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Beneath the Surface: Listening Fatigue

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Disclosures

- Allison Cunningham
- Employed by Children's Hospital Colorado
 - Colorado EHDI Alliance member
 - VP, Board of Directors, CO Hands and Voices

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Outline

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What is Listening Fatigue?

2

Strategies for Listening Fatigue

3

Listening Fatigue and Trauma





What is Listening Fatigue?


- Focusing on listening can be mentally and physically exhausting
 - Leads to a decrease in ability to process sound
- Can occur even in quiet environments or after a short period of listening
- Listening in challenging situations requires individuals with hearing loss to allocate additional cognitive resources to auditory tasks in order to understand speech. (Davis, et. al., 2021)
- Needing to concentrate harder
 - Mentally & physically tiring
- Stress involved in trying to listen
 - Increases fatigue
- Not always visible "on the surface"
- Passive vs Active listening

Listening Fatigue Research

- There are actual changes in the brain:
 - Decreased input to the auditory cortex (as in deafness or hearing loss) taxes the brain, resulting in compensatory recruitment of frontal cortices for top-down modulation of sensory processing and cross-modal recruitment of auditory cortex by vision likely associated with a greater reliance on visual cues to help disambiguate the speech signal. (Glick & Sharma, 2017)
 - Increased activity in the Frontal cortex is an indicator of increased listening effort and cognitive load
- Noisy environments require more top-down processing to "fill in the gaps" (Dwyer, et. AL 2019)
- In DHH children, research has shown the following (Davis, et. al., 2021):
 - More mental effort when processing speech in noise
 - 2-3.5 times more likely to experience moderate to severe listening fatigue (Bess, et. al., 2020)
 - Exhibit greater signs of stress with elevated salivary cortisol levels in the early morning (Bess, et. al., 2016)

"Any type of degree, laterality or type of hearing loss can result in significant fatigue."

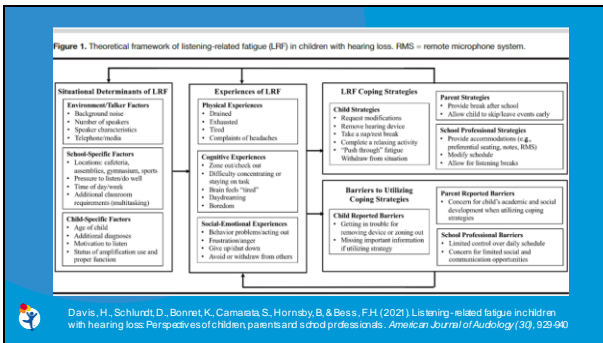
-Dr. Hilary Davis "EmpowEAR Audiology Podcast" February 2023



What does Listening Fatigue look/feel like?

Children:

- Sleeping more
- Emotional swings
- Sudden outbursts
- Removing hearing devices
- Preferring solo play
- Might appear shy
- Appear to be "not hearing"
- Inattentive
- WILD!



Why talk about listening fatigue?

2023 Journey Through Adolescence Workshops

- Parent workshops on listening fatigue
- Many parents had never heard of listening fatigue
- Parent comments included:

"This was very eye opening for me and the way parent my children."

"Valuable info that every parent needs to know as early as possible."


"The workshop gave words and information to our experience with our daughter. It helped me understand her better."

"Great information, first time I've heard about this (listening fatigue) and the suggested advocacy."

Vanderbilt Listening Fatigue Scales

- Pediatric and Adult scales available
- Pediatric scales
 - Child report
 - Parent report
 - Teacher report

<https://www.umc.org/vfs/vanderbilt-fatigue-scales>



VANDEBILT FATIGUE SCALE-CHILDREN (VFS-C)
 This scale is designed to assess listening fatigue in children aged 8-17 years.


Instructions: Read each sentence below and mark the response that best describes how you hear and how you feel most of the time.

CHILD NAME: _____ DATE: _____ GRADE: _____

	NEVER	SOMETIMES	OFTEN	ALWAYS	
I have to "tune out" at many meetings	0	1	2	3	4
I find it difficult to concentrate when lots of people are talking	0	1	2	3	4
I get bored and feel sleepy at school	0	1	2	3	4
I get tired and feel nervous at school	0	1	2	3	4
I have a lot of energy coming to school in class	0	1	2	3	4
I need things to do after a long time of listening	0	1	2	3	4
I get so tired from listening that I don't want to go to school	0	1	2	3	4
I feel bored and when I have to listen carefully	0	1	2	3	4


Strategies for Listening Fatigue: Young Children

- Listening breaks (structured vs unstructured)
- Leave a social/family event early
- Remote microphone
- Face to face communication
- Closed captioning
- Look at schedule for the day
- Advocacy
- Changes in parent voice, volume, rate, or speaking style
- Acoustic modifications
- Visual schedule
- Activities that regulate nervous system*
- Note:** Davis, et., al., 2021: parents reported the strategies and coping mechanisms used by their children with hearing loss were not employed by their siblings without hearing loss



Trauma Informed Lens to Listening Fatigue

- Activation of the Hypothalamic-Pituitary-Adrenal (HPA) Axis**
Overactivation in children: maladaptive behaviors, irritability, inattentiveness, lead to significant health outcomes as adults.
- Decreased window of tolerance- often stuck in a state of hypervigilance followed by periods of hypoarousal**
Early childhood experiences may impact perceived listening effort and impact of listening fatigue
- Listening fatigue is a result of nervous system dysregulation



Nervous System Regulation Activities

1

Heavy work: pulling wagon, throwing or pushing a heavy ball, laundry basket full of clothes, etc

2

Squeezing: Playdoh, wringing out wash cloth, stress balls, etc

3

Prioritize Vestibular/ Proprioceptive Activities: gymnastics, ninja gym, swimming, soccer, swinging, jumping on a trampoline, etc

4

Get outside, even better if in the company of animals

5

Oral activities: providing crunchy and chewy food options and using straw to eat/drink



Final Thoughts



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