

Are noise-cancelling headphones impairing our hearing skills? Some audiologists are beginning to worry

Level 3: Advanced

1 Warmer

a. Discuss the following questions in pairs.

- Do you use noise-cancelling headphones? In what situations are they most useful and why?
- Do you think reducing background noise could have any negative effects on our hearing or brain function? Why or why not?
- In what ways might long-term use of noise-cancelling technology impact our ability to focus in noisy environments?

2 Key words

a. Find the words from the wordpool in the article. Then use the words to complete the definitions using the correct form.

an uptick	come under scrutiny	hunch	robust
auditory	culprit	impair	segregate
autism	din	plasticity	suppressing
be triggered by	home in on	prized for	warrants
chronic	hubbub	prolonged	

1. If something is _____, it is very productive and produces good results.
2. A(n) _____ is a small increase in the number or level of something.
3. _____ means that something is related to hearing or the sense of sound.
4. If something is _____ something else, it is caused or set off by that thing.
5. A(n) _____ condition lasts for a long time or keeps coming back.
6. When something _____, it is examined or criticised very carefully.
7. A(n) _____ is the person or thing responsible for a problem or crime.
8. A(n) _____ is a loud, continuous and often unpleasant noise.

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9. _____ means a busy, noisy situation with lots of people talking or moving.
10. A(n) _____ is a strong feeling or guess about something that isn't based on factual evidence.
11. If something _____ your ability, it makes it weaker or less effective.
12. _____ refers to the brain's ability to change and adapt.
13. If something is _____ a quality, it is valued and appreciated because of it.
14. A(n) _____ activity is one that continues for a long time, often longer than expected.
15. When something _____ attention, it deserves or justifies it.
16. When you _____ something, you separate it from other things.
17. To _____ something means to focus on or move towards it with great accuracy.
18. _____ something means stopping it from being expressed or happening.
19. _____ is a neurological condition where one may find social interactions difficult, while others may excel in specific areas such as memory, pattern recognition or logical thinking.

b. Complete the sentences with the correct form of the words from the previous activity.

1. Scientists have a(n) _____ that the new medication will be effective, even though they are yet to have any concrete proof.
2. The loud _____ of traffic made it hard to concentrate on my work.
3. The defendant's lawyers argued that the evidence was weak and did not _____ a retrial.
4. After years of _____ stress, Graham developed severe headaches.

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5. The new policy has _____ after people started questioning its fairness.
6. A slight _____ in the number of flu cases led to renewed safety measures at the hospital.
7. Jack's ability to focus was _____ after spending years listening to loud rock music.
8. The brain's _____ allows people to recover certain skills after an injury.
9. The sudden increase in pollution was _____ an industrial accident.
10. These headphones are highly _____ their ability to block out noise.
11. Our teacher had to _____ a group of disruptive students from the rest of the class.
12. Scientists have found that newborns respond to _____ stimuli, such as their mother's voice.
13. The police identified the main _____ behind the cyberattack.
14. Orders were given to _____ any protests from the opposition.
15. A good journalist usually manages to _____ the key issue in the debate.
16. The restaurant was filled with the _____ of people talking and laughing.
17. Maria's speech was difficult to follow due to a(n) _____ period of illness lasting two years.
18. Some people with _____ have excellent attention to detail and strong memory skills.
19. Lawyers demanded a(n) _____ investigation into the company's finances.

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Some specialists suspect that constantly filtering out background noise may have unintended consequences

Ian Sample

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- 1 They are prized for making the commute more bearable and blocking out the din of daily life. But noise-cancelling headphones have come under scrutiny after audiologists raised concerns that overuse might impair people's hearing skills.
- 2 While the technology has clear benefits, not least in helping people listen to music at lower volume, some specialists suspect that constantly filtering out background noise may have unintended consequences.
- 3 Renee Almeida, an adult audiology clinical lead at Imperial College healthcare NHS trust, has seen an uptick in adults coming to her clinic with hearing issues only for tests to suggest their hearing is fine.
- 4 The problem is with their brain, not their ears. They might fail to locate where a sound is coming from, or struggle to follow a conversation on the train, in a bar or at a restaurant.
- 5 The condition, known as auditory processing disorder (APD), is often diagnosed in children, so the rise in adults with similar issues struck Almeida as odd. Her hunch is that widespread use of noise-cancelling headphones could be the culprit.
- 6 "The brain is used to dealing with thousands of different sounds at the same time and it's always been able to figure out what is and isn't worth listening to. With noise cancelling, you're giving your brain only one source of sound, be it a podcast or music. One source. There's nothing else for your brain to worry about."
- 7 Excessive use of noise-cancelling headphones could impair the developmental process by which children learn to attend to sounds, Almeida says. For adults, it could make their brains lazy, just as muscles weaken without exercise. In both cases, she says, people could struggle to extract speech from the hubbub around them.
- 8 There is no scientific evidence that noise-cancelling headphones cause APD. Nor is there any robust data showing a rise in the condition. But Almeida believes the question warrants attention. "Studies definitely need to be done," she says. "The research should focus on the effects of extended use, especially in young people."
- 9 APD affects about three to five per cent of school-age children. It has been linked to low birth weight, but also chronic middle ear infections. In older adults, the condition can be triggered by stroke or head trauma. In many cases, the cause is never clear.
- 10 According to Harvey Dillon, a professor of auditory science at the University of Manchester, there is no doubt that listening experience affects our ability to segregate "wanted speech" from background noise. He says children improve at using spatial cues to home in on sound sources from the age of five to 14 years old.
- 11 But disrupting what is heard can be more problematic for children than adults. If a child has repeated ear infections before the age of five, they can find it hard, later on, to focus on sounds from one direction while suppressing those from another. Surprisingly, Dillon says, many don't catch up once their infections are behind them. Instead, they need to learn the skill through intensive sound training.
- 12 Adults seem to be different. If a person wears a single earplug for a week, they will gradually relearn how to locate where sounds are coming from. When the earplug is removed, their ability drops again, but quickly recovers to its previous level.
- 13 For Dillon, the idea that noise-cancelling headphones might be driving APD is a hypothesis yet to be tested. "There is no research that I am aware of investigating a link between the use of noise-cancelling headphones and reduced auditory processing ability," he says. "It may be that listening to loud music is the cause of the auditory processing problem, not the noise-cancelling feature," he says. "If so, noise cancelling could be a good feature, in that it allows one to listen to music, without interference from background noise, at a lower level."

