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*
*Transducer Effects*

- TDH Series Earphone
- NBS 9A Coupler
- 6cm³ Mic
*Transducer Effects

Frequency (Hz)

Hearing Level (dB)

2cm³

ER 3A

250 500 1000 2000 4000 8000

-20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120

- Insert

- TDH
All Audiograms

Adults (n=248)

Children (n=227)
All Audiograms

**Adults (n=248)**

**Frequency (Hz)**

250  500  1000  2000  4000  8000

**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)

- Adults
- Children

- Frequency (Hz)
- Hearing Level (dB)

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

- Adults
- Children

Hearing Level (dB) vs. Frequency (Hz)

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

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

Hearing Level (dB) vs. Frequency (Hz)

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

- Adults
- Children
Results (SD)

- Adults
- Children

Frequency (Hz)

Hearing Level (dB)

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

±1SD
Results (SD)

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

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

**Frequency (Hz)**

Graphs show hearing level across different frequencies for different hearing patterns (Sloping, Rising, U-Shaped, Tent-Shaped, Other).
Results (SD)

- Adults
- Children

Frequency (Hz)

Hearing Level (dB)

Sloping

Rising

Flat

U-Shaped

Tent-Shaped

Other
Results (SD)

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

**Frequency (Hz)**

**Hearing Level (dB)**

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

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

Children

*Sloping Losses*

![Graphs showing hearing levels for adults and children with different hearing patterns.](image-url)
*Sloping Losses*

- **Adults**: 73%
  - Sloping: 48%
  - All Other: 25%

- **Children**: 33%
  - Sloping: 19%
  - All Other: 14%

% of Audigrams:
- Sloping
- U-Shaped
- Tent-Shaped
- Flat
- Other
- Rising
Asymmetry
Asymmetry

4000 Hz

Adults

Children

Left-ear Threshold

Right-ear Threshold
*Binaural Fitting Strategies*

![Graph showing binaural fitting strategies with frequency on the x-axis and hearing level in dB on the y-axis, with data points for left and right ears at various frequencies.]
Progression

Baseline Audiogram (6-yr-old) Subsequent Audiogram

Frequency (Hz)

Hearing Level (dB)

Baseline Audiogram

Subsequent Audiogram

†5 †5 †20 †10 †20 †15
Progression

Change in Threshold (dB)

Age at Subsequent Audiogram (years)
Progression
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