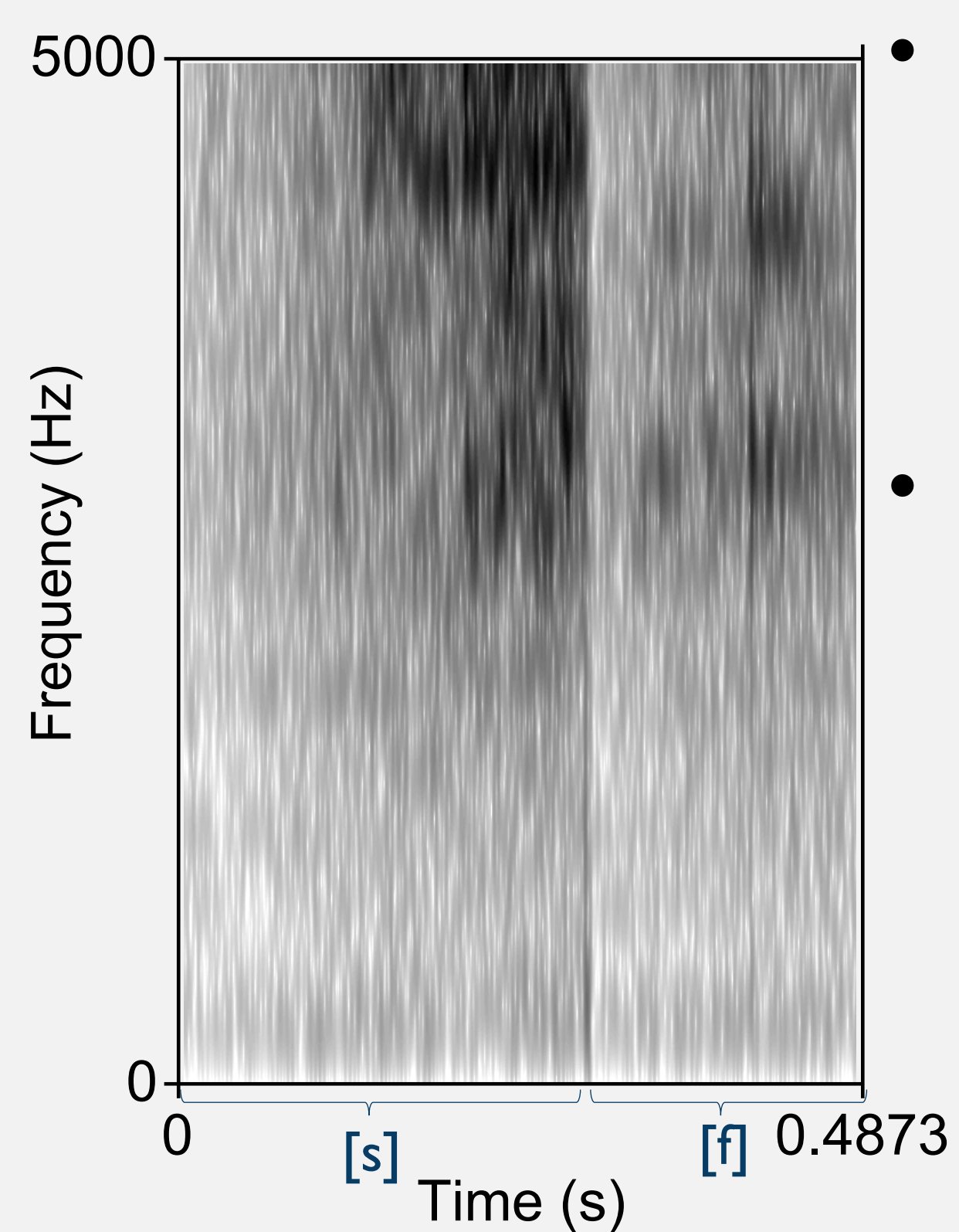


PERCEPTION AND PRODUCTION OF [S] IN HEARING IMPAIRED CHILDREN WITH COCHLEAR IMPLANTS

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Background

- Cochlear implants (CIs) provide access to sound for the hearing impaired (HI)
- High frequency information in [s] is not well recognized by the implant
- Even with a CI, HI children's ability to perceive high frequency sounds is reduced^[1]
- [s] can either be misheard as [f] for example, or not heard at all



- Shown on the spectrogram, [f] lacks the high energy of [s], and is less concentrated at higher frequencies
- Misperception means that HI children may have a different concept of what [s] sounds like as compared to typically hearing (TH) children who are able to perceive all of [s]'s acoustic information.

