

# ***NON-NATIVE TALKERS AND LISTENERS AND PERCEPTUAL BENEFITS OF CLEAR SPEECH***

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# Introduction

## Clear speech: a speaking style adopted when fluent communication is compromised

- A benefit (i.e. enhanced speech intelligibility) of native clear speech has been well-established for various listener populations.
  - Native listeners: normal-hearing listeners (Ferguson & Kewley-Port, 2002), hearing-impaired listeners (Picheny et al., 1985)
  - Non-native listeners (Bradlow & Bent, 2002; Bradlow & Alexander, 2007)
- Little is known for a benefit of **non-native** clear speech.
  - It was less effective than native clear speech for native listeners (Rogers et al., 2010).
  - It was as effective as native clear speech for non-native listeners (Smiljanic & Bradlow, 2011).
- The current study further examined a non-native clear speech benefit, exploring the Korean-English pair.



# Research Questions

- To what extent does talkers' L1 affect the degree of the clear speech benefit?
- To what extent does listeners' L1 affect the degree of the clear speech benefit?
- To what extent does talker-listener combination affect *interlanguage speech intelligibility benefit* (ISIB)?
  - Does sharing the same L1 provide an additional benefit in speech perception?



# Methods

- Talkers: 4 native English (2M2F) and 4 native Korean speakers (2M2F)
- Listeners (32 for each group):

Group	Talkers' L1	Listeners' L1	L1-matched?
1	English	English	Match
2	Korean	English	Mismatch
3	English	Korean	Mismatch
4	Korean	Korean	Match

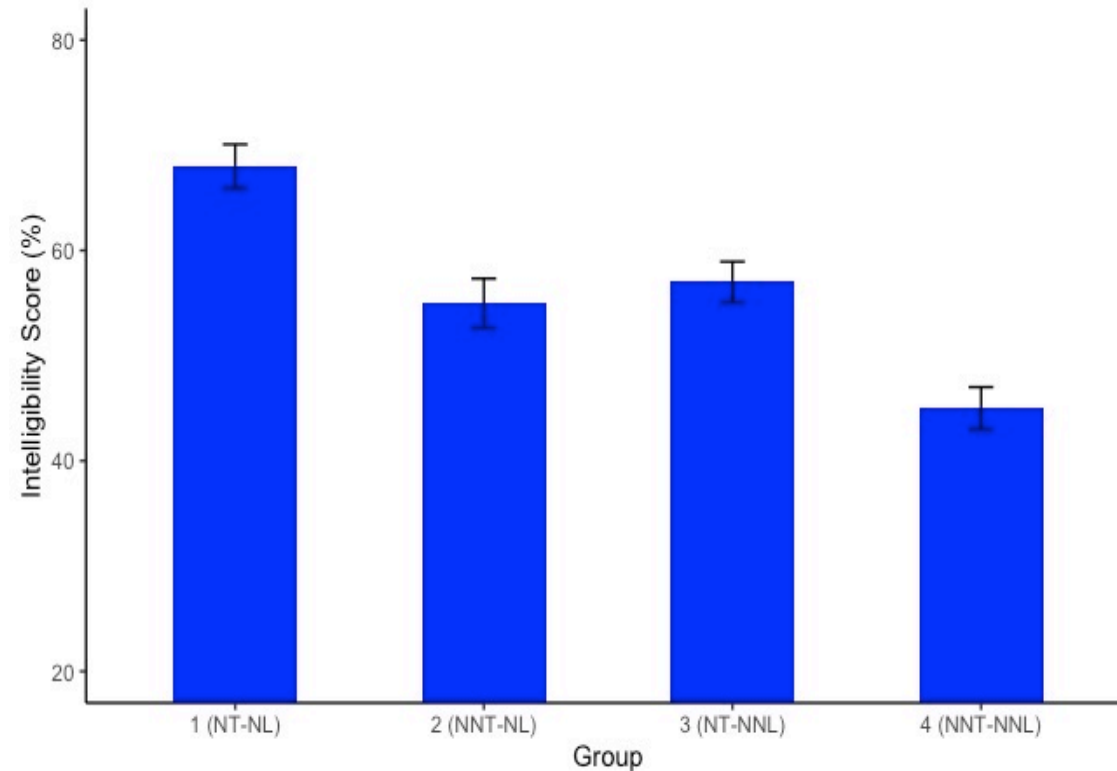
- Stimuli: 20 anomalous English sentences (Nye & Gaitenby, 1974) mixed with a speech-shaped noise at 0dB SNR.
- Procedures:
  - 10 sentences were presented in clear speech first, and then in casual speech.
  - The number of correct keywords for each sentence was calculated and then converted to rationalized arcsine transform units (RAU) (Studebaker, 1985).