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- 14 Prof Dani Tomlin, the head of audiology and speech pathology at the University of Melbourne, says people who use noise-cancelling headphones for prolonged periods may find listening harder when they take them off. But she says, “the benefits should not be overlooked”, for managing sensory inputs in people with autism and helping individuals to listen to podcasts and movies on planes and trains. “Instead of suggesting abandoning noise-cancelling headphones, we need more comprehensive research studies,” she adds.
- 15 For now, Almeida recommends bone conduction headphones and hearing training. She urges patients to listen to radio debates and to take down the lyrics of rap songs when they are playing. “There is immense plasticity in the brain,” she says. “Make an effort to listen to what’s being said.”

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3 Comprehension check

a. Are these sentences True (T) or False (F) according to the article?

1. Noise-cancelling headphones always improve hearing and have no negative effects. _____
2. Some audiologists are concerned that noise-cancelling headphones may impact auditory processing skills. _____
3. Auditory processing disorder (APD) is only diagnosed in children. _____
4. There is strong scientific evidence proving that noise-cancelling headphones cause APD. _____
5. People with APD may struggle to follow conversations in noisy environments. _____
6. The brain naturally learns to filter out background noise from a young age. _____
7. Listening to loud music can damage auditory neurons without affecting hearing test results. _____
8. Prolonged use of noise-cancelling headphones has been proven to permanently damage hearing. _____
9. Neurodiverse individuals may benefit from using noise-cancelling headphones to manage sensory input. _____
10. Experts recommend completely avoiding noise-cancelling headphones to prevent auditory issues. _____

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4 Key language

a. Choose the correct option (a, b or c).

1. Which sentence expresses a possibility?
 - a. Noise-cancelling headphones must be the cause of APD.
 - b. Noise-cancelling headphones may contribute to APD.
 - c. Noise-cancelling headphones should not be used by anyone.
2. Which sentence expresses prohibition?
 - a. Researchers must not ignore other causes of APD.
 - b. Researchers may not ignore other causes of APD.
 - c. Researchers should not ignore other causes of APD.
3. Which sentence expresses a lack of necessity?
 - a. People must not use noise-cancelling headphones too often.
 - b. People don't need to stop using noise-cancelling headphones completely.
 - c. People should not use noise-cancelling headphones at all.
4. Which sentence gives strong advice?
 - a. People should avoid using noise-cancelling headphones too much.
 - b. People may avoid using noise-cancelling headphones too much.
 - c. People might avoid using noise-cancelling headphones too much.
5. Which sentence expresses speculation about the past?
 - a. Noise-cancelling headphones should contribute to APD.
 - b. Noise-cancelling headphones must contribute to APD.
 - c. Noise-cancelling headphones could have contributed to APD.

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6. Which sentence suggests strong certainty?
- Experts should not assume noise-cancelling headphones are harmful.
 - Experts might not assume noise-cancelling headphones are harmful.
 - Experts must assume noise-cancelling headphones are harmful.

b. Write three sentences about yourself using the modal verbs from the previous activity.

5 Discussion

a. Discuss these questions.

- Do you think noise-cancelling headphones should come with a warning about possible effects on processing sounds? Why or why not?
- Have you ever struggled to hear someone speaking in a noisy place? How did you manage the situation?
- How has technology changed the way we experience sound in daily life?

6 In your own words

a. In pairs or small groups, find a short spoken text such as a news report, a conversation or a set of instructions. Then find a pre-recorded sound clip of crowd noise, music or multiple voices speaking at once.

Student A: listens to the spoken text only.

Student B: listens to the same text with the background sound clip playing at the same time.

Student C: (optional) listens to the spoken text using noise-cancelling headphones.

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b. Then discuss the following questions as a class:

- Who found it easiest to understand the text?
- How did the background noise affect comprehension?
- How might this reflect real-life challenges for individuals with autism or APD?
- What can we do to be more inclusive of people with APD or autism?