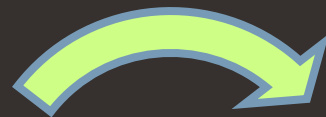


Miscommunications in triadic conversations:

*Effects of hearing loss,
hearing aids,
and background noise*

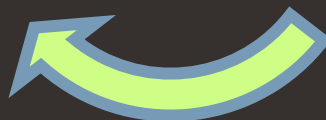
Eline Borch Petersen,
Martha Sophia Reenberg Munck,
Anja Kofoed Pedersen





Listen

Respond



25 triads:

YNH ~27.2 yo
ONH ~54.8 yo
HI ~72.8 yo

Low noise
50 dB noise

High noise
75 dB noise

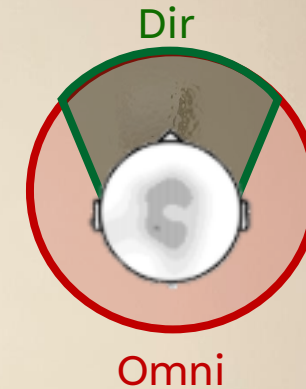
Unaided

Omni

Aided (omni)

Dir

x 3 repetitions x 4 min = 25 h



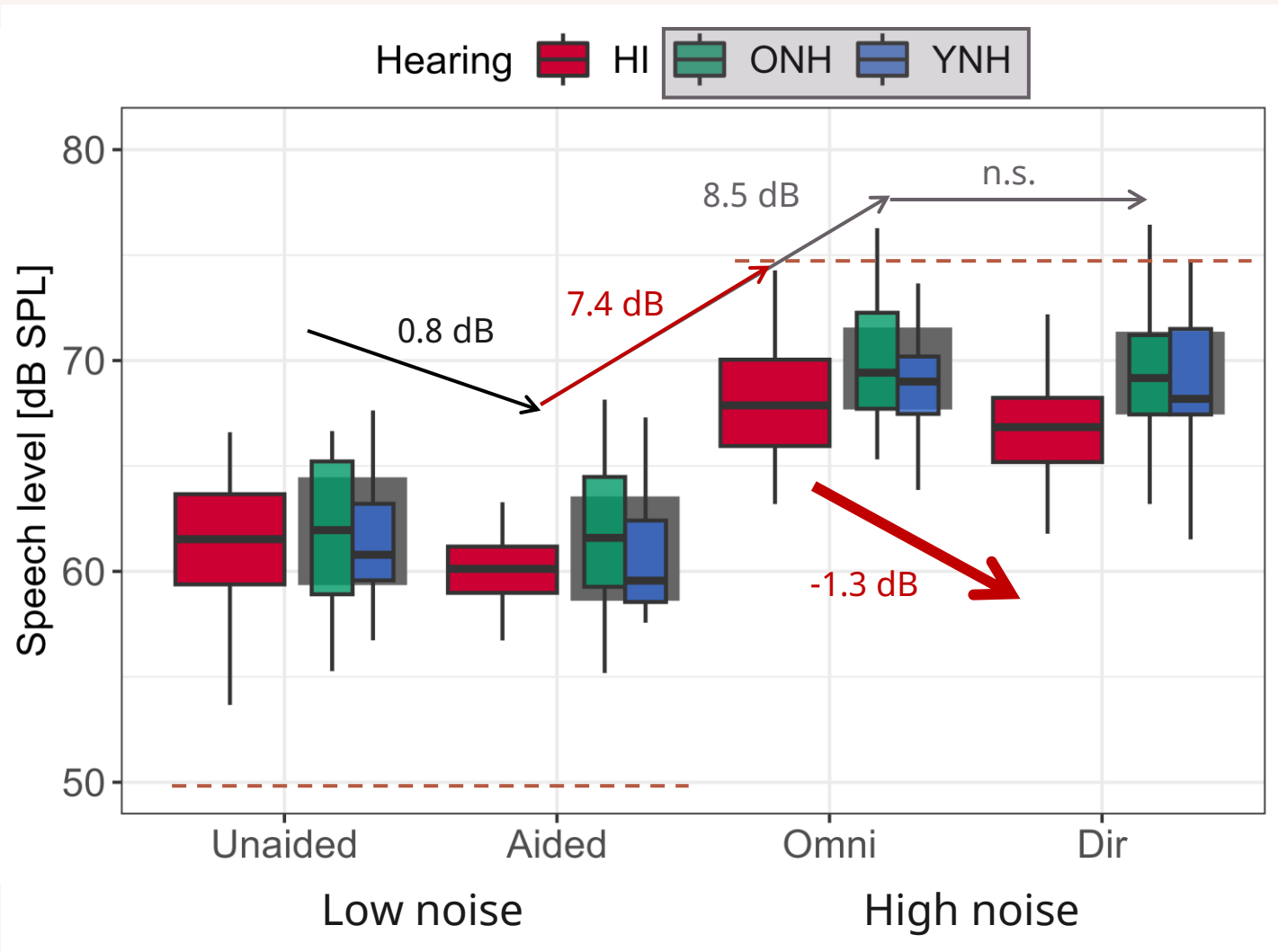
Older
Hearing Impaired
(HI)

