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Persuasive Paper - Should students listen to music while they study?

<https://www.telegraph.co.uk/science/2017/09/07/should-listen-music-work-according-scientific-findings/>

"Why you should listen to music while you work, according to scientific findings"

by Mike Wright

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Some prefer to labour in peace. Others find blaring their favourite tunes helps keep them productive. Hitherto it has been matter of personal preference. But now scientific research has uncovered that listening to music can actually be beneficial while you work. Although, it depends on what you're trying to achieve.

A study by Simone Ritter, at Radboud University in the Netherlands, and Sam Ferguson, at the University of Technology in Sydney, Australia, looked at how listening to various types of music affected different types of thinking compared to working in silence.

Their study found that happy music enhanced participants creative 'divergent thinking'. However they found it had no impact on 'convergent thinking', which is problem-solving.

In their study, Ritter and Ferguson split 155 volunteers into five groups, which were then given tasks to complete. Four of the groups did so while listening to classical music aimed at stimulating different moods, such as Holst's Mars and Vivaldi's Spring. The fifth group worked in silence.

They found that the groups working to music they considered positive generally came up with more original ideas.

Ritter and Ferguson said: "The current project aimed to shed light on the potential association of music listening for optimizing divergent and convergent creativity, and demonstrated that listening to 'happy music' (i.e., classical music that elicits positive mood and is high on arousal) is associated with an increase in divergent thinking, but not convergent thinking."

The upshot being, if you need to be creative with your work, then you should stick some uplifting music to help get the cognitive juices flowing. But if you're trying to solve an problem, you're better off opting for quiet solitude.

<http://www.businessinsider.com/10-minute-trick-to-boost-your-productivity-2016-1>

"A neuroscientist explains why you should stop listening to music while you work"

by Shana Lebowitz Jan. 25, 2016, 2:39 PM

Since I was gifted a new pair of headphones this past holiday season, I've developed a habit of listening to music while I work. I've been absolutely amazed by how much more productive and creative I am with Pandora's Mozart or "classical guitar" station playing quietly in the background. Curious as to what exactly was going on in my brain during these listening sessions, I reached out to Daniel Levitin, a cognitive neuroscientist and the author of "This is Your Brain on Music." "Not to rain on your musical parade," he told me, but those listening sessions are likely making me less productive. Cue the record scratch. "You're having so much more fun," said Levitin (who's also a musician), "that you feel more productive."

He cited a growing body of research suggesting that, in almost every case, your performance on intellectual tasks (think reading or writing) suffers considerably when you listen to music. Consider this 2010 study, which found that people performed worse on a memory task when they listened to music in the background, compared to when they worked in quiet. A better bet, according to Levitin? Listen to music for 10 to 15 minutes before you start working. He explained that listening to tunes you enjoy can put you in a better mood and relax you. Your brain releases the neurotransmitter dopamine, which gives you a "warm feeling of pleasure." You may also get a hit of the neurotransmitter serotonin, which elevates your mood and can make it easier to focus. Unfortunately, Levitin said, listening to music also takes up some of your attentional capacity, meaning that if you listened to it while working, you'd have fewer resources left to direct toward the task at hand.

The exception is when you're performing tasks that are repetitive or monotonous, such as when you're working on an assembly line or driving for long periods of time. In those cases, Levitin said, it's easy to get bored, so music can increase your arousal and help you pay more attention to your work. Levitin said he applies the scientific research on music and productivity in his own life. When he's studying or writing, he works in quiet and takes breaks for either music listening, exercise, or simply being in nature, all of which can be restorative. But when he's doing a relatively dull task, like his accounting, he often puts on music (he's also a fan of Pandora's classical guitar station).

Another reason why I might have mistakenly believed that music was helping my performance? Simply wearing headphones — especially when you work in a busy newsroom like I do — can help you focus.

<https://www.theguardian.com/education/2016/aug/20/does-music-really-help-you-concentrate>

"Does music really help you concentrate?: 'I won't be able to focus if you turn that off,' a gazillion teenagers have whined at their parents. Is it possible that they're right?"

by Dean Burnett Saturday, 20 Aug 2016

Many people listen to music while they're carrying out a task, whether they're studying for an exam, driving a vehicle or even reading a book. Many of these people argue that background music helps them focus. Why, though? When you think about it, that doesn't make much sense. Why would having two things to concentrate on make you more focused, not less? Some people even go so far as to say that not having music on is more distracting. So what's going on there?

