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Beneath the Surface: Listening Fatigue

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Disclosures

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

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Outline

1

What is
Listening
Fatigue?

2

Strategies
for Listening
Fatigue

3

Listening
Fatigue and
Trauma





What is Listening Fatigue?

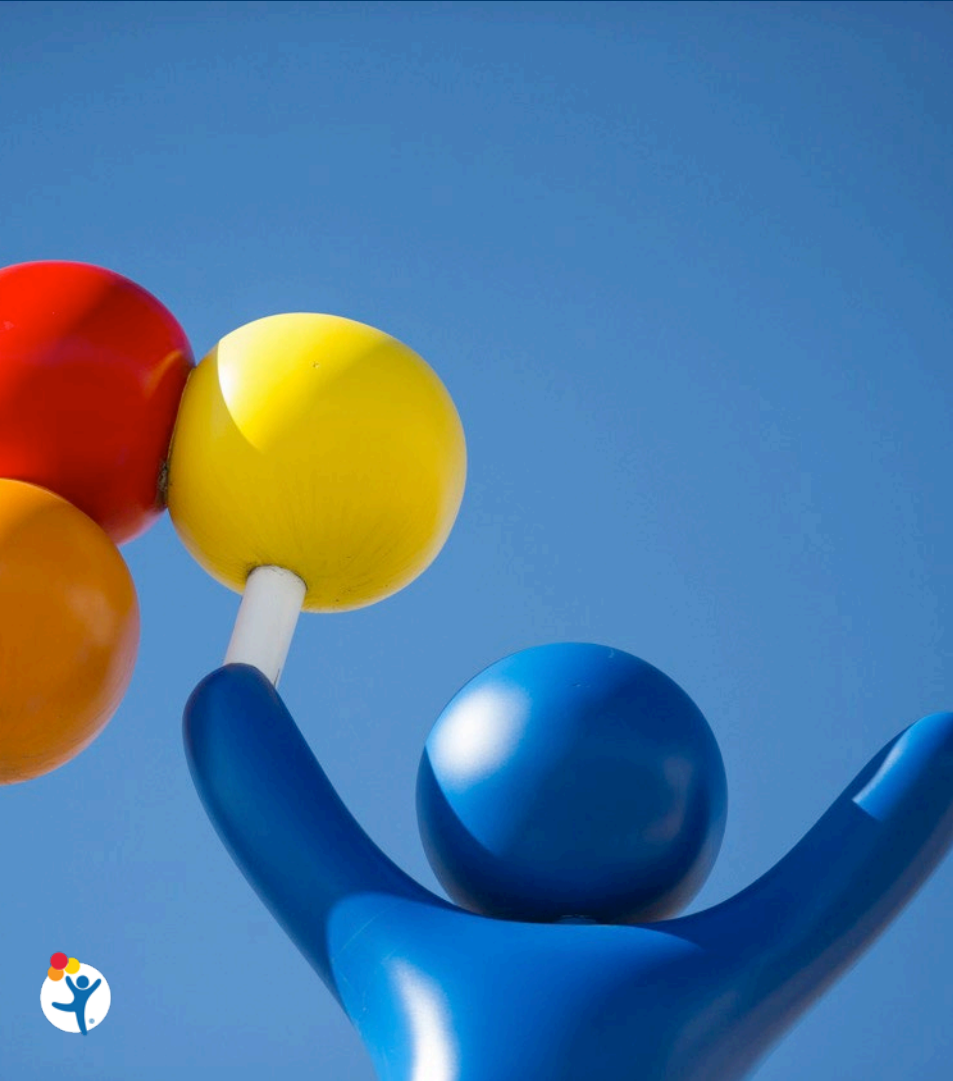
- Focusing on listening can be mentally and physically exhausting
 - Leads to a decrease in ability to process sound
- Can occur even in quiet environments or after a short period of listening
- Listening in challenging situations requires individuals with a hearing difference to allocate additional 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 - 2.5 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





