/u/-fronting in RP and the implications of perceptual integration of lip gestures for sound change processes

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INTRODUCTION

- diachronic /u:/-fronting in the Standard accent of English, RP, has been shown to be associated acoustically with F2-raising

- investigation of two unresolved issues to do with this sound change in progress

RESULTS

- /i:/ was perceived as /i:/ in the visual (Fig. 1), auditory, and audiovisual-dubbed condition (Fig. 3)

- /o:/ was classified as /o:/ in the auditory and audiovisual dubbed condition (Fig. 3), but confused with /u:/ in the visual condition (Fig. 1)

- /u:/ was
  - unambiguously classified as /y:/ in the auditory and audiovisual-dubbed condition (Fig. 3)
  - identified either as /y:/ or /u:/ in the visual condition (Fig. 1), i.e. /u:/ was produced with lip-rounding
  - confused with /i:/ in the audiovisual, cross-dubbed condition when auditory /u:/ was presented together with visual /i:/ (Fig. 2)

RESEARCH QUESTIONS

1. Has /u:/-fronting come about just because of tongue fronting, or have the lips also spread?
2. If lip-rounding is maintained, then is this because it is a necessary visual cue to prevent a perceptual confusion of a fronted /u:/ with /i:/?

QUICK POSTER TOUR

PREDICTIONS

German listeners of English identify
- the control stimuli /i:, o:/ (in *heed*, *hoard*) as such
- target stimulus /u:/ as /y:/ if it is produced with lip-rounding, otherwise as /i:/
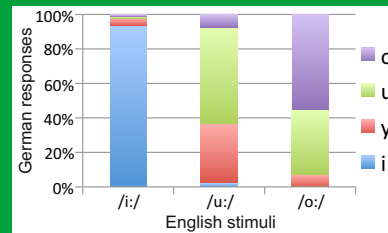
Visual condition

Fig. 1: Responses in visual condition.

Research Question 1: YES
- English fronted /u:/ was produced with lip-rounding.

Audiovisual, cross-dubbed condition I
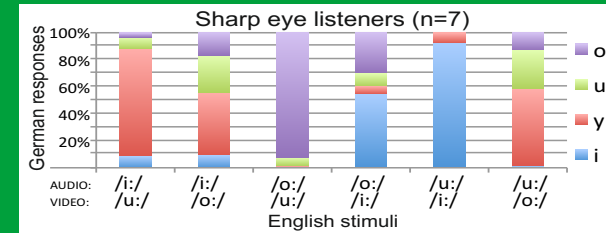

Sharp eye listeners (n=7)

Fig. 2: Sharp eye responses to audiovisual, cross-dubbed stimuli.

Research Question 2: MAYBE
- some listeners perceptually integrated the visual cue lip-posture
- this visual cue may also be used by English listeners to prevent a perceptual confusion of fronted /u:/ with /i:/
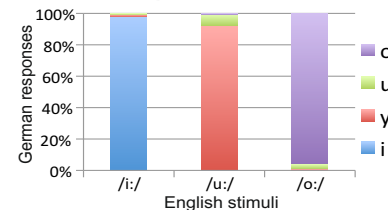
METHOD

- audiovisual perception experiment

- 16 L1-German listeners identified tokens of *heed*, *hoard*, and *who'd* produced by one young, female RP speaker in three presentation modes

  I.   visual condition

  II. audiovisual condition with dubbed and cross-dubbed stimuli with pink noise

  III. auditory condition with pink noise

- 4-Alternative-Forced-Choice Task: /i:/, /y:/, /u:/, or /o:/

- L1-German listeners were chosen because German distinguishes /i:/, /u:/, and /y:/ (whereas in English only /i:/ and /u:/ are contrastive)

Audiovisual, dubbed condition

Fig. 3: Responses for audiovisual, dubbed stimuli.

Audiovisual, cross-dubbed condition II
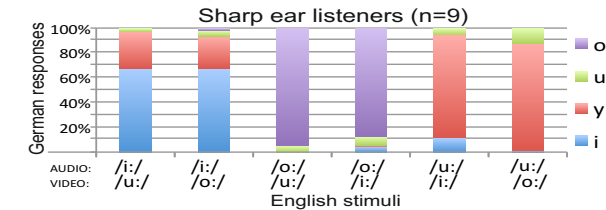

Sharp ear listeners (n=9)

Fig. 4: Sharp ear responses to audiovisual, cross-dubbed stimuli.

DISCUSSION & CONCLUSION

- English fronted /u:/ was produced with lip-rounding
- two different lip-rounding gestures for back vs. front rounded vowels
- McGurk effect: visual cues were perceptually integrated in the perception of close front vowels by some German listeners
- lip-rounding gesture may also be necessary for RP listeners to avoid a perceptual merger of /i:/ and fronted /u:/