

Introduction

- A child's language environment plays an important role in their language development, which in turn affects their future success ⁽¹⁾
- Use of formal child care has grown, yet little is known about the language environment of these settings ^(2, 3)
- Of particular concern is a child's ability to understand and learn from speech under noisy conditions ⁽⁴⁾
- To date: **no systematic comparisons** of language environments across child care settings exist
- The current study examined the quality of the sound environment of toddlers in homes versus daycares

Participants

- Child Care Settings of toddlers 13–31 months old

12 Daycare Centers

7 Home Daycares

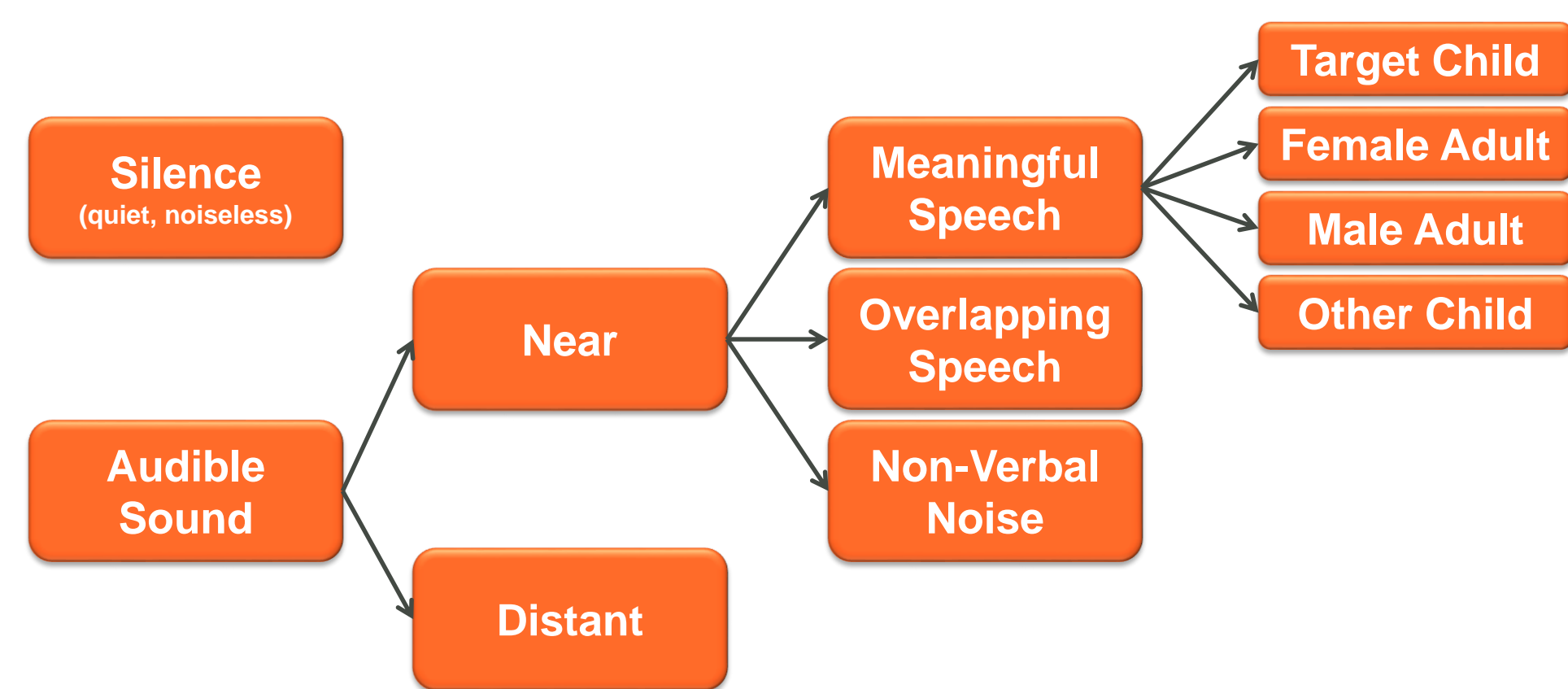
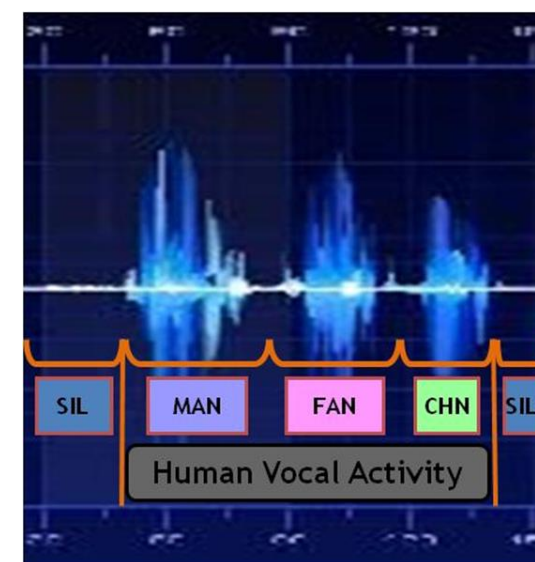
14 Homes