Younger
Normal Hearing
(YNH)

Older
Normal Hearing
(ONH)

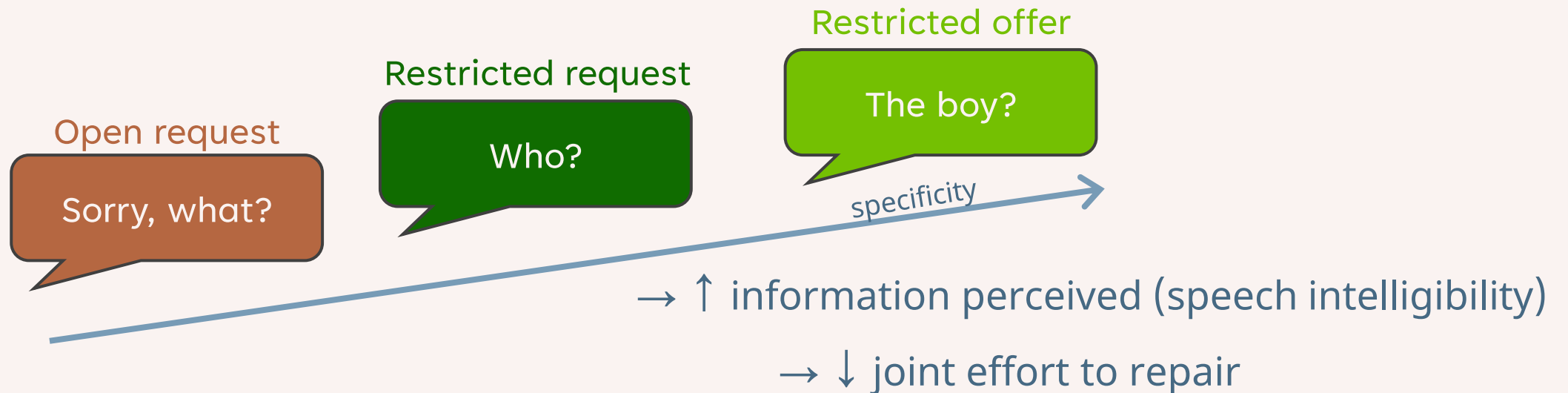
* From hereon YNH and ONH will be treated at one group of NH

Speech levels



Speech intelligibility ~ Miscommunications

- Miscommunication : Asking for clarification or not responding/reacting as expected
- Other-Initiated Repairs (OIR)
 - Asking for clarification of problematic speech to start a joint repair [Schegloff et al. 1997]
 - Formulation of OIRs matter [Dingemanse et al. 2015]



