

Stress, Cognition and the Brain

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Outline

- 4.5. Stress Mitigation
 - 4.5.1. Stress, cognition and dementia
 - 4.5.2. Physiological effects of stress
 - 4.5.3. Stress reduction techniques and their effects on cognition

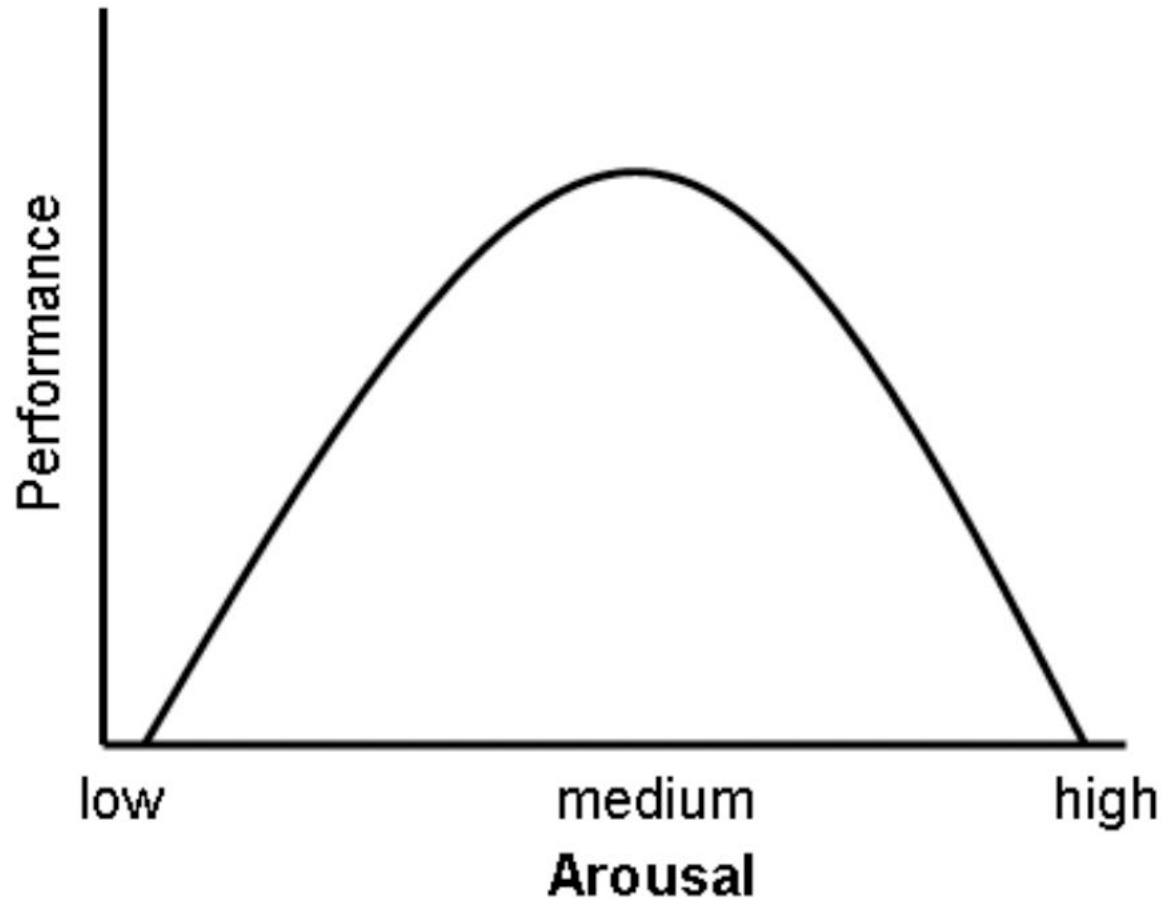
Good News and Bad News

- First the bad news, research shows that stress levels have increased significantly among adults in the past few decades.
- Now the good news, research also shows that as adults get older, from young adulthood to middle adulthood to and older adulthood, stress levels actually decrease.

Stress and Cognition

- Sometimes mild stress can be good in that it motivates us. For example, stress might motivate us to get something done before a deadline.
- But if the stress is too great (and that can be in the eye of the beholder) it can negatively impact our performance and health, including our brain health.

Yerkes-Dodson Model



Stress and Cognition

- What is stressful to one person might be enjoyable and non-stressful to someone else.
- For example, stress can negatively impact memory and cognitive ability.

