Audiometric Configurations in Children

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Method

- Groups
  - 6-year-old children
  - 60-year-old adults

- Audiogram Selection Criteria
  - Right ear thresholds only
  - Thresholds for each octave test frequency (250-8000 Hz)
  - At least one threshold $\geq$ 30 dB HL
  - Confirmed sensorinueral hearing loss by bone conduction audiometry
  - Air-bone gaps $\leq$ 10 dB
Method

• Core Set of Audiograms
  – 227 children
  – 248 adults

• Analyses
  – Configuration
  – Asymmetry
  – Progression
*Transducer Effects

![Graph showing hearing level vs. frequency for different transducers. The graph includes data points for Insert and TDH transducers. The x-axis represents frequency in Hz, ranging from 250 to 8000, while the y-axis represents hearing level in dB. The graph shows a general decrease in hearing level as frequency increases.](image-url)
*Transducer Effects*

TDH Series Earphone

↓

NBS 9A Coupler

↓

6cm³

Mic
*Transducer Effects*
All Audiograms

Adults (n=248)

Frequency (Hz)
250  500  1000 2000 4000 8000

Children (n=227)

Frequency (Hz)
250  500  1000 2000 4000 8000
All Audiograms

Adults (n=248)
Frequency (Hz)
250 500 1000 2000 4000 8000
Hearing Level (dB HL)

Children (n=227)
Frequency (Hz)
250 500 1000 2000 4000 8000
Hearing Level (dB HL)
All Audiograms

Adults (n=248)

Frequency (Hz)
250 500 1000 2000 4000 8000

Hearing Level (dB HL)

Children (n=227)

Frequency (Hz)
250 500 1000 2000 4000 8000

Hearing Level (dB HL)
All Audiograms

Adults (n=248)

Children (n=227)
All Audiograms

Adults (n=248)

Children (n=227)
Audiometric Classification

- **Sloping**
- **Rising**
- **Flat**
- **U-Shaped**
- **Tent-Shaped**
- **Other**
Results (Mean)

- **Hearing Level (dB)**
  - **Sloping**
  - **Rising**
  - **Flat**
  - **U-Shaped**
  - **Tent-Shaped**
  - **Other**

**Frequency (Hz)**
Results (Mean)

- Sloping
- Rising
- Flat
- U-Shaped
- Tent-Shaped
- Other

Hearing Level (dB) vs. Frequency (Hz)

- Adults
- Children
Results (Mean)

- **Sloping**
- **Rising**
- **Flat**
- **U-Shaped**
- **Tent-Shaped**
- **Other**

Hearing Level (dB) vs Frequency (Hz) for Adults and Children.
Results (Mean)

Sloping
Rising
Flat
U-Shaped
Tent-Shaped
Other
Results (SD)

Schoening

Frequency (Hz)

Hearing Level (dB)

Sloping

Rising

Flat

U-Shaped

Tent-Shaped

Other

Adults

Children

Results (SD)

+1SD
Results (SD)

- **Sloping**
- **Rising**
- **Flat**
- **U-Shaped**
- **Tent-Shaped**
- **Other**
Distribution of Configurations

Percent of Audiograms

Category

- Sloping
- U-Shaped
- Tent-Shaped
- Flat
- Other
- Rising

Adults
Children
*Sloping Losses*

- **Sloping**
- **Rising**
- **Flat**
- **U-Shaped**
- **Tent-Shaped**
- **Other**

Hearing Level (dB) vs Frequency (Hz) for Adults and Children.
*Sloping Losses

- Adults
- Children

Graph showing hearing level (dB) against frequency (Hz) for adults and children.
*Sloping Losses

[Sloping Losses Diagram]

- **Hearing Level (dB)** vs **Frequency (Hz)**
- **% OF AUDIOGRAMS**
  - Sloping
  - U-Shaped
  - Tent-Shaped
  - Flat
  - Other
  - Rising

- **Adults** and **Children**

- Graphs illustrate the hearing level across different frequencies and the percentage of audiograms for each type of hearing loss.
*Sloping Losses

**Adults**
- Sloping: 73%

**Children**
- Sloping: 33%

% of Audiograms
- Sloping
- U-Shaped
- Tent-Shaped
- Flat
- Other
- Rising

**Graph:**
- Pie charts for adults and children showing the percentage of sloping losses.
Asymmetry
Asymmetry

4000 Hz

Left-ear Threshold

Right-ear Threshold

Adults

Children
*Binaural Fitting Strategies*
Progression

Baseline Audiogram (6 yr-old)  Subsequent Audiogram

+5  +5  +10  +10  +20  +15
Progression

Age at Subsequent Audiogram (years)

Change in Threshold (dB)
Progression

Change in Threshold (dB)

Number of Thresholds
Summary

• Configuration
  – Children had a wider variety of audiometric configurations

• Asymmetry
  – More children had asymmetric losses and those asymmetries were more severe

• Progression/Fluctuation
  – Thresholds increased and decreased on subsequent audiograms
The End