- To accurately produce a sound, it must be accurately perceived beforehand, thus HI children with CI's often have difficulty articulating a target-like [s]^[2]
- Different acoustic characteristics of male and female speech result from anatomical differences in the vocal tract^[3]
- TH children as young as three mimic this gendered information they perceive the adult speech signal for [s], demonstrating an early adherence to sociolinguistic norms^[4]

Research Questions

How does degraded perceptual information affect the sound category for [s] in hearing impaired children with cochlear implants as compared to typically hearing children? What is the effect of degraded perception on reproduction of sociolinguistic markers by children with cochlear implants that are produced in the typically developing population?

Methodology

Participants

- Three groups, all monolingual, English speaking:
- 10 HI children with CI's, 3-7 years old.
 - 10 TH children matched based on age.
 - 10 TH children matched based on receptive vocabulary size, 2-7 years old

Testing

- Control groups will be tested once.
- The experimental group will be tested twice over a period of six-months.
- Testing includes:
 - Parental interview
 - Peabody Picture Vocabulary Test^[5]
 - Experimental tasks – perception and production

Predicted Outcomes

Perception

1. HI children perform at chance or below chance and cannot discriminate the 'good' and 'poor' tokens
2. HI children perform above chance and are able to discriminate the 'good' and 'bad' tokens, but differ from the TH controls based on vocabulary size and not age.
3. HI children perform above chance and are able to discriminate the 'good' and 'bad' tokens, but differ from both control groups.

Production

1. The [s] sociolinguistic pattern will not be replicated in HI children's productions at all.
2. HI boys will match the sociolinguistic patterns of adult males, but HI girls will not match the sociolinguistic patterns of adult females.

What's Next

Testing begins in September 2017 and continues through into Winter semester of 2018. The results will be analyzed and written up as an honours undergraduate thesis.

