

The development of comprehensible speech in L2 learners

Effects of explicit pronunciation instruction on segmentals and suprasegmentals

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Non-native pronunciation

- Affects all domains of L2 phonology
 - Segmentals (e.g., Caramazza et al., 1973; Munro, 1993; Hillenbrand & Flege, 1986; Munro & Derwing, 2008)
 - Suprasegmentals (e.g., Field, 2005; Munro, 1995; Tajima, Port, & Dalby, 1997; Trofimovich & Baker, 2006)
- Contributes to perception of foreign accent, to lower intelligibility and lower comprehensibility (Kang, Rubin, & Pickering, 2010; Munro, 1995)
- Debate: are suprasegmentals more important than segmentals to reduce foreign accent and improve comprehensibility? (Anderson-Hsieh et al., 1992; Derwing & Munro, 1997)



Acquisition of L2 phonology

- Naturalistic acquisition is modulated by
 - L1 Transfer (Munro, 1993; Trofimovich & Baker, 2006)
 - Amount of experience / length of residence (Bohn & Flege, 1992; Flege, Bohn & Jang, 1997; Munro & Derwing, 2008; Derwing, Munro & Thompson, 2007)
 - Amount of L2 use (Flege, Frieda and Nozawa, 1997, Guion, Flege, Liu, & Yeni-Komshian, 2000)
 - Age of learning (Guion, 2005; Lee, Guion & Harada, 2006)
- Improvement has also been observed in short-term laboratory training studies



Laboratory Training Studies

- Perception and production of segmentals: English /r/ and /l/ by L1-Japanese speakers (high variability training) (Bradlow, Akahane-Yamada, Pisoni, & Tohkura, 1997)
- Perception and production of suprasegmentals: Mandarin Chinese tones by L1-English speakers (Wang, Spence, Jongman, & Sereno, 1999; Wang, Jongman, & Sereno, 2003)



Laboratory Training Studies

- Interpretation of sentence meaning:
Improved in L2 learners of English by directing their attention to and raising their awareness of prosodic features of the L2 during training (Pennington and Ellis, 2000; Noticing Hypothesis: Schmidt 1990, 2001)
- Possible role of explicit instruction in pronunciation teaching



L2 Pronunciation Teaching

- Some studies suggest that explicit instruction yields larger phonetic improvement over non-explicit instruction (e.g., Lord, 2005)
- At the same time, there is a trend towards a communicative methodology (e.g. Celce-Murcia, Brinton, & Goodwin, 1996; Hinkel, 2006)
- Communicative framework is often perceived as conflicting with explicit pronunciation instruction
 - Pronunciation instruction often “disconnected” from the rest of language instruction (Derwing & Foote, 2011; Darcy, Ewert & Lidster, in press)



L2 Pronunciation Teaching

- Extensive research on the acquisition of L2 phonological features
- But its influence on second and foreign language **instruction** seems to be minimal (Derwing & Munro, 2005; Levis, 1999)
- Only few studies have examined L2 classroom contexts to test **how to apply** some of the findings of laboratory studies in L2 phonology to pronunciation instruction (e.g. Derwing, Munro, & Wiebe, 1998)



Challenges in L2 Pronunciation Teaching

- **Challenge 1:** How to integrate explicit pronunciation instruction in ESL communication/speaking classes ?
- **Challenge 2 :** Which pronunciation features yield the most benefit for comprehensible speech?
- **Challenge 3 :** Can improvement be seen in a short-period of time?



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The Current Study



Research Questions

- Does short-term **explicit** pronunciation instruction yield larger comprehensibility increases than **non-explicit** instruction?
- Does instruction in **suprasegmental** features yield larger comprehensibility increases than instruction in **segmental** features?



“Explicit” vs. “non-explicit”

- Targeting both instruction and feedback :
 - + / - Attention on error (and not meaning)
 - + / - Statement of difficulty and error
 - + / - Delineation of the target and error
 - + / - Means of correction



Method

- 3 groups given pronunciation instruction for 3 weeks
 - 30 learners of varied L1 backgrounds (Arabic, Turkish, Korean, and Japanese, Portuguese, French, Russian)
 - Speaking classes in a large ESL program (Intensive English Program)
 - Duration of treatment: 75 minutes per week, split over 3 days (total : 225 minutes of instruction)
 - Teachers implement materials in intact classrooms
- Pre- and posttest
 - Learners were audio-recorded individually before and after the treatment
- Comprehensibility Ratings
 - Obtained from native speakers to assess pronunciation improvement