Speech intelligibility ~ Miscommunications



[Rasenberg et al. 2022]

If possible, specific OIRs are produced to not disrupt the conversational flow

OIR and hearing loss



→ In free dyadic conversations, HI have more OIRs and a **larger proportion are open**

[Laakso et al., 2019; Lind et al., 2004, 2009; Pajo, 2013; Pajo & Laakso, 2020, 2023]

→ HI make more meta-comments (**open OIR**) like 'I cannot hear anything'

[Ekberg 2020]

→ Mild-to-moderate HI = NH, moderate to severe HI have more OIRs

[Pajo and Laakso, 2020]

Above studies have many hours of 1:1 conversation,
but from few individuals

*In triads, one person can completely withdraw
and there would still be a conversation*

Miscommunications

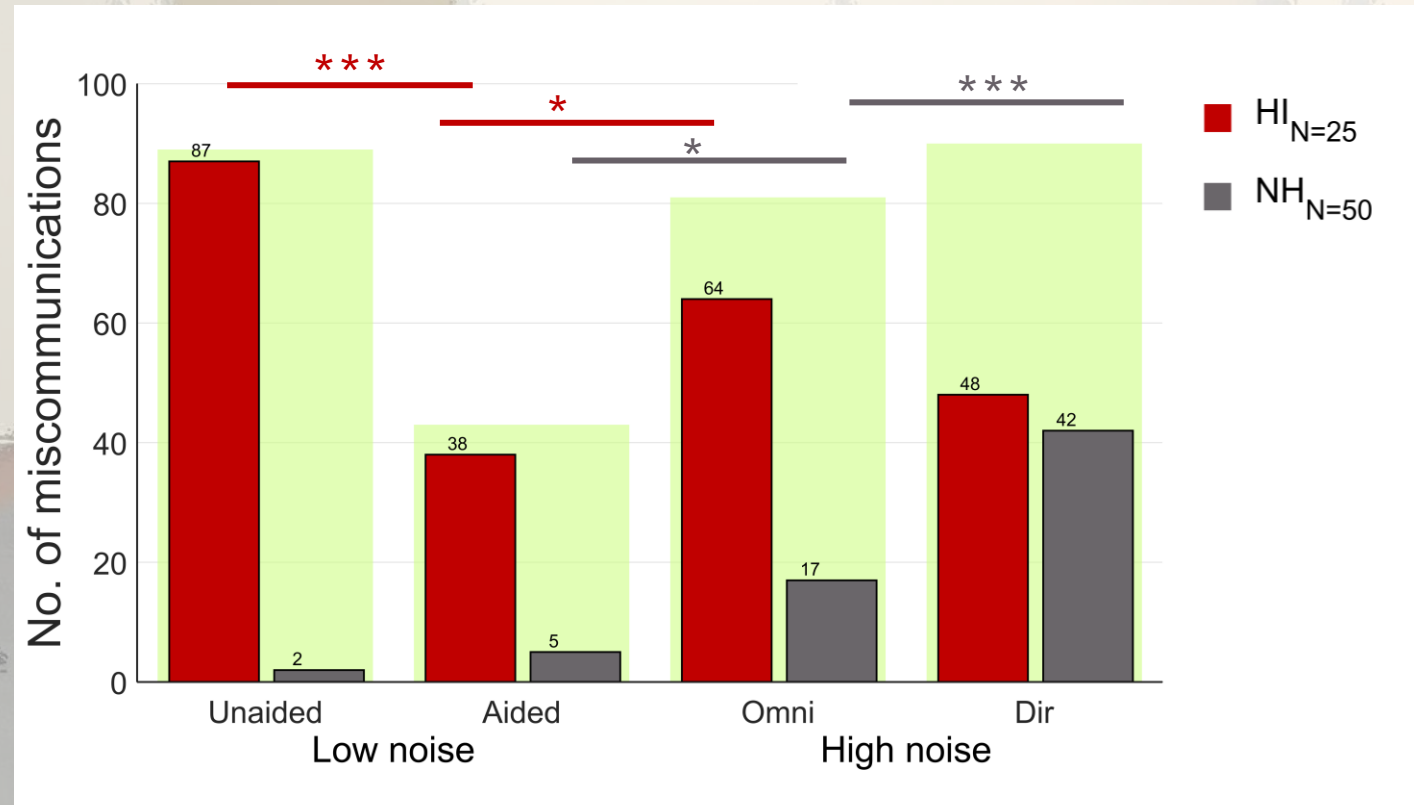
→ Conversation Analysis: Identify, transcribe, and categorize all miscommunications

