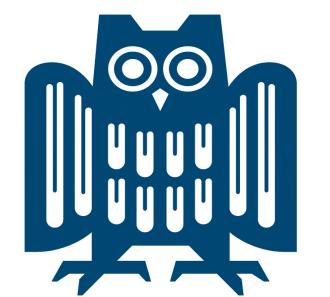


# Feedback methods to improve phonetic and phonological skills in foreign language acquisition



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## 1 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> “[leamɪ]”

**Explicit correction** “No, it's [lezami].”

**Recast** “[lezami].”

**Clarification request** “Did you say [leamɪ] or [lezami]?”

**Metalinguistic fb** “You have to pronounce it with a [z] because the word following <les> starts with a vowel.”

**Elicitation** “No, it's...?”

**Repetition** “[leamɪ]?”

**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	Listening to own voice and reference speaker
Oscillogram	5	Resynthesis of voice
Individual written information about correct articulation	4	Reference video
(Animated) vocal tract	4	Different speech rates
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	

**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 [?]	<i>Liaison and enchaînement consonantique</i>
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

## 5 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)

## 2 Feedback (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 aspect of current CAPT systems (Engwall et al., 2004)

## 3 Analysis and evaluation of feedback methods in CAPT

- 11 CAPT systems have been analyzed (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**

## 4 Proposed feedback methods

FB will be provided 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-manipulation 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

Les enfants sont arrivés.

You have made 2 mistakes.

The underlined consonants should be pronounced in combination with the following vowel. Try again?

Record

Play Reference

Play

Play Reference (slow)

**Fig. 2** Possible exercise instructions

## 6 Future work

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

## References

- Engwall, O., Wik, P., Beskow, J. & Granström, B. (2004). Design strategies for a virtual language tutor. *Proc. ICSLP 2004*, pages 1693-1696.  
Eskenazi, M. & Hansma, S. (1998). The Fluency pronunciation Trainer. *Proc. SiLL Workshop on Speech Technology in Language Learning*, pages 62-76.  
Lyster, R. & Ranta, L. (1997). Corrective feedback and learner uptake: negotiation of form in communicative classrooms. *Studies in Second Language Acquisition*, 20, pages 37-66.