

# The Empowerment through Science & Technology Initiative (ESTI)

OUR GOAL IS TO PROVIDE YOU WITH ACCURATE  
INFORMATION ON SCIENCE, TECHNOLOGY, AND  
HEALTH.

## Get In Touch

Are you interested in learning how to use your technology?

At ESTI, we're hoping to start online workshops on how to use specific technologies and get the most out of your products. If this is something you'd be interested please fill out this survey ([https://cutt.ly/ESTI\\_survey](https://cutt.ly/ESTI_survey))!

Participate in a study about how COVID-19 and the public health crisis impacts out behavior. Please visit this site ([www.colelab.org/covid.html](http://www.colelab.org/covid.html)) for more information, and check out this infographic ([https://cutt.ly/study\\_info](https://cutt.ly/study_info)) on how to sign up.

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# MYTH BUSTERS

Sources:

1. <https://www.brainfacts.org/core-concepts/how-experience-shapes-your-brain>



## TRUE: Life Experiences Changes the Brain

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The experiences that will accumulate over the course of our life is a very important factor in our brain development and plasticity. There are two known types of brain plasticity: (1) structural plasticity, and (2) functional plasticity. Structural plasticity refers to memories or experiences that change the physical structure of the brain (e.g., brain volume). While functional plasticity refers to when brain functions move from a damaged area to an undamaged area (e.g., someone who suffered from a stroke learning to talk again).

When we're born, there are approximately 2,500 synapses in our brain. By the time we reach the age of three, that number grows to approximately 15,000 synapses per neuron. However, by the time we're adults, that number is almost cut in half. This is because as we gain new experiences and learn new things, our brain strengthens some synapses and gets rid of others (use it or lose it!).

In the case where someone suffers brain damage either from a physical or internal incident (e.g., stroke or aneurysm), the brain may be able to direct functions from the damaged area to an undamaged area. This usually involves the individual practicing a function, like walking, again like a baby. This is the brain strengthening those synapses in the face of injury. However, this does not mean that the brain is invincible. There are cases where the brain cannot fully regain functions depending on the area that is affected.



# Neuro News

Sources:

1. <https://fs.blog/2015/08/how-to-think/>

## Multitasking & Thinking Better

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From early childhood into young adulthood, we're taught all sorts of topics/ideas in school. But one important concept that is not taught is how to think. Thinking is more than having a conversation with yourself. Thinking enables us to make decisions before we act and gives us the chance to look at a problem or situation carefully before coming to a decision. By thinking better, we are not only making better decisions, but we're also saving time – time that would've been spent fixing the mistakes we would've made.

One strategy that many people use is multitasking. However, this strategy impairs our ability to think. Even though it may feel like we're getting multiple tasks simultaneously, what we're actually doing is switching between tasks. Every time we switch to a different task, our brain takes time to adjust to what the new instructions are, this results in a slower working pace, and a more likely chance of making mistakes. Additionally, multitasking impairs our executive functions. Our executive functions are the ones that control and manage cognitive processes and determine how, when, and in what order certain tasks are performed.

Here are some strategies to break the multitasking habit:

