

1. **Mark your confusion.**
2. **Show evidence of a close reading.**
3. **Write a 1+ page reflection.**

8 Fascinating Things We Learned About The Mind In 2015

Memory erasing is just the beginning.

Source: Carolyn Gregoir/huffingpost.com, December 26, 2015

As the New Horizons spacecraft made its historic flight to Pluto and some scientists explored the far reaches of our solar system, others were making some incredible advances in their exploration of the inner workings of the mind. Studies published this year shed light on the mysteries of the brain and human behavior, and began paving the way for new treatments to mental and neurological health problems, ranging from addiction to autism to Alzheimer's disease.

Here are eight fascinating things we learned about the human mind in 2015:

1. Smartphones are wildly distracting.

Americans are spending more time than ever looking at screens, and we're only beginning to learn how this is affecting our brains.

Just hearing your smartphone vibrate is enough of a distraction to significantly impair focus and productivity, according to a Florida State University study published in August.

Another recent study found that heavy smartphone users are more prone to experiencing "cognitive failures" arising from forgetfulness, inattention and a lack of awareness of one's surroundings, including things like missing appointments, walking into people and forgetting things.

"The Internet is great, mobile phones are great, but there is a point at which we need to sit back, log off and really start to think about how technology is impacting on our capacity to focus," said Dr. Lee Hadlington, a psychologist at England's De Montfort University and the latter study's lead author. "We are always eager to get the new piece of tech -- but not to think about its underlying consequences to our cognitive capabilities."

2. Psychedelics may be the next big thing in mental health care.

We witnessed a renaissance in psychedelic research this year. A review of studies on the therapeutic applications of psychedelic drugs, published in September in the Canadian Medical Association Journal, showed that psychotherapy assisted by substances such as LSD, psilocybin (hallucinogenic mushrooms) and MDMA (the active ingredient in Ecstasy) holds promise for treating mental health issues including post-traumatic stress disorder, addiction, end-of-life anxiety and depression.

"The studies are showing big effects," Dr. Matthew Johnson, a behavioral pharmacologist at Johns Hopkins University and one of the study's authors, told HuffPost. "The exciting thing isn't just that these drugs work for something that we already have treatment for. It's that they're getting big effects on disorders for which we have very poor treatment."

3. Pollution is worse for the brain than we realized.

Just months before the world looked on in horror at Beijing's "airpocalypse," research found that exposure to air pollution can speed up brain aging, and may contribute significantly to neurodegenerative diseases including Alzheimer's and Parkinson's.

The study showed that small increases in exposure to pollution were associated with decreases of white matter in the brain -- in other words, exposure to environmental toxins was "shrinking" the brain.

"The evidence so far suggests that pollution could be the most pervasive potential cause of brain disease that scientists have ever discovered," science journalist Aaron Reuben wrote in Mother Jones in May.

4. The brain and immune system are actually linked.

This year, University of Virginia neuroscientists uncovered a previously unknown direct connection between the brain and the immune system -- a network of lymphatic vessels that previously had only been found to exist below the base of the skull, but were observed for the first time in the brain.

"When we discovered the lymphatic vessels, we were very, very surprised, because based on the textbooks -- these vessels do not exist," the study's lead author, Dr. Jonathan Kipnis, told HuffPost in June.

The finding could have significant implications for the treatment of brain disorders involving inflammation, such as Alzheimer's disease, multiple sclerosis and autism.

5. Erasing memories could be the future of addiction treatment.

Scientists hacking into the brain to erase or transplant memories is no longer just the stuff of science fiction. Memory erasure may soon be a reality, and it could help us better treat drug addiction by targeting drug-related memories.

Landmark research from the Scripps Research Institute that was published in the journal *Molecular Psychiatry* identified a new drug that has the potential to selectively erase dangerous addiction-associated memories in people addicted to meth.

"When the person is in-patient, they'd use this treatment once and it would target those drug-associated memories that could be triggers for them," Dr. Courtney Miller, one of the study's authors, said in August. "Later on, when they're back in the real world, the memories wouldn't serve as triggers because they'd be gone."

6. Nature does the mind good.

We already knew that spending time in the great outdoors comes with significant physical and mental health benefits, but this year, researchers found that the psychological benefits of nature extend even further than we realized.

Research from Stanford University that was published in July found that outdoor strolls reduced the sort of obsessive, negative thoughts that characterize depression.

Another study published last month found that spending time in nature could also have therapeutic applications for addiction, and linked exposure to nature with reduced impulsivity and improved self-control.

"A nature-based treatment component may be a valuable addition to standard therapies for individuals struggling with substance abuse," Dr. Meredith Berry, a psychologist at the University of Montana and the study's lead author, told HuffPost.

7. To boost your mood, boost your bacteria.

The brain-gut connection has been another major theme in neuroscience and psychology research over the past couple of years. This year, research found that increasing the balance of healthy bacteria in the gut can help to reduce anxiety and also to lessen symptoms of depression.

One study showed that people who have more fermented foods in their diet -- which are filled with healthy bacteria known as probiotics -- exhibit less neuroticism and social anxiety.

"It is likely that the probiotics in the fermented foods are favorably changing the environment in the gut, and changes in the gut in turn influence social anxiety," Dr. Matthew Hilimire, an assistant professor of psychology and one of the study's authors, said in a statement in June. "I think that it is absolutely fascinating that the microorganisms in your gut can influence your mind."

8. Good sleep is critical to a healthy emotional life.

It's well-established that good sleep is crucial to psychological well-being -- and that sleep deprivation, on the other hand, raises stress levels and has been linked with anxiety, depression and other mental health problems.

A landmark study published in July in the *Journal of Neuroscience* found that good sleep is also a key component of emotional intelligence. The researchers showed that losing sleep dulls our ability to read facial expressions, which is an important component of emotional intelligence. On the bright side, dreaming actually boosts this ability, the researchers found.

"It's almost as though, without sleep, the brain... was unable to put emotional experiences into context and produce controlled, appropriate responses," Walker said in a statement when the study was published. "Emotionally, you're not on a level playing field."

Possible Response Questions:

- Which of the brain discoveries discussed above do you find most interesting? Explain.
- Pick a passage from the article and respond to it.