It's not clear why the brain likes music so much in the first place, although it clearly does. Interestingly, there's a specific spectrum of musical properties that the brain prefers. Experiments by Maria Witek and colleagues reveal that there needs to be a medium level of syncopation in music to elicit a pleasure response and associated body movement in individuals. What this means in plain English is: music needs to be funky, but not too funky, for people to like it enough to make them want to dance. Your own experience will probably back this up. Simple, monotonous beats, like listening to a metronome, aren't really entertaining. They have low levels of syncopation and certainly don't make you want to dance. In contrast, chaotic and unpredictable music, like free jazz, has high levels of syncopation, can be extremely off-putting and rarely, if ever, entices people to dance.

The middle ground (funk music like James Brown is what the experimenters reference most) hits the sweet spot between predictable and chaotic, for which the brain has a strong preference. Most modern pop falls somewhere within this range, no doubt.

Paying Attention

Why would music help us concentrate, though? One argument is to do with attention. For all its amazing abilities, the brain hasn't really evolved to take in abstract information or spend prolonged periods thinking about one thing. We seem to have two attention systems: a conscious one that enables us to direct our focus towards things we know we want to concentrate on and an unconscious one that shifts attention towards anything our senses pick up that might be significant. The unconscious one is simpler, more fundamental, and linked to emotional processing rather than higher reasoning. It also operates faster. So when you hear a noise when you're alone at home, you're paying attention to it long before you're able to work out what it might have been. You can't help it.

The trouble is, while our conscious attention is focused on the task in hand, the unconscious attention system doesn't shut down; it's still very much online, scanning for anything important in your peripheral senses. And if what we're doing is unpleasant or dull – so you're already having to force your attention to stay fixed on it – the unconscious attention system is even more potent. This means that a distraction doesn't need to be as stimulating to divert your attention on to something else.

Have you ever worked in an open-plan office and been working on a very important task, only to be driven slowly mad by a co-worker constantly sniffing, or sipping their coffee, or clipping their nails? Something quite innocuous suddenly becomes much more infuriating when you're trying to work on something your brain doesn't necessarily enjoy.

Music is a very useful tool in such situations. It provides non-invasive noise and pleasurable feelings, to effectively neutralise the unconscious attention system's ability to distract us. It's much like giving small children a new toy to play with while you're trying to get some work done without them disturbing you.

Type of Music

However, it's not just a matter of providing any old background noise to keep distractions at bay. A lot of companies have tried using pink noise – a less invasive version of white noise – broadcasting it around the workplace to reduce distractions and boost productivity. But views on the effectiveness of this approach are mixed at best.

It seems clear that the type of noise, or music, is important. This may seem obvious: someone listening to classical music while they work wouldn't seem at all unusual, but if they were listening to thrash metal it would be thought very strange indeed.

While the nature and style of the music can cause specific responses in the brain (funky music compels you to dance, sad music makes you melancholy, motivational music makes you want to keep fit), some studies suggest that it really is down to personal preference. Music you like increases focus, while music you don't impedes it. Given the extreme variation in musical preferences from person to person, exposing your workforce or classroom to a single type of music would obviously end up with mixed results. Music also has a big impact on mood – truly bleak music could sap your enthusiasm for your task. Something else to look out for is music with catchy lyrics. Musical pieces without words might be better working companions, as human speech and vocalisation is something our brains pay particular attention to.

Video Game Soundtracks

Some people argue that one of the best music genres for concentration is the video game soundtrack. This makes sense, when you consider the purpose of the video game music: to help create an immersive environment and to facilitate but not distract from a task that requires constant attention and focus. Limitations in the technology used for early games consoles meant the music also tended to be fairly simplistic in its melodies – think Tetris or Mario. In a somewhat Darwinian way, the music in video games has been refined over decades to be pleasant, entertaining, but not distracting. The composers have (probably unintentionally) been manipulating the attention systems in the brains of players for years now. There are signs that, as technology progresses, this type of theme music is being abandoned, with games producers opting for anything from big orchestral pieces to hip-hop. The challenge will be to maintain the delicate balance of stimulation without distraction. To achieve this, games composers will need to stay focused. Which is ironic.

Dean Burnett's first book, [The Idiot Brain](#), all about the weird and confusing properties of the brain, is available now in the UK and the US.

<http://www.learningscientists.org/blog/2016/11/10-1>

"Listening to Music while Studying: A Good or a Bad Idea?"

by Carolina Kuepper-Tetzel

I rush into the library to drop off some books. When I turn around I see students sitting at tables going over their notes and reading their textbooks; studying. It's that time of the year again: Exam season is underway. I notice that many of them are wearing headphones and I start to wonder: What are they listening to? Their favourite songs, relaxing lounge tunes, or white noise that cancels out disturbing noise from the outside? Does it make a difference at all what they are listening to while studying?