→ ~0.2 miscommunication / min

→ Higher for HI when unaided

→ Higher for all in more noise

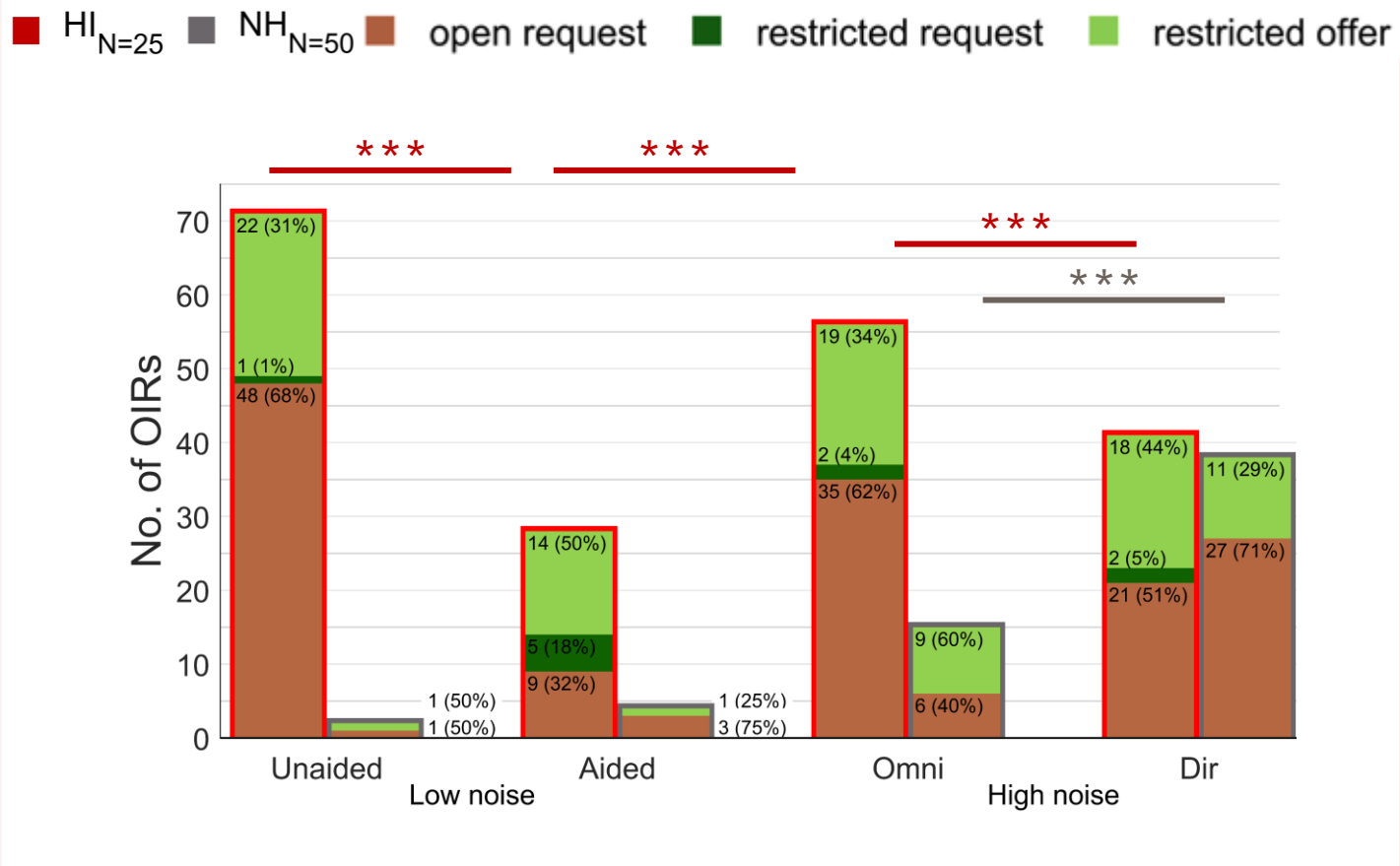
→ Higher for NH when HI has directional sound processing