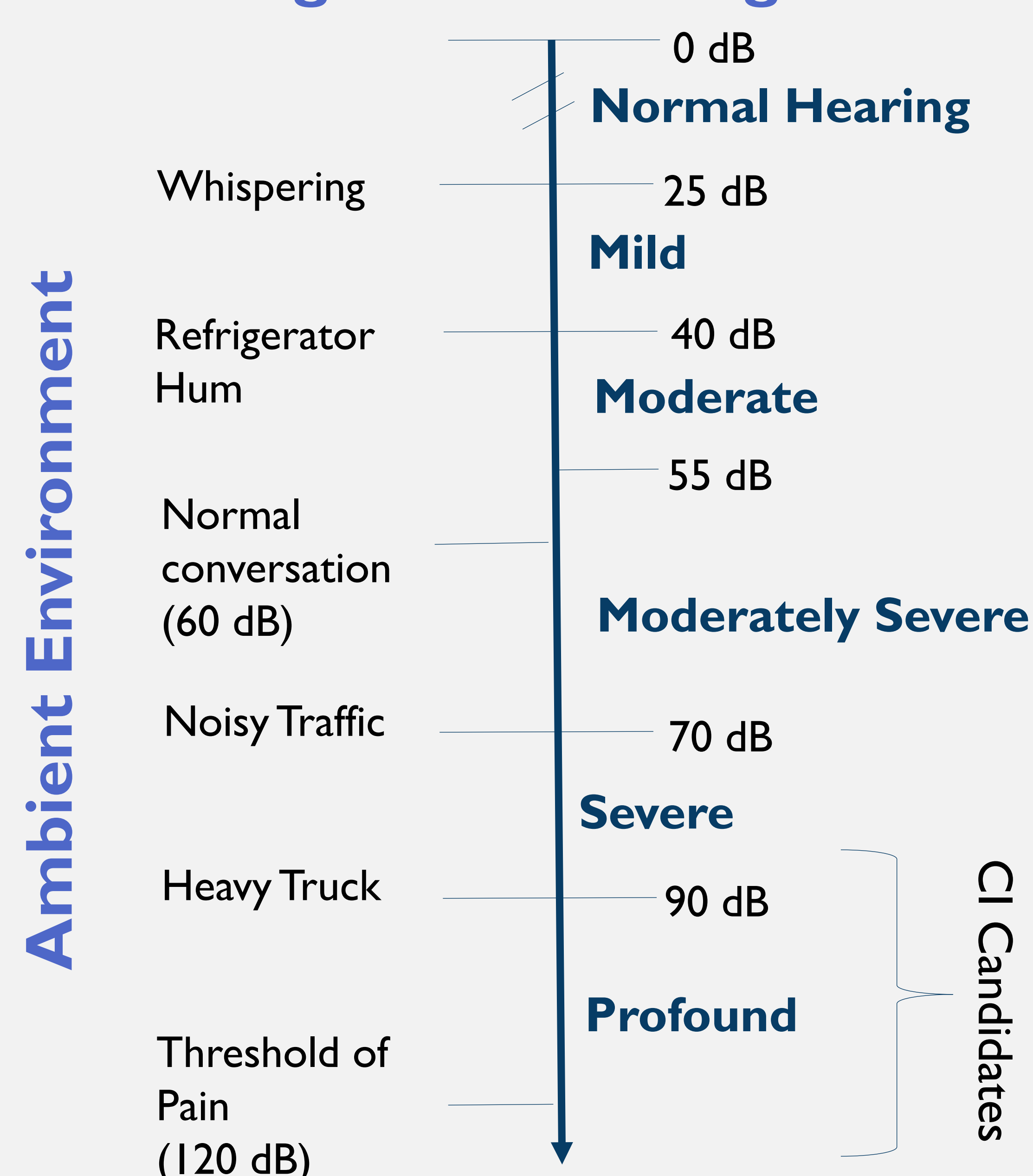
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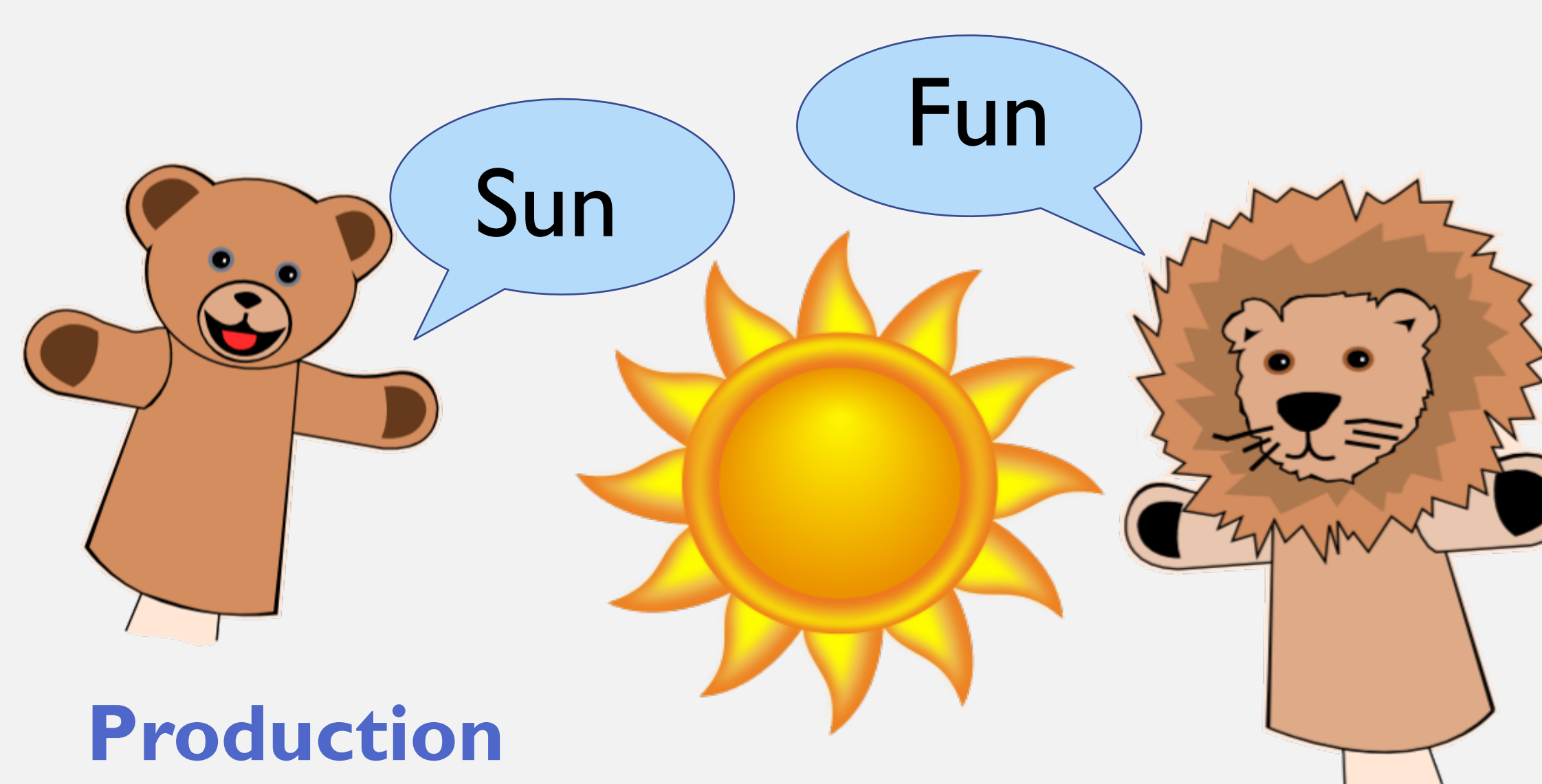
Degree of Hearing Loss



Task Design

Perception

- One of the puppets is "silly" and produces a poor [s] while naming a picture
- Participants will decide which puppet did the best job saying the word.
- Praat^[6] used to create the stimuli



Production

- Imitation task
- Same pictures as the perception task
- Participants will repeat each word