Method

- 3 experimental (treatment) conditions
 - **Explicit, Segmentals**: vowels /i, I, æ, and ε/
 - **Explicit, Suprasegmentals**: rhythm, stress related vowel reduction, linking, intonation
 - **Non-explicit**: no explicit instruction, with a combination of the same materials as other groups



Treatment



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Instructional Stages and Techniques	Group 1 Suprasegmentals	Group 2 Segmentals	Group 3 Non-explicit
<p>Presentation</p> <ul style="list-style-type: none"> Visual aids Oral introduction of topic 	<p>Introduction</p> <ul style="list-style-type: none"> Explicit instruction and analysis of suprasegmental features 	<p>Introduction</p> <ul style="list-style-type: none"> Explicit instruction and analysis of segmental features 	<p>Introduction</p> <ul style="list-style-type: none"> Pronunciation practice announced, with no explicit instruction
<p>Practice</p> <ul style="list-style-type: none"> Bottom-up skills Recognition tasks Discrimination tasks Minimal pair drills Analysis of words and phrases Reading short passages 			
<p>Production</p> <ul style="list-style-type: none"> Top-down skills Fluency activities 			



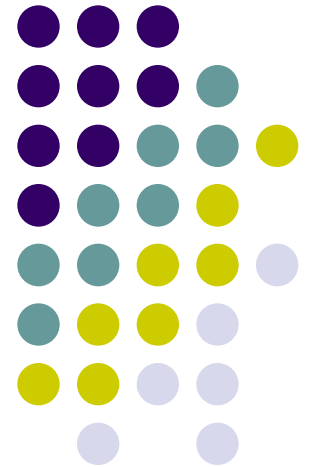
Let's look at some examples

- Explicit, segmental
- Explicit, suprasegmental
- Non-explicit



Pronouncing American English

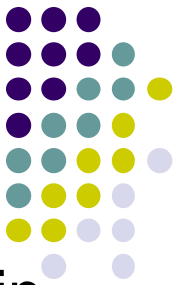
Vowels / i / and / ɪ /



Segmental



Vowels / i / and / ɪ /



- Vowels / i / and / ɪ / are different. The appropriate pronunciation of these two sounds marks differences in many English words. For example:



Peel



Pill



Jean
(name)

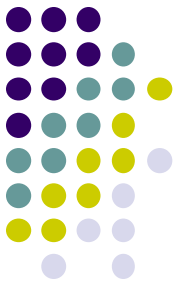


Gin

Segmental



Vowels / i / and / ɪ /



- Vowels / i / and / ɪ / are different in tenseness. Vowel / i / is tense and vowel / ɪ / is lax. This creates differences in the following words (and in many others):