OIR type and proportion



- Non-OIRs include: No response, not correcting or later reveal miscommunication
 - Very few **restricted requests**
 - **Open requests** > **restricted (request + offer)**
- Higher **%open requests** when:
 - **HI is Unaided vs Aided**
 - **Noise increase (only HI analyzed)**
 - **HI listen to Omni vs Dir**
 - For NH when HI listen to Dir vs Omni



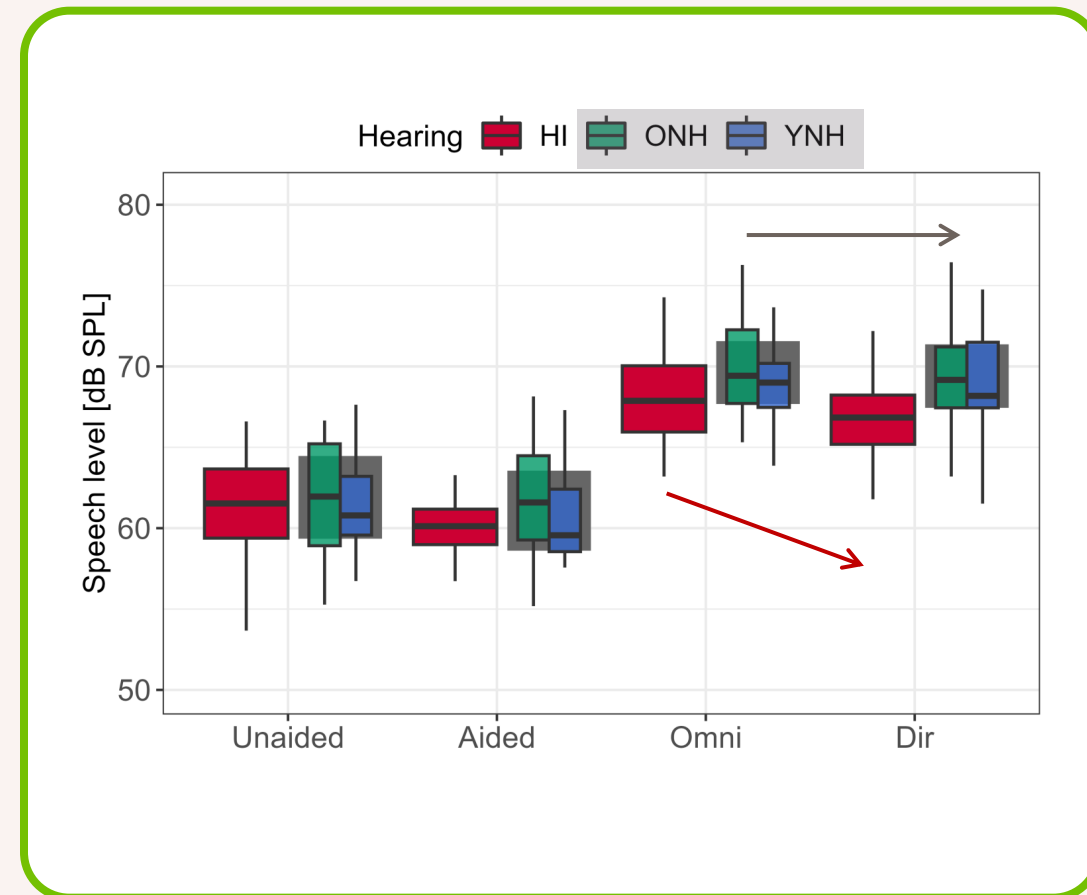
Summary and explanation

Hypothesis:

