Popular science summary of the PhD thesis

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Title of the PhD thesis	Audiovisual Listening Effort in Normal Hearing and Hearing Impaired Listeners
PhD school/Department	Department of Applied Mathematics and Computer Science

Science summary

In everyday life, we are surrounded by sounds, sights, and other sensory information that help us make sense of our surroundings. One common example is having a face-to-face conversation, which isn't just about hearing words, it also involves seeing the other person's facial expressions and mouth movements.
However, real-life conversations often happen in noisy environments, like cafes or busy streets. This background noise can make it harder to hear and understand what someone is saying. When listening becomes harder, our brains must work more, which means we use more mental energy or "effort". Traditional hearing tests often miss how tiring this can be for people, especially in noisy situations.
Research has shown that how much effort we put into listening depends on two things: how hard the task is, and how motivated we are to understand. Interestingly, there's a point where if the task becomes too difficult, people tend to stop trying, using less effort instead of more.
Another important point is that what we see can help us hear better. For example, watching someone's mouth while they speak can improve how well we understand them. Studies have found that seeing a speaker's face can boost speech recognition, speed up how quickly we process speech, and improve learning and comprehension. But it's still unclear how much this visual help reduces the mental effort needed to understand speech, especially at different levels of difficulty. This is particularly important for people with hearing loss, who often rely more on visual information.
Despite this, there's a lack of good audiovisual materials for research. Many past studies used artificial sounds or setups that don't reflect real-world conversations. As a result, researchers often must create their own materials, which can vary in quality and make results harder to compare. Thus, we set out to also create and validate a new audiovisual stimulus corpus (AV-DAST).
Overall, our research shows that visual information, like mouth movements, can help reduce the mental effort needed to understand speech in real-world conversations. We also created a useful tool (AV-DAST) for future research. Our findings expand on existing theories about listening effort and show how they apply when multiple senses—like hearing and vision—work together. This work also highlights the importance of developing better ways to measure listening effort, especially for people with hearing loss.

Please submit the summary to the department PhD coordinator together with your thesis