

## Ageing increases the impact of audiovisual synchrony on speech comprehension in adverse listening situations

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### Abstract

Age-related hearing loss profoundly impairs speech comprehension in noisy environments [1, 2, 3, 4, 5]. Combining psychophysics and fMRI we investigated the role of audiovisual asynchrony (-250, 0, +250 ms) on intelligibility of audiovisual (AV) speech in younger and older adults. AV speech was presented with and without babble noise. Older and younger adults did not differ in their ability to discriminate between synchronous and asynchronous speech irrespective of the presences of noise. Nevertheless, older participants' speech comprehension was significantly more impaired for asynchronous relative to synchronous speech, when the speech was presented with babble noise. At the neural level, we observed that this decrement in speech comprehension for asynchronous AV speech was mediated by activations in a widespread neural system including the superior temporal sulci. These regions showed an activation increase for synchronous relative to asynchronous speech in noise in older adults, but a decrease in younger adults (i.e. significant cross-over group x (a)synchrony interaction). Collectively, our results demonstrate that audiovisual synchrony can impact the neural processes underlying speech comprehension differently in older and younger adults, even though both groups are equally good at discriminating between synchronous and asynchronous speech.

### References

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