↑ Speech intelligibility → ↓ miscommunications + ↓ %open OIRs

Results confirming the hypothesis:

- ✓ **HI** is aided (low noise)
- ✓ Noise level is lower
- (✓) **HI** listen to Dir (% open OIRs only)
- ? **NH** when **HI** listen to Dir
 - HI** is trouble source 68.8% of OIRs in Omni
 - 89.5% of OIRs in Dir



Summary and explanation

Hypothesis:

↑ Speech intelligibility → ↓ miscommunications + ↓ %open OIRs

Results confirming the hypothesis:

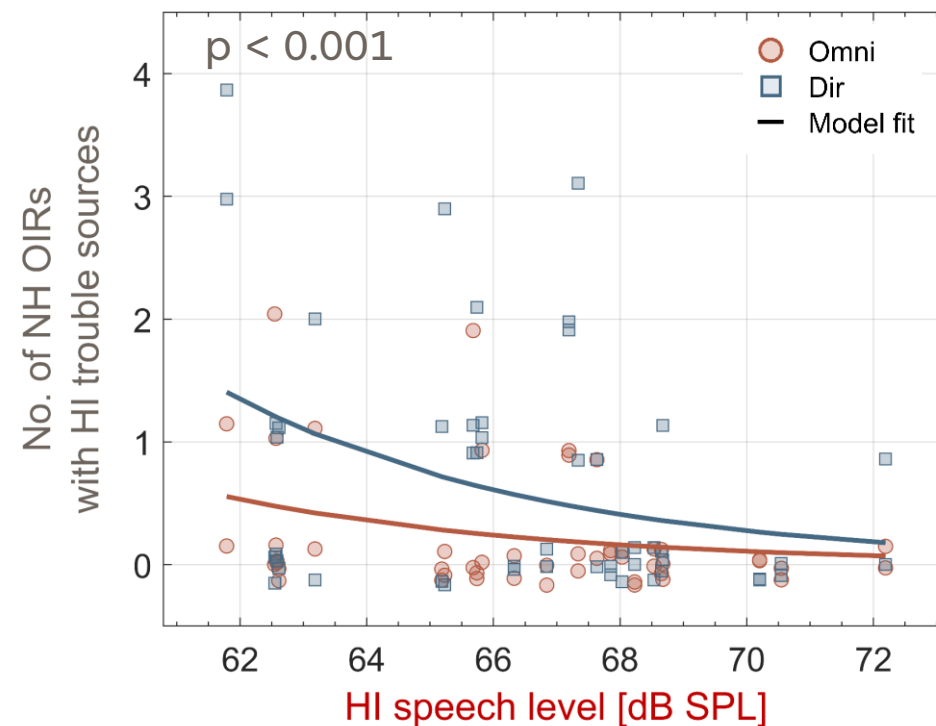
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From every 4-min conversation:

HI speech levels across conversation

No. of NH OIRs with HI trouble source

↑ **HI speech level** → ↓ OIRs made by NH



Conclusion

- 1) Miscommunications and %open OIRs provide valuable insights
 - Sensitive to background noise and individual hearing difficulty (Aided, Dir, speech level)
- 2) One (HI) interlocutors experience can affect the entire group
 - HI listening to Dir processing cause poorer speech intelligibility for NH interlocutors
 - Caused by reduced speech levels for HI interlocutors
 - Relation between no. of NH OIRs and speech level of the HI interlocutors

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