/ i /

/ ɪ /

feet

fit

heat

hit

scene

sin

leak

lick

green

grin

Segmental

Vowel Chart of American English

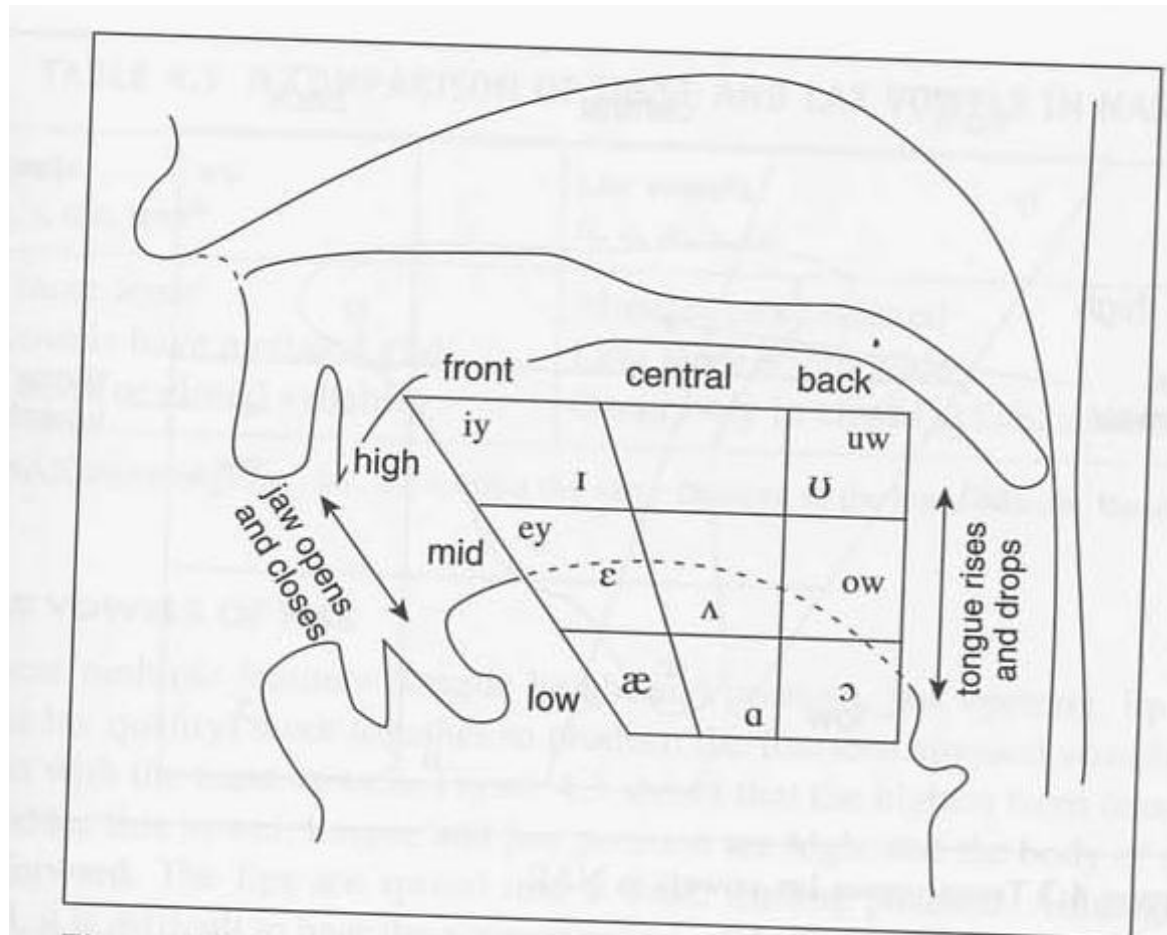
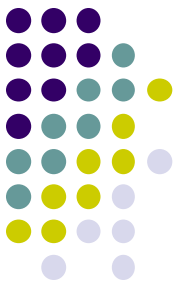
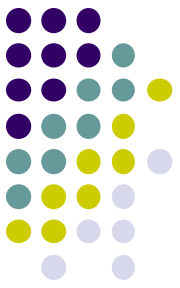


Figure 4.1 The NAE vowel quadrant and sagittal section of the mouth

Segmental



Vowel / i /



Listen to the pronunciation of the following words. Pay special attention to the sound /i/. Repeat after your instructor

-piece

-geek

-she

-beat

-meet

-lead

-read

-speed

-bleed

-brief

-clean

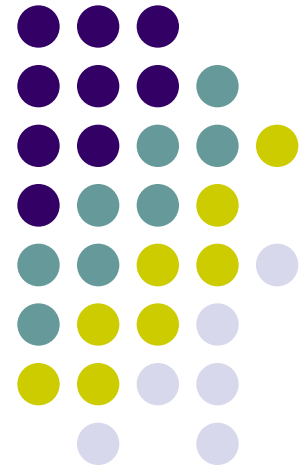
-bee

Segmental



Pronouncing American English

Stress & Rhythm in English



Suprasegmental



- Syllables and words in English contain “stress.” This means that some syllables in a word (or some words in phrases and sentences) are pronounced **longer**, **louder**, and **higher**.
- Stress can make a difference in the meaning of words and phrases. For example:



REcord



to reCORD

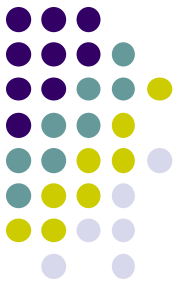


The WHITE House



A white HOUSE

Suprasegmental



Stress in English

- Words in English contain “stress.” This means that some syllables in a word are pronounced **longer, louder, and higher.**

Examples:

FAther

s**T**illness

for**G**ET

SISter

ad**V**ANTage

ob**T**AIN

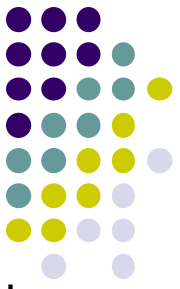
BETter

dis**C**Over

bal**L**OON

Suprasegmental

Stress in English



Just like in syllable words, some phrases and sentences are also pronounced longer, higher, and louder. Notice how all the following words, phrases and sentences are pronounced at a similar rate. Listen and repeat.



feeling

Did it!