- 2-6 multi-hour recordings per participant

Data Collection

LENA:

- Small, lightweight recording device worn by child
- Automated analysis divides recording into segments



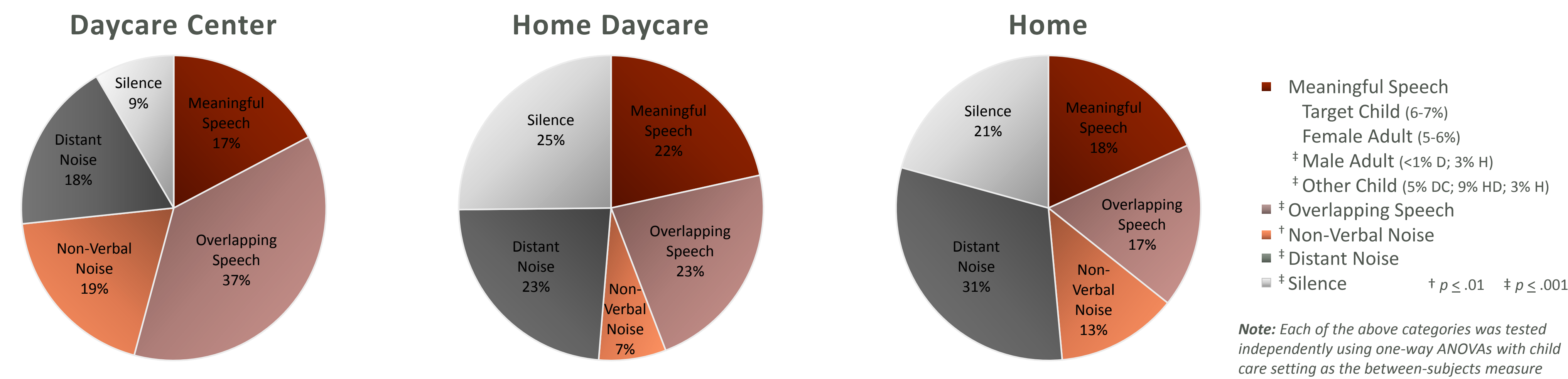
- Extracted activity level data using LENA's ADEX tool, creating a table for each recording
 - Tables contained name, duration, and start time of each segment

