Western BrainsCAN
Transforming brain research.

ResearchSummary
KNOWLEDGE MOBILIZATION & IMPACT

Can training improve speech intelligibility and voice recognition?

Background

We encounter familiar people every day - friends, partners and family members. We also encounter people we know less well, work colleagues or television and radio presenters, and people entirely new to us. As we get to know someone new, we develop the ability to recognize their identity from their voice. We are also better able to understand words spoken by familiar people than people we have never met.

When we tune into a new radio show or subscribe to a new podcast, how quickly do we become familiar with the presenter's voice?

The Research

Our understanding of how long it takes to become familiar with new voices is relatively limited. We investigated the extent to which recognition and intelligibility of a voice improve after different lengths of voice training. (When we say "voice training" and "trained voice", we are referring to training the listener, not the speakers.)

Our first aim was to assess whether brief voice training could produce speech-intelligibility benefits and, if so, how speech intelligibility relates to the length of time that participants have been trained on that voice.

Our second aim was to compare explicit recognition of a voice with any speech-intelligibility benefit for the same voice. In some of our past work (see Related on right), we showed that a familiar voice can be more intelligible even if it is not explicitly recognizable. Since that work showed we can partially dissociate or separate those two aspects, intelligibility and recognition, it's reasonable to think that intelligibility and recognition may develop at different rates.

Our third aim was to compare two different training conditions: training in quiet surroundings and training in the presence of babble noise.

Our study contained four parts: familiarization, training, an explicit-recognition test and a speech-intelligibility test. During familiarization, participants heard 10 sentences spoken by each of three talkers. During training, one of the voices was heard speaking 78 sentences, another 156 sentences and the third 468 sentences. In the explicit-recognition and intelligibility tests, they heard the same three voices and two other voices they had not previously heard.

Key Points

We found that people learn voices very rapidly. We are able to recognize a new voice (and distinguish it from other voices) accurately after as little as 10 minutes of training. While recognition of a voice seems to plateau quite quickly (our recognition doesn't improve with more training), intelligibility does keep improving as training continues up to one hour. We think the benefits of voice familiarity (such as improved intelligibility in everyday settings, helping people with hearing loss or jobs in noisy environments) can be achieved through deliberate training.

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The Findings

We found that people learn voices very rapidly. We are able to recognize a new voice (and distinguish it from other voices) accurately after as little as 10 minutes of training. In addition, the same exposure to a voice enables us to better understand words spoken even when background noise is present.

Recognition of the three voices was significantly above chance but it didn't improve with longer training. While recognition of a voice seems to plateau quite quickly, intelligibility does keep improving as training continues up to one hour. Intelligibility of the voice trained for an hour was comparable to that of a naturally familiar friend or spouse who you have known for a long time.

This provides new evidence for the dissociation of recognition and intelligibility, because we showed that they improve at different rates as voices become familiar through training.

Next Steps

This work suggests the benefit of a familiar voice isn't limited to voices we encounter naturally and can be trained artificially in the lab - there could be potential in such training for improving intelligibility in everyday settings, for older people, people with hearing loss and people whose occupations require accurate speech perception in noisy surroundings, such as aircraft pilots.

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It is also available online at: *http://brainscan.uwo.ca/research/research_summaries/INJO0521-R.html*