Before reviewing research that has looked into this question, let me first bust a myth about music and human cognitive skills. You have probably heard about the Mozart Effect. If you ask people in the general public about this effect, they will probably say something along the lines: Oh yes, listening to music by Mozart makes you smarter. However, this statement is not only completely false, but is also a misinterpretation of the Mozart Effect. The Mozart Effect is a brief enhancement of spatial-temporal abilities in college students after listening to a Mozart piano sonata. The finding was reported by Rauscher, Shaw, and Ky (1) in an experiment where they had students listen to Mozart's piano sonata, to a relaxation music, or to nothing (silence condition) before performing a spatial reasoning task (a subtest from the Stanford-Binet intelligence scale). The researchers found that participants' performance on the spatial reasoning task improved after they had listened to the Mozart sonata compared to the other conditions. However, there are a couple of points that are important to know:

1. the effect is extremely short-lived with the positive enhancement in spatial reasoning only lasting for 10-15 minutes,
2. the improvement is restricted to a quite abstract mental rotation task that is only a small part of the equation when assessing intelligence, and
3. other studies were not able to replicate this finding (2).

Taken together, the Mozart Effect has no relevance for educational practice and, unfortunately, listening to Mozart music will not make you smarter.

Now that this is out of the way, let's turn to studies that have investigated the effects of background music on learning. One idea why listening to background music while studying or performing a task may be potentially beneficial has been put forward by Schellenberg and colleagues (3) in their arousal-emotion/mood-activation hypothesis. It assumes that music that puts you in a positive mood has a positive effect on your performance. Another idea is the changing state hypothesis, which states that rapidly changing music will distract learning and lead to poor performance (4).

What evidence is there for either of the explanations and can we find an answer to the question whether listening to music while learning is a good or bad thing? In one study, for example, participants studied vocabulary pairs either under a silence condition or music condition with classical music playing in the background (5). Participants underwent three learning sessions and were tested one week later. The results show that participants tend to perform better on the final test when they had listened to music while studying vocabulary. However, the author of that study acknowledges that not all participants seemed to have benefitted to the same extent from listening to background music during studying. Another study looked into this more closely and investigated the role of personality traits for the effects of background music on different cognitive tasks (6). The results of this study are quite mixed. For instance, whether performance was hindered or helped by background music depended on the type of task. For instance, verbal reasoning was better under the music condition compared to the silence condition, but abstract perceptual reasoning was hurt by simultaneously listening to music. After controlling for general IQ, background music showed a negative effect on introverted people for abstract reasoning, but no effect on extraverted people. For verbal reasoning, however, introverts and extraverts were not affected differently by listening to music while performing the task. One explanation for this finding is that the abstract reasoning task is more complex than

the verbal reasoning task. Thus, task complexity seems to play a moderating role when deciding whether to listen to music while studying. If the task at hand is quite complex and you are more on the introverted spectrum you may be better off studying without music.

Hallam, Price, and Katsarou (7) investigated the effects of background music on math learning and verbal memorisation in young children in primary school. For math learning, they had pupils solve arithmetic problems under music (mood-calming) or silence conditions. Although pupils performed equally well under both conditions in regard to accuracy, they solved the math problems quicker in the music condition. The verbal memorisation task required them to read sentences and remember a missing word in a sentence for later. Studying occurred under one of three conditions: silence, unpleasant/ aggressive music, or pleasant/calm music. Again, it was found that performance was best when pupils had studied with pleasant music playing in the background. Performance was worst in the unpleasant, aggressive music condition. Thus, it seems to be the case that music that puts you in a good mood and that is not interrupting because of rapid changes in tempi can be beneficial while studying. The studies presented so far did not test these two explanations against each other, but a study by Jäncke and Sandmann (8) did. Surprisingly, they did not find any substantial or consistent influence of background music on verbal learning. Thus, whether participants studied with or without pleasant/unpleasant/slow changing /fast changing instrumental music in the background did not matter.

So, should you listen to music while you are studying? As it is often the case when looking at evidence from research, the answer seems to boil down to: It depends! Certainly, features of the task seem to play a crucial role and studying complex material that requires you to engage all your focus on what you are trying to understand may be hindered by any kind of background music. Tasks that require you to keep track of several pieces of information at one time while processing them, too (i.e., tasks heavy on working memory demands), may be particularly affected by any kind of background music or noise (9) and are best done in complete silence. Your personality seems also to play a role on whether you will benefit at all from listening to your favourite tunes while studying. And only to complicate things even further, we have seen that an interaction of both factors, task complexity and personality, may be in place. Nevertheless, positive effects of background music have been found and it may certainly be worth trying it out.

I, personally, don't do anything without listening to music. So, while writing this blog post, I have been listening to soothing background music. However, in the past, I have caught myself turning the music down when trying to grasp a complex bit of information when reading a scientific article. So, there you go: It depends!

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