Peel them



believe

You did?

It leaks



impatient

I see you.

We hit it.



guarantee

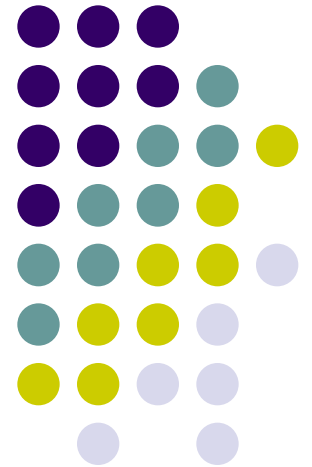
Have some fish.

Where's the beef?

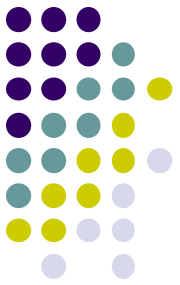
Suprasegmental



Pronouncing American English



Non-explicit



Listen & Repeat

- Listen to the pronunciation of the following words pronounced by your instructor. Listen first, then repeat.

father

stillness

forget

piece

geek

beat

sister

advantage

obtain

brief

clean

bee

better

discover

balloon

Non-explicit



Treatment



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Instructional Stages and Techniques	Group 1 Suprasegmentals	Group 2 Segmentals	Group 3 Non-explicit
Presentation Visual aids Oral introduction of topic	Introduction Explicit instruction and analysis of suprasegmental features	Introduction Explicit instruction and analysis of segmental features	Introduction Pronunciation practice announced, with no explicit instruction
Practice Bottom-up skills Recognition tasks Discrimination tasks Minimal pair drills Analysis of words and phrases Reading short passages	Guided practice on: Rhythm Stress & reduction Linking Intonation	Guided practice on: Individual vowels Vowel articulation Vowel contrasts Minimal pairs	Classroom drills on words, sentences and phrases.
Production Top-down skills Fluency activities	Communicative tasks: Pair discussion Group discussion Role plays Information gap activities	Communicative tasks: Pair discussion Group discussion Role plays Information gap activities	Communicative asks: Pair discussion Group discussion Role plays Information gap activities



Participants

	Group	Condition	N	TOEFL Score
Speakers	1: Learners	suprasegmental	12 (4)	499.41
	2: Learners	segmental	8 (4)	514.22
	3: Learners	non explicit	10 (4)	484.85
	Native speakers	baseline	10 (4)	
Listeners	Native speakers	comprehen- sibility rating	12	



Data Collection

- Delayed Sentence-Repetition Task (e.g., Guion, Flege, Liu, & Yeni-Komshian, 2000; Ratner, 2000; Trofimovich & Baker, 2006)
 - Prompt: “Have you seen Paul around?”
 - Response: **He was in the lab working.**
 - Prompt: “Have you seen Paul around?”
 - **Learner repeats the response**
- Sentences from pre- and post-test randomly presented to native judges



Speech samples

- Sentences were the same for all groups
 - **Example:** He was in the l[ae]b working
- Pre-test = 24 sentences
- Post-test= 48 sentences
 - 24 sentences (same as pre-test)
 - 24 new sentences (to verify improvement)
- Selected for analysis: **24 sentences per participant (8 pre + 16 post)** that were correctly produced
- 4 participants in each group remained (who did both pre- and post, AND got the full training, AND produced 24 sentences correctly)
 - 12 L2 participants
 - 4 L1 English native speakers included in the sample



Rating Task

- Comprehensibility ratings
- 9-point Likert Scale (Derwing & Munro, 1997; Munro & Derwing, 1995).
 - 1 = *extremely easy to understand*
 - 9 = *impossible to understand*
- Inter-rater reliability coefficient was very high (Cronbach's alpha: .92)