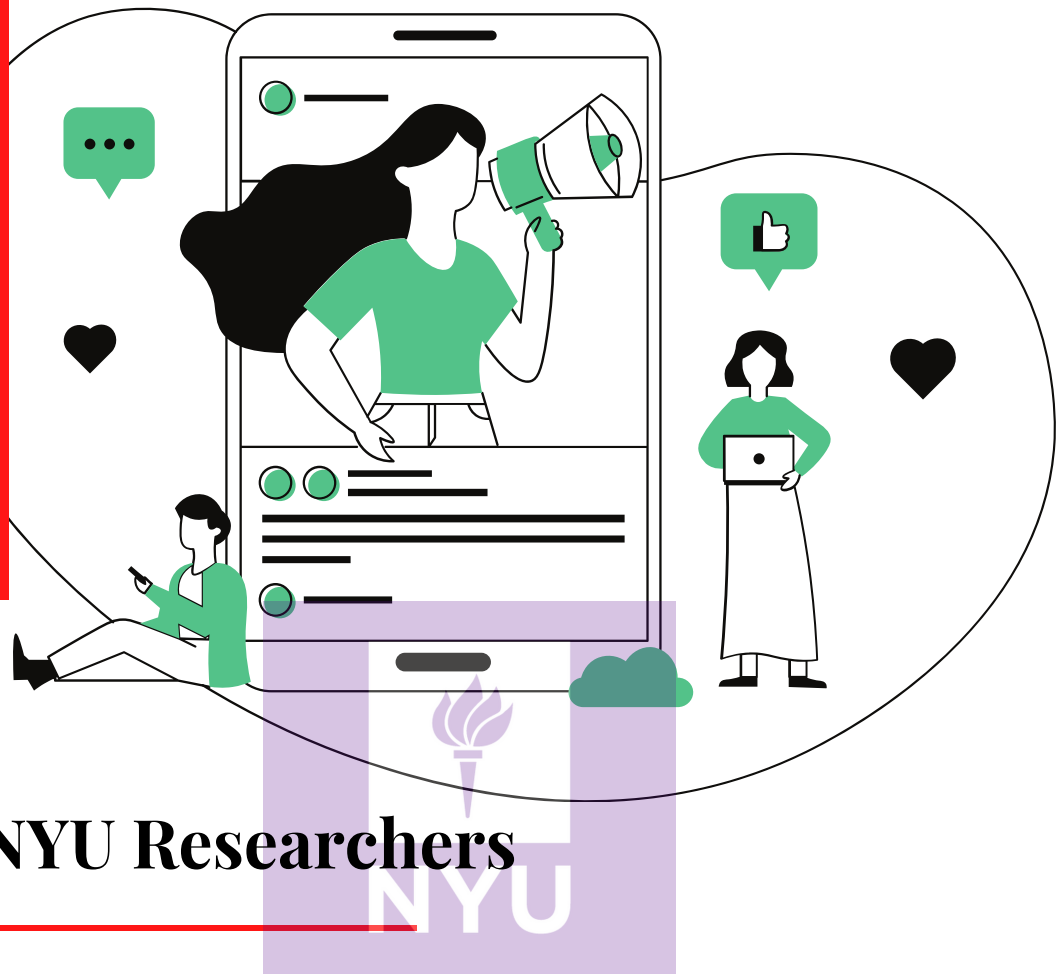
- Limit the number of things you juggle at any given time to just one task
- Use the "20-minute rule"
- Batch your tasks
- Limit distractions
- Practice mindfulness



# Tech News

## Sources:

1. <https://www.theverge.com/2021/8/6/22613525/facebook-nyu-research-ban-cambridge-analytica-platformer>



## Facebook VS NYU Researchers

The Ad Observatory project was created by researchers at New York University with the intention of understanding how Facebook may have determined the 2016 elections through political ads on its platform. This not only helps us understand the 2016 elections, but also how social media platforms can determine political elections.

However, in October 2020, Facebook sent out a cease-and-desist order to NYU researchers for the browser extension created to collect data about the ads you see on Facebook, including information about how these ads are targeted. Additionally, Facebook also disabled the pages and personal accounts of the NYU researchers involved in the project. This has created even more tension between the two.

Facebook on the other hand has more reason to be cautious about NYU researchers collecting this kind of data from their platform – a repeat of the Cambridge Analytica scandal. Facebook claims that the browser extension has some vulnerabilities. For instance, if an individual pays to boost a post, such as for a fundraiser, information including that user's name and photo may end up being collected.



# This Month in Science

Sources:

1. <https://www.nature.com/articles/d41586-021-02158-6>

## COVID-19 Vaccine Boosters

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With the Delta variant on the rise, researchers are looking into vaccine booster shots to keep those who got vaccinated safe from the Delta variant or any other variants that may arise.

But how do booster shots work? Typically, when you're given a vaccine, after the initial symptoms have gone away, there are antibodies left behind that remain in the body in case of future infections. However, after a certain amount of time, these antibodies may lessen because of many different factors (e.g., being more exposed to illness, variants that are less susceptible to the vaccine). This is where the vaccine booster comes into play: the booster would increase those levels of antibodies and give an individual more protection. This also promotes a process called "affinity maturation." This means that antibodies would travel to the lymph nodes and gain mutations that would make the antibodies they produce bind to pathogens more strongly, potentially enhancing their potency.

