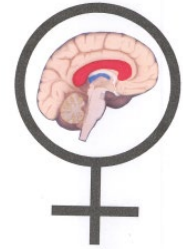
Increased receptor internalization in the male brain could translate into enhanced ability to cope with high levels of CRF—causing the stressor to seem less intense or problematic in the present moment



However, it is possible that the less-intense stress response in the present moment may be more problematic over time, increasing the male brain's risk for a Major Depressive Episode (MDE) 25 years later

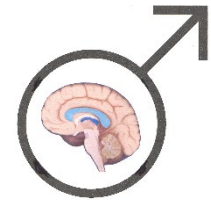
University of Michigan, Ann Arbor: Researchers studied Stressful Life Events (SLE) and the Risk of a Major Depressive Episode (MDE) 25 Years Later

The data were broken out by gender and by race



There was no difference for risk of a MDE based on race for females (women tend to use coping strategies such as relational connections, faith, social support networks, spirituality and/or religion, and emotional expression)

Black-White Paradox: Researchers found a stronger predictive role of SLEs and risk of MDEs for white males compared with black males 25 years later



Despite higher levels of exposure to SLE, black males have disproportionately lower rates of depression—black males may have a higher tendency to implement adaptive coping strategies, including positive reappraisal and maintenance of hope and optimism

journal.frontiersin.org/article/10.3389/fpubh.2016.00049/full

Stressors interact with the brain in a predictable equation: only 20% of any negative impact to your brain and body is due to the stressor event; 80% is due to your perception of the event and the weight you give to it

It's not so much what happens that matters as what you think about what happens

—Epictetus, 2nd Century Greek Philosopher

Be anxious for nothing

—Apostle Paul - Philippians 4:6-8



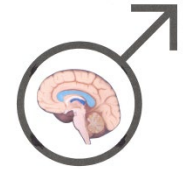
Live the 20:80 Rule: even when you can't do anything about the 20%, you can do almost everything about the 80% because you create your own perceptions

Researcher Shelley E. Taylor recommends identifying your GMM or gold medal moment—says everyone has at least one



When you recognize a stressor or perceive a negative interpretation of the event, recall your GMM, which can help you manage the 80%

Recognize your tendency to under- or over-react and avoid making disparaging remarks related to male-female differences



Collaborate to find middle ground and appropriate responses and strategies to manage stressors

Study what the other gender does well and implement a version that works for you



Realize that increased knowledge, practically applied, can result in enhanced communication—and more fun

Drive carefully, especially when you are coping with stressors—it's not only cars that can be recalled by their maker

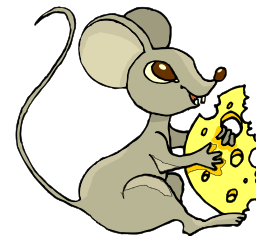


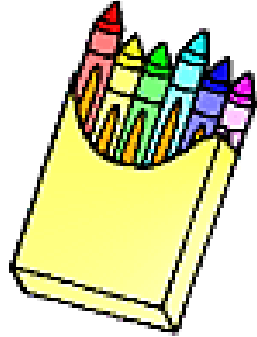
Be careful what you say during episodes of high stress—if you can't be kind, be silent, or at least have the decency to be vague

Never put both feet in your mouth at the same time, or you won't have a leg to stand on

Birthdays are very good for you—the more you have, the longer you live so learn to enjoy them

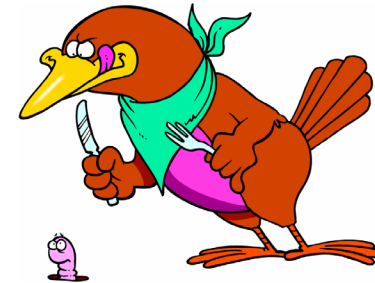
Stop the mad competitive rush—it's the second mouse that gets the cheese





Learn from crayons. Some are sharp, some are pretty, some are dull, some have weird names, and all are different colors—but they all have to live in the same box

Sleep late whenever possible—it's the early worm that gets eaten by the bird





**Accept that some days
you're the pigeon and some
days you're the statue—
practice mirthful laughter on
the days that you're the
statue . . .**



**The truly happy—and typically low-stress
personality—is the one who can actually
enjoy the scenery on a detour**

The End—