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Results

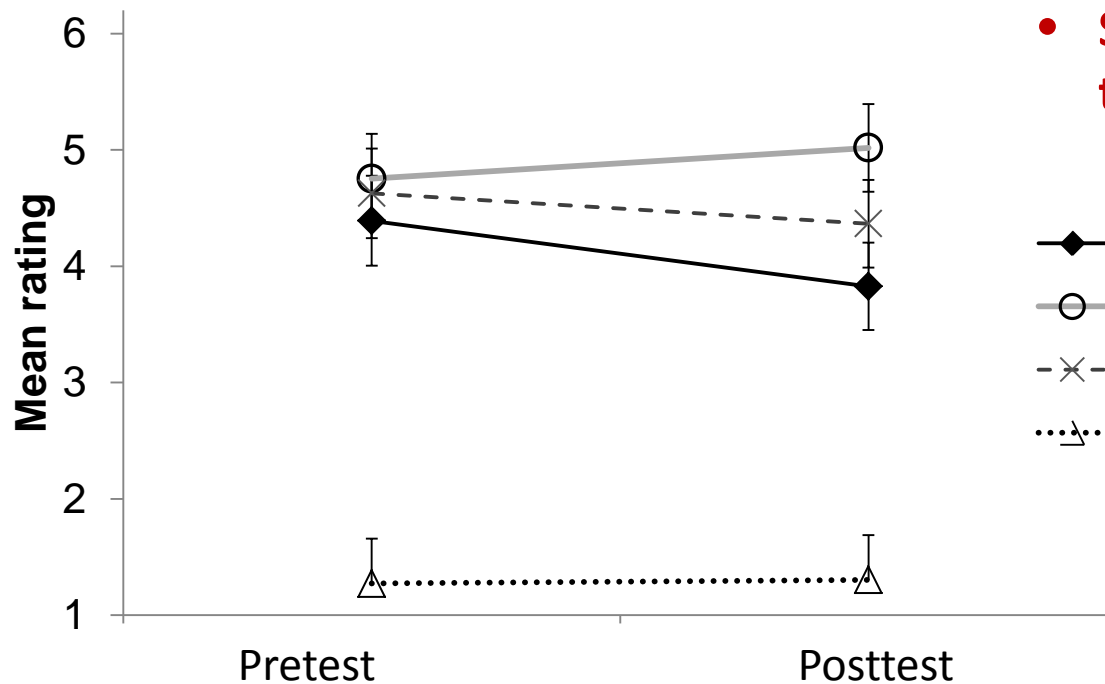


Effect of treatment

Learners only:

Mean Rating	M	SD
Pretest	4.4	0.18
Posttest	4.2	0.57

- Marginal improvement from pre- to post: $p = .072$
- Group difference : $p > .2$
- **Strong interaction between test and group: $p < .001$**



- ◆ Suprasegmental
- Segmental
- ×- Non-explicit
- ⋯△⋯ Native speakers

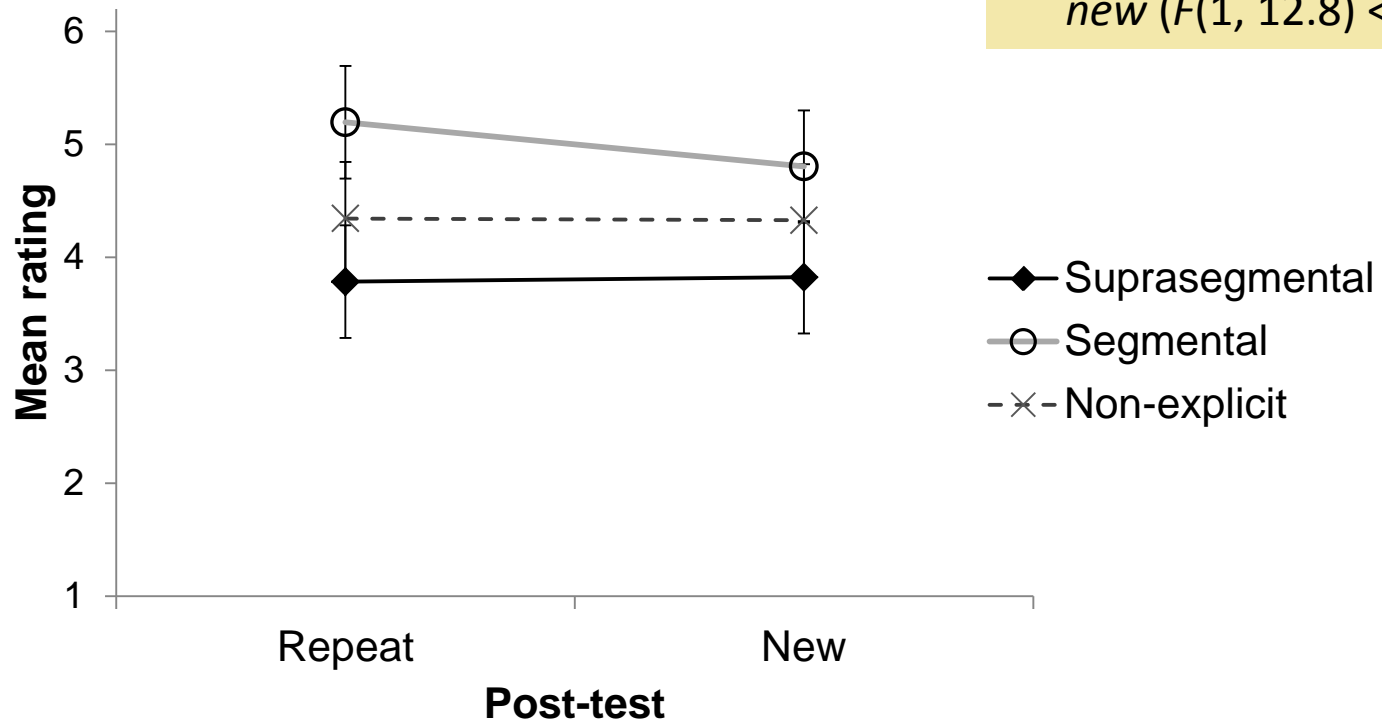
➤ performance on pre- and post test varied as a function of the treatment



