Testing the distinctiveness of intonational tunes: Evidence from imitative productions in American English

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INTRODUCTION

Understanding the structure of intonational variation is a longstanding issue in prosodic research. A given utterance can be realized with countless intonational contours, and while variation in prosodic meaning is also large, listeners nevertheless converge on relatively consistent form-function mappings. This consistency suggests the existence of abstract intonational representations, but it has been unclear how exactly these are defined.

Pierrehumbert 1980: For American English, every intonational phrase (IP) ends in a sequence of three tonal components: a pitch accent, a phrase accent, and a boundary tone.

METHODS

Male and female model speaker
3 model sentences x 8 contours

“She quoted Helena”
“Her name is Marilyn”
“He answered Jeremy”

Summary statistics of speaker-specific f0 used in synthesis parameterization

Selected flat exemplars (LLH, LLL) to use as the base for the synthesized f0 overlay

RESULTS

Nuclear f0 contours
Averaged by participant and tune

Deviation Analysis
Deviation between raw f0 contour and model speaker average

Tune
1. HHH
2. LHH
3. LLL
4. HLH
5. LLH
6. HHL
7. LLL
8. LHL

RMSE
0.90
0.79
0.48
0.46
0.44
0.43
0.43
0.37

Four optimal clusters from non-rising averaged contours

SUMMARY

The distinction between rising and non-rising f0 contours is readily accessible in speech perception and production for American English listeners and speakers

Among the non-rising contours produced, four contour types emerged:
Flat-mid
Mid-falling
Low-to-mid
Low

Non-rising contours were imitated with less precision. Possible explanations:
• The f0 resynthesis did not succeed in tapping into the intended phonological representations
• Difficulty accessing an appropriate meaning hindered the ability to reproduce a target intonation

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