PRAAT: ⁽⁵⁾

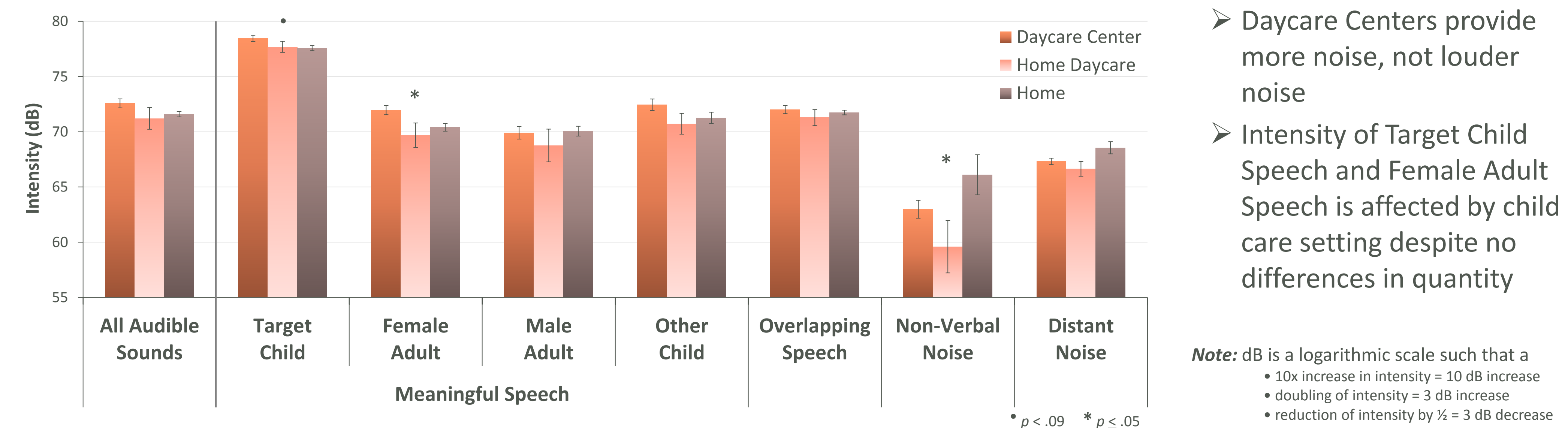
- Wrote script to interface with output from LENA
 - Extracted part of wav file based in information in associated table
 - Determined intensity and duration of clip/segment
 - Averaged intensity (summed duration) of segments over a recording
- For each participant
 - Averaged intensity of each segment across all recordings
 - Summed duration of each segment across all recordings and divided by total recording length

In what ways are daycare settings different from homes?