# Results (1)

## Intelligibility score across speaking styles

- Group 1 (NT - NL) showed the highest intelligibility score.
- Group 4 (NNT - NNL) showed the lowest intelligibility score.
- For the overall intelligibility score, ISIB was not observed.
- For non-native listeners, non-native English was less intelligible than native one.



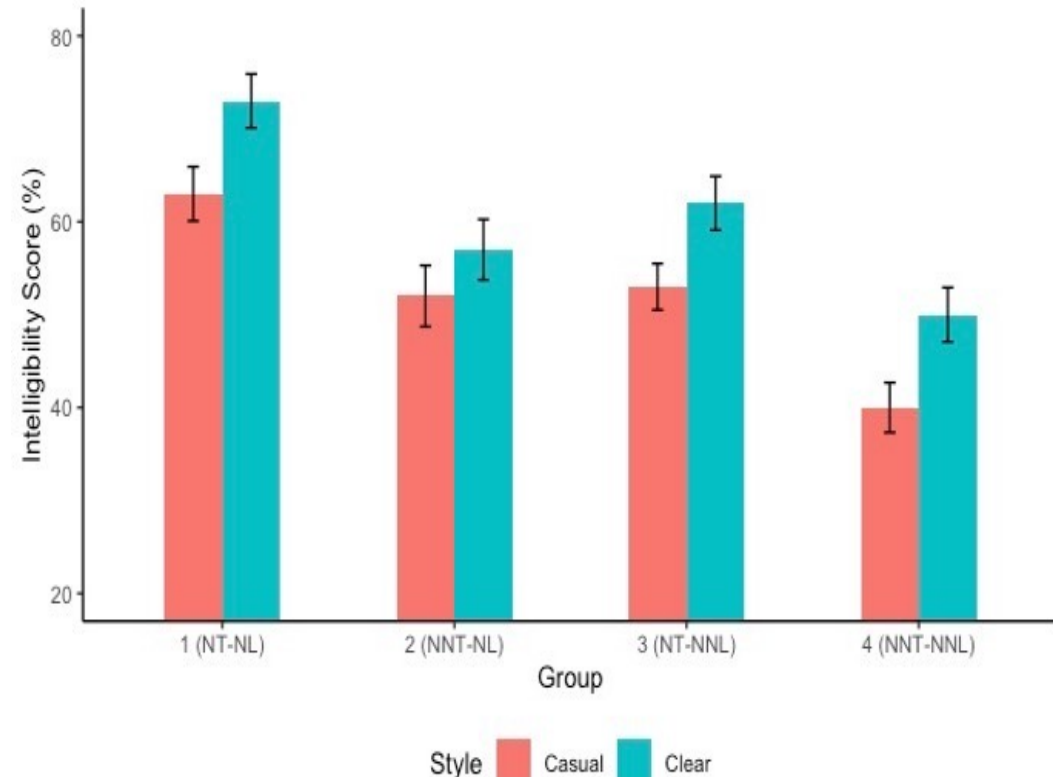
N: Native  
NN: Non-native  
T: talker  
L: listener



## Results (2)

### Intelligibility score between speaking styles

- All fixed effects (Talkers' L1, listeners' L1, and speaking style) were significant.
  - Native English speech is more intelligible than non-native English speech ( $\beta = -13.31$ ,  $SE = 4.02$ ,  $p < .01$ ).
  - Native English listeners recognized speech-in-noise more accurately than non-native listeners did ( $\beta = -12.84$ ,  $SE = 4.04$ ,  $p < .01$ ).
  - Clearly produced speech was more intelligible than casually produced ones ( $\beta = 11.13$ ,  $SE = 2.32$ ,  $p < 0.001$ ).
- There were no significant interactions between fixed effects.



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## *Discussion & Conclusion*

- ISIB was not observed as for the overall intelligibility score.
  - Korean-accented English was less intelligible than native English for Korean listeners.
  - Having the same L1 did not facilitate speech perception.
- There was no significant interaction between talkers' L1 and speaking style.
  - Non-native talkers were able to elicit a clear speech benefit in a comparable manner compared to native talkers.
- There was no significant interaction between listeners' L1 and speaking style.
  - Non-native listeners were able to utilize enhanced acoustic parameters produced in their L2.
- ISIB was observed in terms of the magnitude of the clear speech benefit.
  - Non-native clear speech was more effective for non-native listeners than it was for native listeners.



# *THANK YOU!*

Questions/comments can be directed to [yejeejung@purdue.edu](mailto:yejeejung@purdue.edu).

Special thanks to Dr. Alexander Francis at Purdue University for his guidance on stimuli development.

