
The Impact Of School Stressful Experiences On Dreams

School's always been called a "waking nightmare", but has it ever been a sleeping nightmare? Admit it, you've woken up from a nightmare about that one (or two) freshman year class you absolutely bombed. It's not just you. Nightmares can occur due to traumatic, stressful experiences, and at Horace Mann, often times, academic pressure is a stressful experience. Stressful experiences like these can cause your brain to subconsciously obsess over your past memories, through the process of dreaming.

Dreams are a collection of images, events, people, and scenes we've encountered throughout our day. Some oneirologists, neurologists who study dreams, theorize that dreams help process emotions, physical details, and events your brain collected throughout the day. Most people dream 3-6 times a day (about 2 hours total) but don't remember it. The dreams that they do remember are usually the most intense, irrational dreams, occurring during REM phases of sleep.

There are two main phases of sleep: Rapid Eye Movement (REM) and Non-Rapid Eye Movement (NREM). When you first fall asleep, you enter NREM phase. Your brain then starts its REM phase approximately 60 minutes after sleep, stays in this phase for 10-15 minutes, and returns to NREM before starting the REM cycle again. Most crazy dreams occur during REM phases while rational dreams occur during NREM phases. For example, the dreams where basic law of physics don't work, causing you to fly, move through walls, or walk on water, occur during REM phase. On the other hand, NREM dreams are rational, episodic recountings of your daily memories. Usually, you only remember REM dreams. According to T. A. Nielsen, the recall rate of dreams occurring during REM cycles is 81.8% compared to the 50% rate of those occurring during less intense sleep cycles. You are more likely to remember REM dreams than NREM dreams, because your brain is most active during REM phases. During the REM phase, levels of acetylcholine, a neurotransmitter that sends signals to other parts of your brain and body, are at their highest, meaning that your brain is almost as active as when you're awake. Your heart rate increases to almost the rate it is when you're awake, your muscles paralyze, and your brain activity increases, making you more likely to dream. The complete opposite occurs during NREM phases; your heart rate drops, and cognitive brain activity decreases to focus your energy on muscle repair.

Jessica D. Payne and Lynn Nadel believe that memory consolidation influences the difference in recall rates for REM and NREM dreams. There are two systems in which your memory is stored: hippocampal and neocortical. Hippocampal systems store memories that are unique occurrences. Neocortical systems store overlapping occurrences, or anything repetitive happening throughout your day (i. e. typing, walking, blinking, the sky, etc.). These two systems then work well together to store information you'd later find important or unimportant. First, certain neocortical memories can gradually fortify details about the things, people, and events you interacted with that aren't too different from your daily routine. Second, certain hippocampal memories are also strengthened to focus on specific encounters, unique interactions, and backstories behind their occurrence. Third, the connection between the hippocampal and neocortical sites are enhanced so that hippocampal memories can be properly recalled with even the most trivial details, even after a long time. Fourth, similar neocortical

memories are connected so that even if you can't remember the specific details of each memory, you can feel a similar emotion from the series. Thus, a functioning connection between hippocampal and neocortical categorize the multitude of experiences constantly flowing through your brain.

So how does this all play into dreams? Payne and Nadel state that high amounts of cortisol can break the connection between hippocampal and neocortical structures. Cortisol, a stress hormone, plays a significant role in how your brain consolidates its memories. Remember the first time you got low grade in freshman year? You can remember that spine-chilling moment because the event was so stressful. Cortisol has the same effect on hippocampal and neocortical connections. During REM stages, cortisol increases drastically. When there is so much cortisol emitted into your brain, it overflows the output field of the hippocampus, disrupting the flow of spatial and temporal context as you are dreaming. Without the hippocampus, the neocortical systems have to rely on disconnected fragments to fill in these memory gaps to continue your dreams. This is what causes those wacky dreams that are somewhat related to your past experiences but also bend the space-time continuum.

For example, you might remember the crippling anxiety you had before every one of your history in-class tests but then also be floating through space. The familiar feeling of anxiety comes from disconnected fragments of similarly-linked neocortical memories and the floating through space comes from the memory gaps hippocampal systems were supposed to fill in. Additionally, if you're already stressed going to bed, you already have high levels of cortisol pumped into your brain, causing you to have a worse nightmare about your classes. As high schoolers, our most traumatic experiences usually occur in school environments, so our nightmares will usually involve our worst classes. When your brain is overloaded with stress hormones and the only thing your neocortical system readily has available is that memory of your getting your first geometry test back, you're more likely to have a nightmare about geometry class, even if you're a senior focused on Art History. Cortisol occurs during REM phases, when you're more likely to remember your dreams. If you have great memories from your favorite classes, you'll probably dream about them during the NREM phase and not remember them the next morning.

Many veterans suffer from PTSD dreams, because their PTSD increases cortisol during REM phases, causing violent memory-fueled nightmares. You might not be able to change the way your sophomore chemistry class went, but you are able to control the way you dream about it. Going to sleep with a calm, positive mindset could decrease the amount of cortisol already pumped into your brain. You can always brood about that class when you're awake, but for the few hours you get to sleep every night, you deserve to take a break.