Feedback methods to improve phonetic and phonological skills in foreign language acquisition



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Feedback (FB)

Introduction

- Difficulty of making learners aware of pronunciation problems
- Strong accent can interfere with intelligibility
- Pronunciation has been mainly left out in L2 teaching
- >> Computer Assisted Pronunciation Training (CAPT)

Learner: <les amis> "[leami]"

Explicit correction "No, it's [lezami]." "[lezami]." Recast

Clarification request Metalinguistic fb

"Did you say [leami] or [lezami]?" "You have to pronounce it with a [z]

because the word following <les> starts with a vowel."

"No, it's...?" **Elicitation** "[leami]?" Repetition

Fig. 1 Hypothetical example of six types of corrective FB found in a class room study (Lyster and Ranta, 1997)

Visual		Aural	
Segmental marks using a color scale	5	Resynthesis of voice	3
Oscillogram	5	Reference video	2
Individual written information about correct articulation	4	Different speech rates	1
(Animated) vocal tract	4	Listening to own voice and reference speaker	1
Overall articulation score	3		
Pitch curve	3		
Explicit correctness information	3		
Spectrogram	2		
Info about pitch movement	2		
Formant graph	2		
Reference video	2		
Feedback on duration	1		
Overall articulation score Pitch curve Explicit correctness information Spectrogram Info about pitch movement Formant graph Reference video	3 3 2 2 2	Listening to own voice and reference speaker	1

Tab. 1 Visual and aural FB used in 11 CAPT systems including the amount of systems offering these particular features

French native speaker	German native speaker	
Realisation of /h/ and /?/	Liaison and enchaînement consonantique	
Oral vowel + nasal consonant	Nasal vowels	
Consonant cluster, affricates		
Vowel quantity		
Realisation of [ç x]		
Location of word stress		
Aspiration of /p t k/ and realisation of voiced sonorants in final position		
Postvocalic /r/ variations		
Reductions, elision, assimilations		
Realisation and location of pitch accents		
Location of contrastive accents		
Mistakes induced by orthography		

Tab. 2 Typical mistakes that might appear in non-native utterances and will require FB

- Facilitates self-regulatory processes in order to accomplish a task
 - Lyster and Ranta (1997) found six types of corrective FB (Fig. 1)
 - Needs additional information/instructions on how to improve the mistake
 - Lack of FB characterizes the negative side of current CAPT systems (Engwall et al., 2004)

Analysis and evaluation of feedback methods in CAPT

- 11 CAPT systems have been alaysed (Tab. 1)
- Graphical displays (e.g. wave forms) are difficult to interpret without phonetic knowledge
- None of Lyster & Ranta's (1997) FB types have been used
- Not a single system gives immediate information on how to correct the mistake

Proposed feedback methods

FB will be provides for typical mistakes in non-native utterances (Tab. 2)

- Explicit instruction on how to improve a mistake (Fig. 2 and 3)
- Descriptions for non-phoneticians
- Interactive graphical displays, e.g. vowel quality, pitch variation ("what you see is what you do")
- Similar acoustic parameters of golden speaker
- Resynthesis of voice
- Self-manipulaton of prosodical features
- . . .

Exercise: Liaison

You will see a single sentence on the screen, e.g. "Les enfants sont arrivés.".

Read and record the displayed sentence.

You will receive automated feedback on your pronunciation

Fig. 2 Possible exercise instructions

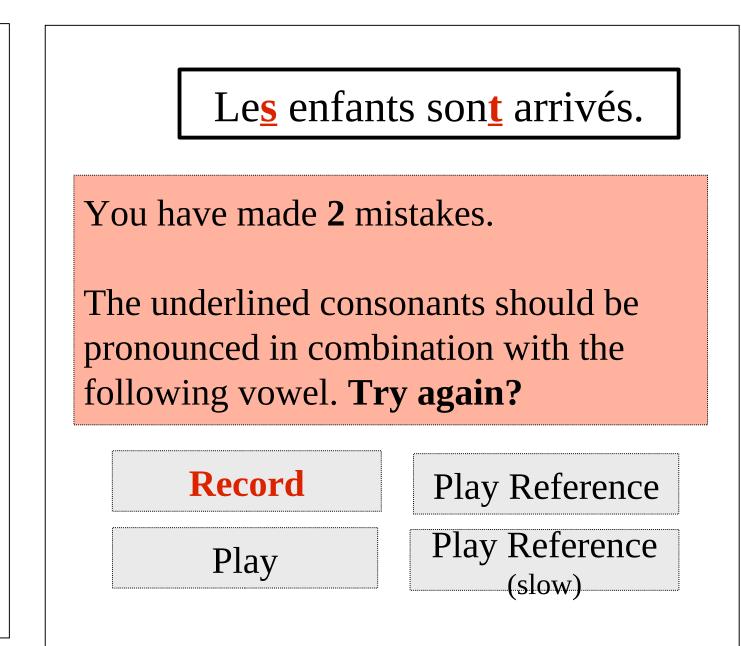


Fig. 3 Blueprint for a possible graphical representation of FB

Influence of individual learner strategy

- More than one learner strategy: only aural, only visual, combination of visual and aural (Eskenazi and Hansma, 1998)
- Test for learner strategies (games, questionnaires)

Future work 6

- Offline experiments to test proposed FB (individually)
- Perception experiments
- Consider different learner strategies

References