Repeat vs. New sentences

- Post-test: No difference in ratings between „new“ and „repeat“ sentences

• no effect of *repeat vs. new* ($F(1, 12.8) < 1, p > .6$)





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Discussion of Results



Discussion of Results

- RQ1 Explicit vs. Non-explicit
 - Yes: Explicit phonetic instruction benefits L2 learners (Derwing, Munro, & Wiebe, 1998; Elliot, 1997; Lord, 2005; see also Couper, 2003)
 - BUT: In specific cases only?
 - Differences in focus of instruction (Segmental vs. Suprasegmental) yield different outcomes
- RQ2 Segmentals vs. Suprasegmentals?
 - Yes, suprasegmental instruction yields rapid improvement in comprehensibility



Segmental vs. Suprasegmental

- Segmental group seems to become **less** comprehensible
- Range effect?
- Limited scope of the vowel training compared to the suprasegmental training?
- Different learning curve of segmentals vs. suprasegmentals?



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Implications for teaching pronunciation



Implications for classroom instruction

- Explicit phonetic instruction on suprasegmental (global) features of pronunciation seems to work best in a short-term experiment (see Derwing, Munro & Wiebe, 1998)
- The learners **in the non-explicit group** did not significantly improve between pre- and posttest (marginal). Nevertheless, they maintained their rating
 - Perhaps slower improvement?



Implications for classroom instruction

- It appears that when explicit instruction is focusing on segmental (local) features, such as vowels only, increased attention to this specific feature (to the exclusion of others) may slow down pronunciation improvements in the short term (see also Schmidt, 1990, 2001; Derwing, Munro & Wiebe 1998)
- We argue that an explicit pronunciation curricular component in oral communication classes, paying attention to both segmental AND suprasegmental pronunciation features, can significantly improve comprehensibility, even in a short time (Darcy, Ewert and Lidster, in press)



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Thank you!

Questions and comments?

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	PARTICIPANT	NATIVE LANGUAGE	U.S. LOR	Length of learning
GROUP 1 „supra-segmental“	G1P01	Korean	2 months	13 years
	G1P02	Turkish	8 months	8 months
	G1P03	Arabic	5 months	10 years
	G1P04	Turkish	8 months	7 months
	G1P05	Arabic	6 months	(information not given)
	G1P08	Turkish	7 months	1 year
	G1P11	Japanese	3 months	7 years
GROUP 2 „segmental“	G2P01	Portuguese	2 months	6 years
	G2P02	French	7 months	8 years
	G2P03	Russian	1 month	3 years
	G2P04	Arabic	5 months	10 years
	G2P05	Korean	1 year	5 years
	G2P06	Japanese	6 years	21 years
	G2P07	Korean	9 months	5 years
	G2P08	Japanese	9 months	4 years
GROUP 3 „NON-EXPLICIT“	G3P01	Arabic	5 months	10 years
	G3P03	Korean	1 week	6 years
	G3P04	Korean	1 month	10 years
	G3P05	French	6 months	8 years
	G3P06	Turkish	7 months	7 years
	G3P07	Arabic	5 months	3 years
	G3P08	Arabic	1 year	1 year