

HIGHLIGHTS

MOTOR CONTROL

Mouthing off

It is probable that most people can recall moments of embarrassment when something that they said “didn’t quite come out right”. Generally, though, our brains are very good at ensuring that what comes out of our mouths corresponds to what we were intending to say. Until recently, this process was believed to rely largely on auditory feedback, but as David Ostry and colleagues report in *Nature*, somatosensory input might have an equally important role in speech production.

In their study, Tremblay *et al.* instructed their subjects to practice saying an unfamiliar ‘word’ (“siat” — pronounced “see-at”). Then, a mechanical load was placed on the jaw using a robotic arm. This perturbed the movement of the jaw, but had no discernable effect on the acoustic properties of the subjects’ speech. The authors found that over time, the jaw movements adapted to the perturbation and reverted to the path that was associated with the utterance before the load was applied.

To confirm that auditory feedback was not contributing in any way to this adaptation, Tremblay *et al.* asked a different group of subjects to mouth “siat” without vocalization. They found that adaptation still occurred, even though there was no acoustic goal. In addition, the authors trained a third group of people to make an unfamiliar non-speech jaw movement. Intriguingly, no adaptation was observed in this case, indicating that the jaw could only com-

pensate for the load if its movements were relevant to speech.

Tremblay *et al.* have shown that the generation of speech relies not only on auditory information, but also the brain’s ability to track the position of the jaw. This might explain why people who become deaf in adulthood often retain the ability to speak long after they have been deprived of auditory feedback. This research could have important implications for speech therapy; for example, it would be interesting to find out whether therapeutic strategies that

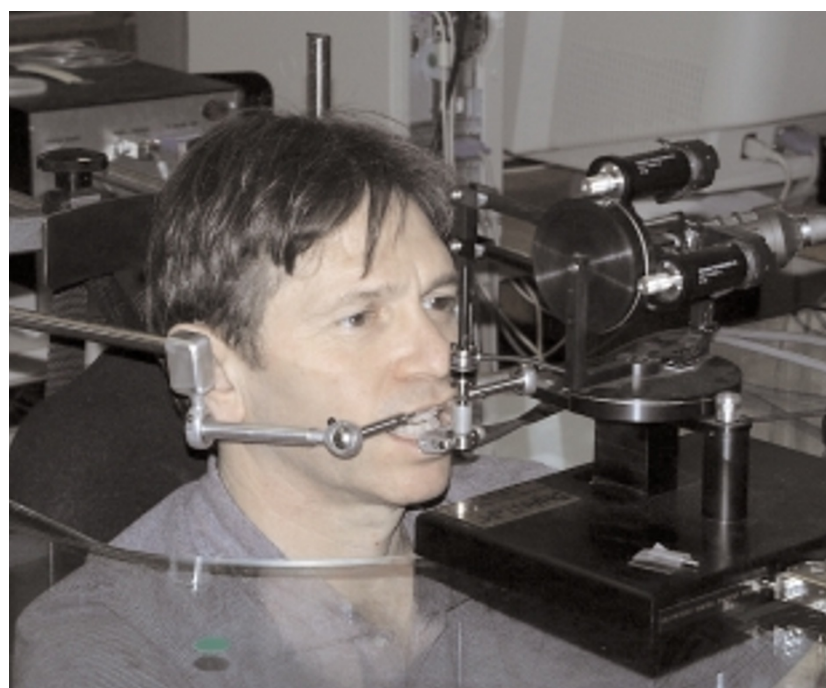
focus on somatosensory goals rather than acoustic goals can facilitate speech in people who have been deaf from birth.

Heather Wood

References and links

ORIGINAL RESEARCH PAPER Tremblay, S. *et al.* Somatosensory basis of speech production. *Nature* **423**, 866–869 (2003)

FURTHER READING Brainard, M. S. & Doupe, A. J. Auditory feedback in learning and maintenance of vocal behaviour. *Nature Rev. Neurosci.* **1**, 31–40 (2003)



Perturbation of jaw movements using a robotic arm. Image courtesy of David Ostry, McGill University, Montreal, Canada.