Daily Stress and Memory Problems

A recent study followed middle aged adults, over a ten year period of time. People who experienced more daily stress and hassles, during the 10 year period, had developed more memory impairment by the end of the study.

Mild Cognitive Impairment

- Other studies have found that experiencing more stress is associated with a greater chance of developing mild cognitive impairment, which can be a precursor of dementia.

Stress Releases Cortisol

- Cortisol is a stress hormone:
 - Impairs immune functioning
 - Causes us to retain fat around the mid-section
 - Possibly damages cells at higher levels
 - And, impairs memory

Cortisol and Memory

- Flight non-attendant study

So, how do we reduce stress?

- Mindfulness training or meditation shows a lot of promise.
- Mindfulness has been associated with:
 - reductions in perceived stress (a recent study found a 55% reduction!)
 - reductions in self-reported negativity
 - better overall mental health
 - A 14% reduction in depressive symptoms in older adults, relative to a control group

Meditation

Meditation is a wonderful way to gain better control of thoughts and therefore control anxiety and reduce stress. There are many forms of meditation and many books and articles give advice about how to meditate. One goal of meditation is to quiet both the body and the mind.

Both Aerobic Exercise and Mindfulness Training Reduced Stress

- Researchers at UC Berkeley and Stanford looked at people who had social anxiety, researchers found that either aerobic exercise or mindfulness training was effective at reducing people's stress levels.

Stress and Inhibition

- One cognitive ability is inhibition (i.e., not doing or thinking something).
- If people can inhibit thinking about a stressful situation that can reduce its effect.
- Inhibition could also reduce the mental interference or distraction that thinking about a stressful situation can cause when trying to learn or remember something.

Stress and Inhibition

- There is a relationship between the impact of stressful situations based on executive functioning and inhibition abilities.
- What is one of the most researched ways to improve executive functioning and inhibitory abilities?

Physical Exercise and Activity

One of the most immediate and effective ways to reduce stress is to exercise. Exercise helps to metabolize and eliminate the chemical byproducts of stress, and can lead to the release of endorphins, which can make a person feel better. In addition, exercise can improve mood, raise confidence, and help alleviate anxiety.

What are other ways we can deal with stress?

Yoga. There are many different types of yoga, but they generally help train people to better control both their minds and bodies. Yoga that is frequently practiced in western culture generally focuses on stretching and breathing. This is a great way to gain better control of one's thought processes.

What are other ways we can deal with stress?

Take a deep breath. One way to refocus one's attention and relieve stress is to simply take a few deep breaths. In addition, one may try diaphragmatic breathing, which can be a great way to relieve stress.

What are other ways we can deal with stress?

Here are instructions for a common diaphragmatic breathing exercise:

1. Sit or lie comfortably, with loose garments.
2. Put one hand on your chest and one on your stomach.
3. Slowly inhale through your nose or through pursed lips (to slow down the intake of breath).
4. As you inhale, feel your stomach expand with your hand. If your chest expands, focus on breathing with your diaphragm.
5. Slowly exhale through pursed lips to regulate the release of air.
6. Rest and repeat.

What are other ways we can deal with stress?

Reduce exposure to stressful situations. One obvious way to reduce overall stress in anyone's life is to simply reduce one's exposure to situations that are stressful.

Other Ways to Reduce Stress

Stretch

Take a warm bath

Stand up and smile

Sleep

Learn to say “no”

Switch to decaffeinated beverages (do so gradually if you consume a lot of caffeine)

If things are out of your control, admit that and accept it

Eat healthier food

Listen to your favorite music

Look at photos of family and friends

Organize your time

Make a list of things that need to be done

Talk to a friend

Other Ways to Reduce Stress

Take a nap

Read a book

Watch a television show or movie

Make two lists, one that contains all the stressors you can change and another of the stressors you can't change. Determine to change what you can and not worry about what you can't change.

Try using the aroma therapy oils, especially those that are calming, such as basil, bay, chamomile, eucalyptus, lavender, peppermint, rose, and thyme

Recognize that life is a work in progress and that not everything will be done exactly as you had hoped or planned.

Don't avoid doing things that need to be done as a way of reducing stress, as recent research shows that can increase stress in the long run

Up Next

Next, we will discuss *Additional Lifestyle Factors and the Brain*.