**Category**
Hearing and Language

**Project title**
Efficient spoken word identification in hearing-impaired individuals

**Associated Researcher(s)**
Bob Carlyon, Matt Davis

**Project details**
Listeners with intact hearing achieve a near-optimal combination of speed and accuracy in identifying spoken words. Words can often be recognised before their offset, time-locked to the earliest sound (/z/) that distinguishes a target word (lizard) from similar sounding neighbours (listen). However, for degraded speech or hearing-impaired individuals, word recognition becomes less efficient even if recognition accuracy remains high. For example, speech-driven eye-movements show delayed identification of words like lizard due to consideration of rhyming words (wizard) [1]. The proposed project will devise behavioural methods to measure the speed and efficiency of spoken word recognition in individuals with intact or impaired hearing, including cochlear implant users. EEG and MEG measures of brain activity during spoken word recognition can be used to constrain neural and computational theories of speech identification [2]. Assessing the efficiency of spoken word recognition allows us to quantify processes that are critical for everyday comprehension and that minimise listening effort. This provides an initial step towards quantifying and improving real-world listening outcomes for hearing-impaired individuals.

**References and URL(s)**

**Reference**
<table>
<thead>
<tr>
<th>Reference</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td><a href="https://doi.org/10.1016/j.cognition.2017.08.013">https://doi.org/10.1016/j.cognition.2017.08.013</a></td>
</tr>
<tr>
<td>2</td>
<td><a href="https://doi.org/10.1523/JNEUROSCI.1685-20.2021">https://doi.org/10.1523/JNEUROSCI.1685-20.2021</a></td>
</tr>
</tbody>
</table>