L1 intonational categories as “perceptual attractors”during L2 imitation

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INTRODUCTION

○ In L2 learning, native (L1) phonological representations act as "perceptual attractors" to which similar non-native sounds are assimilated [1, 2];

○ Competition with the inventory of the language/dialect of origin modulates segmental imitation by selective processes [3]

○ Phonological properties of a speech sound replace its phonetic properties with the passing of time [4], e.g., by matching to exemplars or by rehearsal of articulatory programs [1, 5].

Intonation?

○ Speakers reproduce the phonological form of an utterance, not its phonetic details [6];

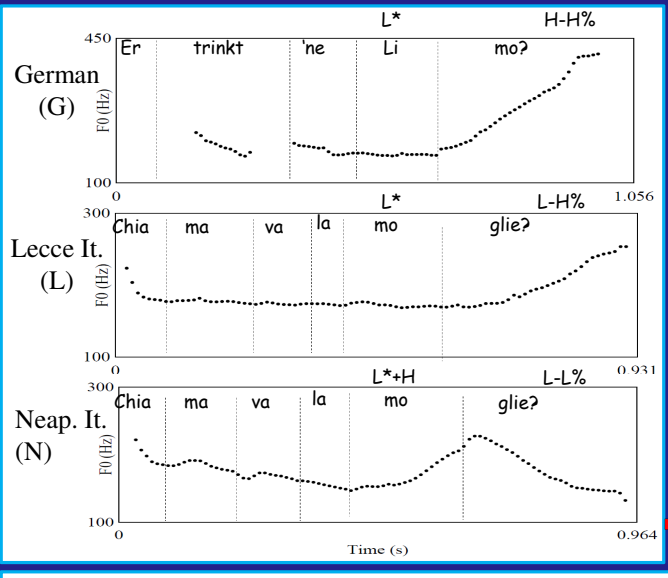
BUT: When imitating non-native dialects, the f0 contour is partly modified to approximate the target dialect [7].

Questions (Q) [8, 9]		
(Northern Standard) German	L* H- H%	Steep rise right after the f0 valley
Lecce Italian	L* L- H%	Shallow rise, late rise onset
Neapolitan	L*+H L-L%	f0 Rise-fall

Hypotheses

H1: Lecce speakers will be less accurate in imitation since they perceive German contours as variants of their native dialect contours

H2: Less accurate reproduction when imitation is delayed/rehearsal is reduced because of a decay of detailed F0 memories.



Wavelet-based functional mixed model [10]:

○ Evaluate effects of experimental factors on the f0 contours within the target words:

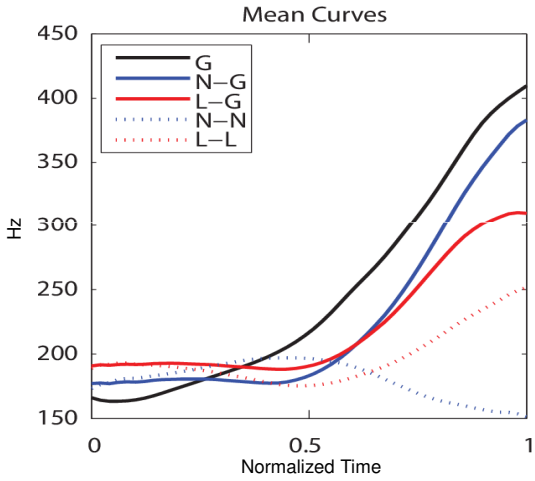
(1) Discrete Wavelet Transform (DWT) to obtain a set of wavelet coefficients;
(2) Markov chain Monte Carlo simulation to get the posterior samples for quantities in the wavelet space version of the functional mixed model;
(3) Inverse DWT to convert these quantities back to data space.

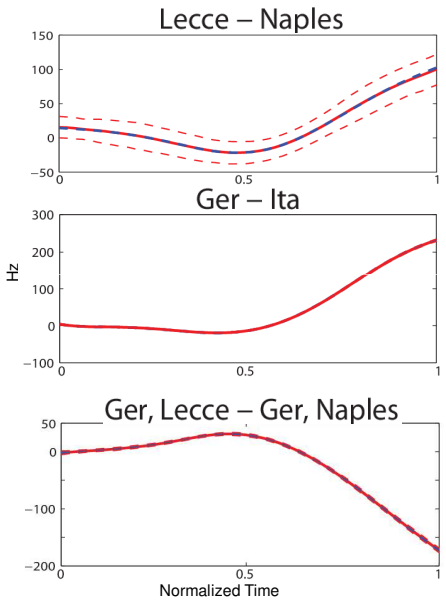
- Fixed factors: Variety, language, memory, repetition;
- Full random structure.

➡ Capture changes of f0 in time without assumptions about f0 shape.

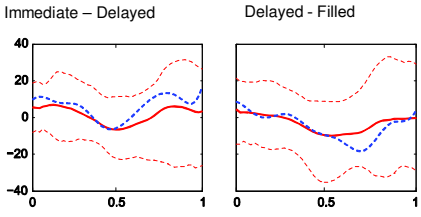
RESULTS

1. Language interference





2. Memory



○ Neapolitans better imitators than Lecce Italians:
-Shift from rise-fall to rising f0 curve in Neapolitan;
- Final f0 rise shallower and lower in Lecce It.

○ No effects of memory

CORPUS & METHODS

○ Shadowing:

Baseline Task	Main Task
Prendeva la **nave**? *Did s/he travel by ship?*	Er malt 'ne **Blume**? *Does he paint a flower?*
Guardava il **mare**? *Did s/he look at the sea?*	Er trinkt 'ne **Limo**? *Does he drink a lemonade?*
Stringeva la **mano**? *Did s/he shake hands?*	Sie isst 'ne **Möhre**? *Does she eat a carrot?*
Spalava la **neve**? *Did s/he shovel snow?*	Er baut 'ne **Mühle**? *Does he build a mill?*
Bruciava il **legno**? *Did s/he burn wood?*	Er mag **Salami**? *Does he like peperoni?*
Chiamava la **moglie**? *Did s/he call the wife?*	Er spielt **Violine?** *Does he play violin?*
Comprava la **lana**? *Did s/he buy the wool?*	Sie haben'ne **Waage**? *Do they have a balance?*
Cambiava **lavoro**? *Did s/he get a new job?*	Er sucht **Maroni**? *Does he look for chestnuts?*

○ Imitators with no knowledge of German

○ "Memory" conditions: Speaking onset at the end of Q (Immediate), after a silent pause of 4 s. (Delayed) or an answer of 4 s. to Q (Filled).

8 Qs * 2 Tasks * 3 Memory Conditions * 16 Imitators (8 Lecce + 8 Neap.) * 5 Repetitions = 3840 obs..

DISCUSSION

○ **Language interference:**
- Neapolitan: Imitation of German Qs not mediated by grammar -> + attention to acoustic details;
- Lecce it.: Phonological ambiguity -> Speakers rely on phonetic implementation rules of their own variety.

○ **No memory effects:**
- no rehearsal for continuous f0?
- too simple task?

➡ Increase cognitive load by increasing linguistic (i.e. syllabic) complexity (in progress)

CONCLUSION

○ Similarly to the segmental level, intonation is anchored by native prosodic representations.

○ Functional mixed models: New paradigm for exploring intonation.

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