

The interlanguage speech intelligibility benefit: Arabic-accented English

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INTRODUCTION

- The linguistic backgrounds of talkers and listeners play important roles in the intelligibility of speech
- In general, native listeners find native speech more intelligible than non-native speech (e.g., van Wijngaarden 2001)
- Interlanguage Speech Intelligibility Benefit (ISIB;** Bent & Bradlow 2003): Non-native listeners can be as accurate at recognizing words in sentences produced by a proficient non-native speaker with whom they share the same native language as words produced by a native speaker
- Two types of ISIB** (Hayes-Harb, Smith, Bent & Bradlow under review):

ISIB for Non-Native Talkers (ISIB-T)	Non-native speech is at least as intelligible as native speech to non-native listeners (i.e., for non-native listeners, non-native talkers > native talkers)
ISIB for Non-Native Listeners (ISIB-L)	Non-native speech is at least as intelligible to non-native listeners as to native listeners (i.e., for non-native speech, non-native listeners > native listeners)

- Hayes-Harb *et al.* found evidence for the ISIB-L but not the ISIB-T

RESEARCH OBJECTIVES & HYPOTHESES

- Test the generalizability of the Hayes-Harb *et al.* and the Bent & Bradlow findings, in this study with word-initial bilabial stop voicing contrasts (/p/ vs. /b/)
- Investigate the acoustic properties of word-initial bilabial stop voicing contrasts in native English speech and Arabic-accented English speech

INTELLIGIBILITY STUDY

Listeners

- Native Arabic speakers with low English proficiency (NA; n=7); native English speakers (NE; n=11)

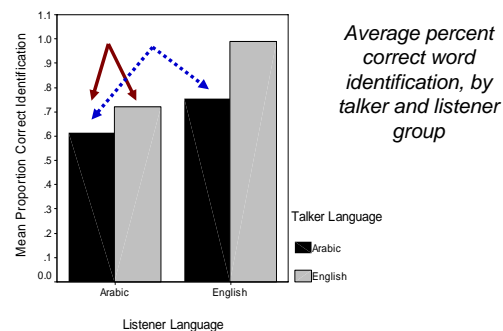
Talkers and Stimuli

- 3 different tokens of each of 8 English target words produced by each of 3 NE and 3 NA talkers (low-intermediate English proficiency)
- Target words formed 4 pairs contrasting /b/ and /p/ word-initially (bat-pat; ban-pan; bet-pet; buy-pie)

Procedure

- Listeners identified words in isolation in a forced-choice task
- The two choices available formed a pair (e.g., hear *bat*; identify as *bat* or *pat*)

Results



- NA Listeners: No effect of talker language** (p<.067); consistent with the ISIB-T
- NA Talkers: NE listeners > NA listeners** (p<.001); not consistent with the ISIB-L

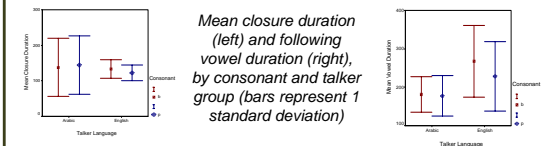
- **NA and NE listeners find NE speech more intelligible than NA speech**
- **NE listeners were more accurate than NA listeners at identifying words produced by NA talkers (evidence against ISIB-L)**
- **But note nearly-significant effect of talker language for the NA listeners (evidence against the ISIB-T?)**

ACOUSTIC STUDY

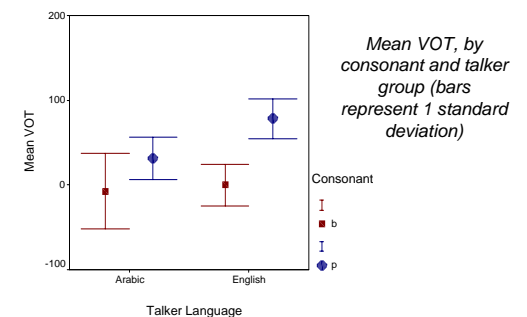
Procedure

- Acoustic analysis of the intelligibility study stimuli
- Measured closure duration, following vowel duration, and voice onset time (VOT)

Results



- **NE and NA speakers manipulate closure duration and following vowel duration similarly in their productions**



- **NE speakers differentiate /b/ and /p/ on the VOT dimension; NA speakers demonstrate overlap in the VOT of /p/ and /b/ (note also the overlap between the VOT of NE /b/ and NA /p/)**

CONCLUSIONS

- Support for the ISIB-T but not the ISIB-L
- NE and NA talkers differed in their use of VOT to differentiate /b/ and /p/
- Discrepancies between these and earlier findings may result from:
 - Different native language of the non-native subjects
 - Different proficiency levels of the non-native subjects
 - Different task demands (words in sentences versus words in isolation)