Distribution of Sounds Over a Day



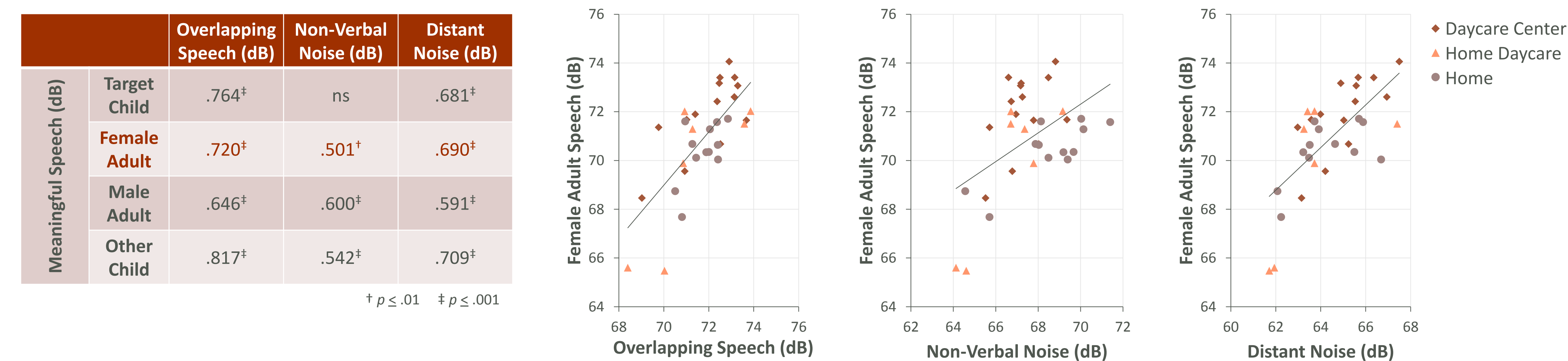
Mean Intensity of Audible Sounds



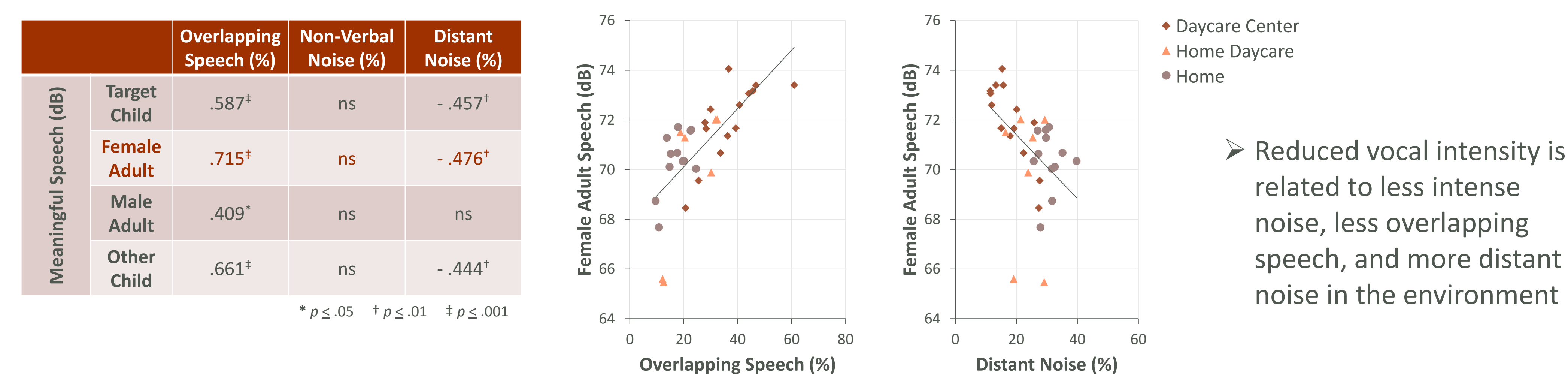
- Daycare Centers provide more noise, not louder noise
- Intensity of Target Child Speech and Female Adult Speech is affected by child care setting despite no differences in quantity

What does this mean for the clarity of speech?

Louder Speech is Associated with Louder Noise: an example of the Lombard reflex



Louder Speech is Associated with the Relative Amount of Noise



- Reduced vocal intensity is related to less intense noise, less overlapping speech, and more distant noise in the environment

Discussion

The Lombard reflex

- We reflexively speak louder to compensate for noise in the environment
 - e.g. people speak loudly when they are listening to music wearing headphones
- The amount of overlapping speech, but not the amount of non-verbal noise affects how loud we speak
 - The more we speak up, the more other people speak up as well
 - Inanimate objects don't respond to how loud we speak
- More distant noise means less near (loud) noise and a reduced need to speak in a loud voice

Conclusion

- Clear, effective communication occurs in all environments
- For clear, effective communication to occur in a Daycare Center speech must frequently be loud to compensate for noise levels in the environment, thus providing few opportunities to communicate in a typical "indoor voice"

Future Directions

- Immediately after noise stops we continue to produce speech according to the perceived (inaccurate) noise level
 - predict a positive relationship between the intensity of noise and the intensity of meaningful speech that follows it
- The type of noise affects how loud we speak
 - predict that the intensity of meaningful speech that follows overlapping speech will be louder than meaningful speech that follows non-verbal noise
- Disentangle distant speech from distant non-verbal noise
 - predict that the intensity of distant speech will affect the intensity of meaningful speech, whereas the intensity of distant non-verbal noise will not have an effect

References

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