HAL
open science

Perceptual learning of speech produced by a speaker with Down Syndrome

Alexandre Hennequin, Amélie Rochet-Capellan, Jean-Luc Schwartz, Marion Dohen

To cite this version:

Alexandre Hennequin, Amélie Rochet-Capellan, Jean-Luc Schwartz, Marion Dohen. Perceptual learning of speech produced by a speaker with Down Syndrome. SMC 2017 - 7th International Conference on Speech Motor Control (SMC 2017), Jul 2017, Groningen, Netherlands. hal-01614528

HAL Id: hal-01614528

https://hal.science/hal-01614528v1

Submitted on 11 Oct 2017

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Perceptual learning of speech produced by a speaker with Down Syndrome

Alexandre Hennequin, Amélie Rochet-Capellan , Jean-Luc Schwartz & Marion Dohen
Univ. Grenoble Alpes, GIPSA-Lab, F-38000 Grenoble, France – alexandre.hennequin@gipsa-lab.fr

Context

Down Syndrome
- Genetic disease
- Motor issues
- Anatomic abnormalities

} **Speech difficulties** → **Low intelligibility**

Kent & Vorperian (2013) ; Bunton et al. (2007)

Perception ⟷ Production

Dysarthric / DS speech ?

Borrie et al. (2015)

How could intelligibility be improved?

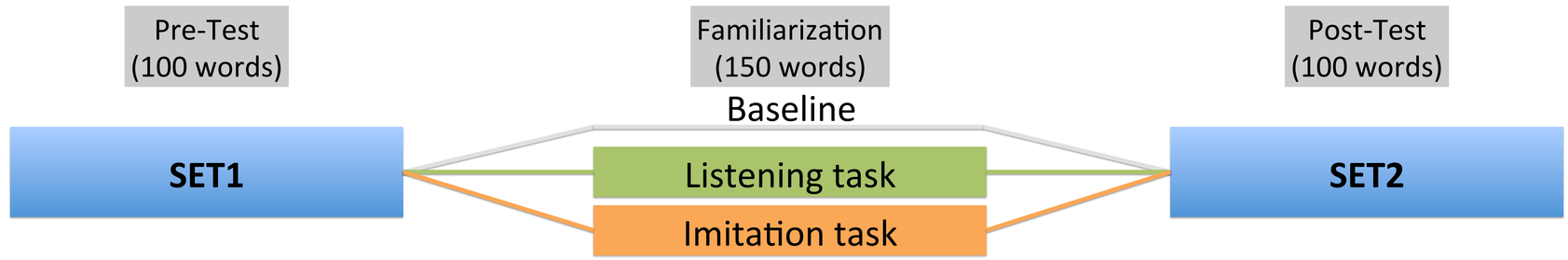
Perceptual Learning (PL)
- Quick
- Natural
- Already proved for accented or **dysarthric** speech

Familiarization task induces **PL efficiency**

Listening task < Imitation task

Adank et al. (2010) ; Borrie et al. (2012)

Experimental design



Speaker

1 young adult with Down Syndrome selected from a previous intelligiblity test (<70%)

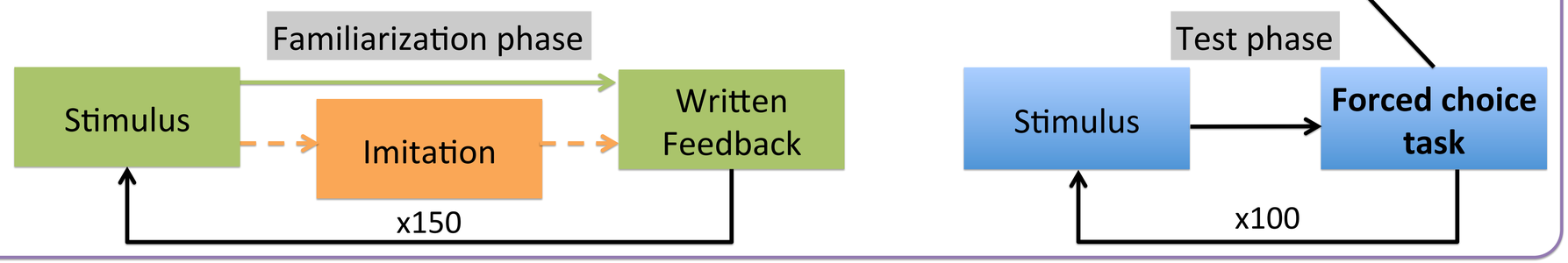
Stimuli

Total of 350 words selected from a French word database (New et al., 2001 – Lexique v.3.81)

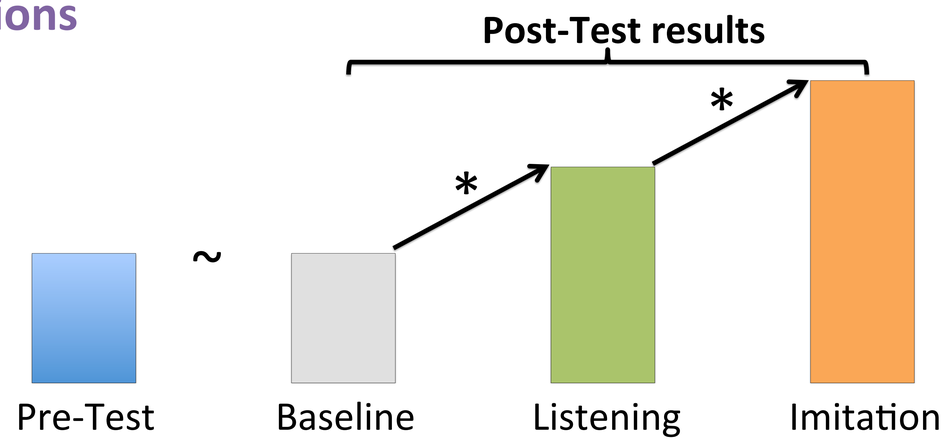
Familiarization set
- ✓ Balance of phonemes occurence

Tests SET1/SET2
- ✓ 20 phonological contrasts
- ✓ At least **3 minimal pairs**

Trials



Predictions



No improvement in Baseline

Improvement for the Listening task
- ✓ The participant should learn from the feedback how the speaker produces speech sounds relevant for French

Stronger improvement for the Imitation task
- ? **Attention** bias: double repetition (speaker and own)
- ? **Motor** involvement

Adank et al. (2010) ; Borrie et al. (2015)

This research has received funding from the European Research Council under the European Community's Seventh Framework Programme (FP7/2007-2013 Grant Agreement no.339152- "Speech Unit(e)s").