However, some researchers think that it's too early to consider booster shots for a couple of reasons. (1) Not everyone has gotten the vaccine. This allows for COVID-19 to continue spreading and continue evolving. Therefore, instead of using resources for creating a booster, those resources should be placed towards getting everyone vaccinated. (2) Since there is a lack of evidence around booster shots, researchers are not sure who would benefit from it. Since not everyone has gotten the vaccine, it's difficult for researchers to understand who should be getting the booster shot. Even though the efficacy of vaccines has dwindled, researchers need more data in order to understand the cause of this reducing efficacy.

Getting vaccinated is the first step to stopping the spread. If you need assistance making your vaccine appointment, give us a call at 973-353-2706.



# Health

## Sources:

1. <https://www.scientificamerican.com/custom-media/mending-mind-and-body-diabetes-heart-disease-and-mental-health/?mvt=i&mvn=52fc587c97b04f30a025051b82f5b0b6&mvp=NA-SCIEAMERLIVE-11237933&mvl=HomeAgenda>



## The Connection Between Mind and Body

Chronic diseases such as diabetes, not only affect our physical conditions but also our mental conditions as well. Patients with chronic diseases typically must make major lifestyle changes that may seem intimidating and impossible to live a healthier life. Thus, many patients with chronic diseases also suffer from depression and anxiety, which leads to worsening physical conditions.

When patients are first diagnosed with a chronic disease, they experience two big emotions: helplessness and hopelessness. This stems from a pressure to manage/change your lifestyle habits and dealing with friends and family. When patients don't speak about those feelings, it's harder for them to practice a healthier lifestyle because of fear of the unknown.

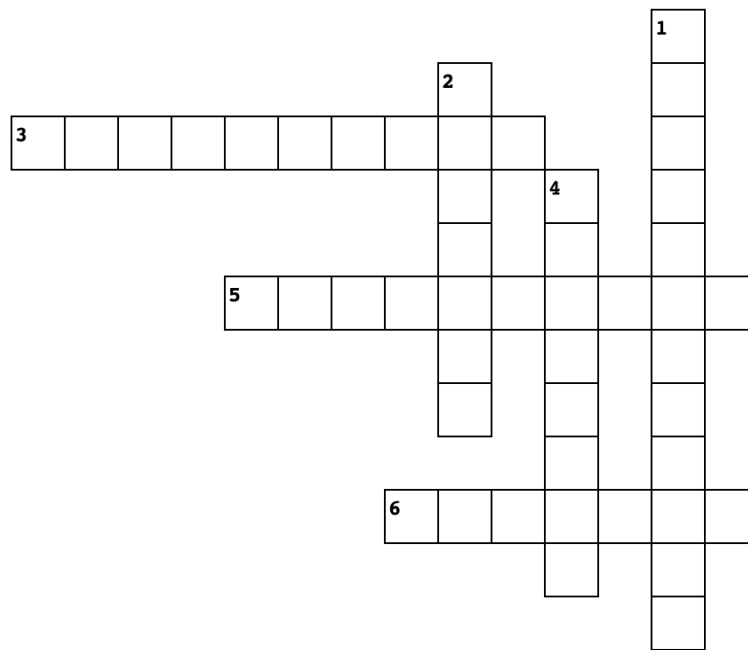
To combat this, medical professionals should practice empathy, transparency, and promote an open dialogue with their patients. If medical professionals give a safe space for patients to talk about both their physical and mental struggles, it is more likely that patients will overcome those feelings of helplessness and hopelessness, and lead a happier and healthier life.

# ESTI

## Crossword

**Reinforce what you've  
learned!**

ESTI: September 2021



### Across

- 3.** A common and serious medical illness that negatively affects how you feel, the way you think and how you act.
- 5.** The ability of the brain to change through growth and reorganization.
- 6.** A human health condition or disease that is persistent or otherwise long-lasting in its effects or a disease that comes with time.

### Down

- 1.** The strategy of switching between tasks.
- 2.** A shot that increases the number of antibodies after already being vaccinated.
- 4.** A social media platform that is involved in a dispute with NYU researchers.