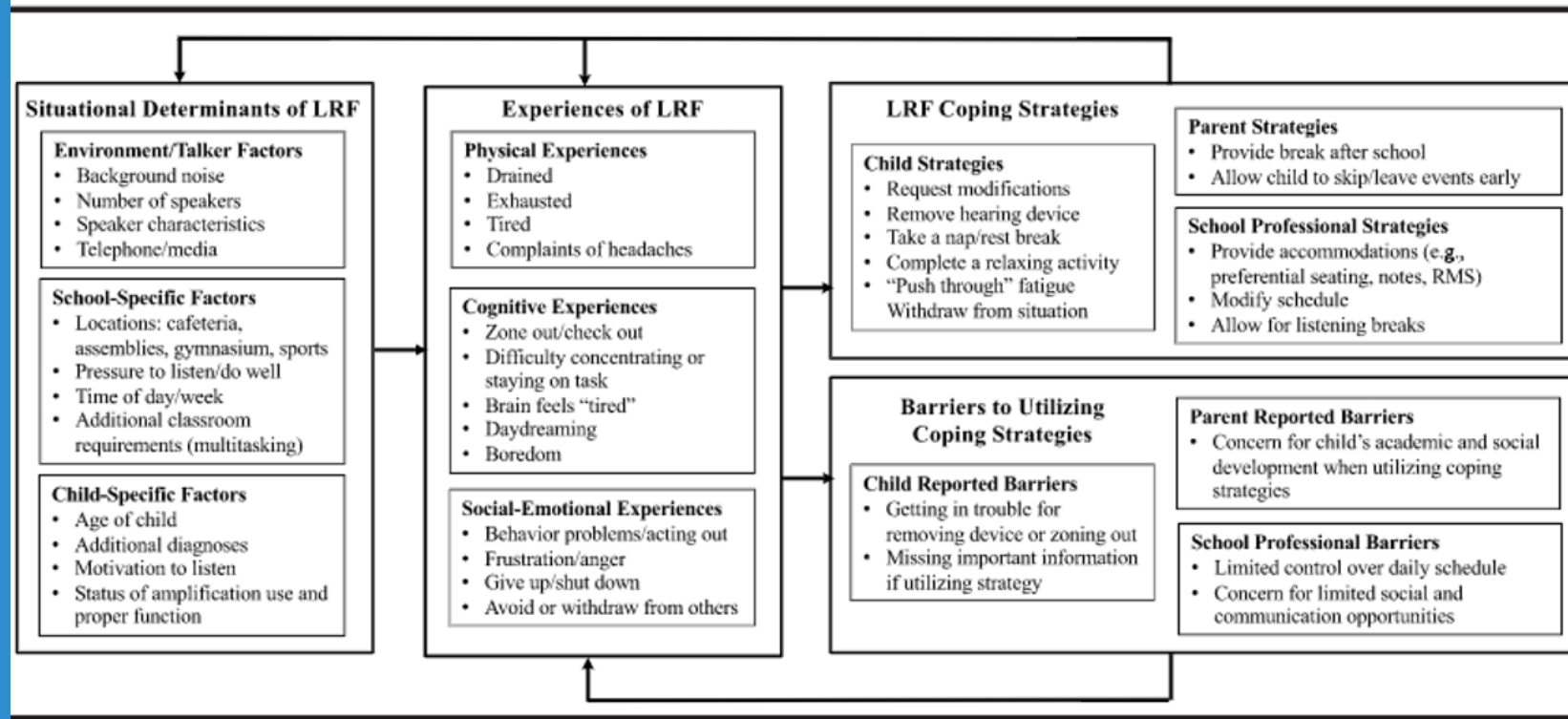
What does Listening Fatigue look/feel like?

Children:

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



Figure 1. Theoretical framework of listening-related fatigue (LRF) in children with hearing loss. RMS = remote microphone system.



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 I parent my children.”

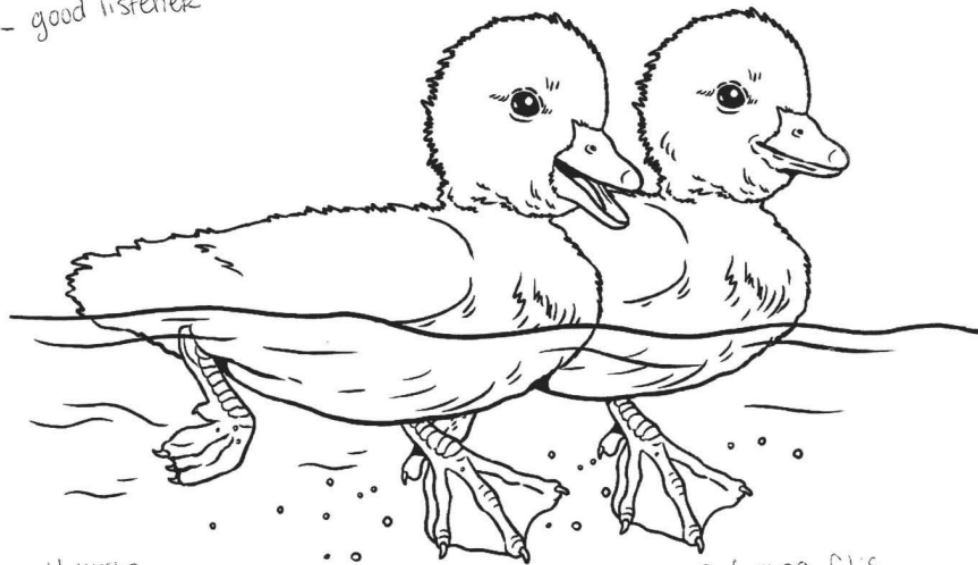
“Valuable info that every parent needs to know as early as possible.”

“Great information, first time I’ve heard about this (listening fatigue) and the suggested advocacy.”

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



- happy
- Silly
- good listener
- talkative
- loud and confident
- sweet
- Brave
- bossy/sassy



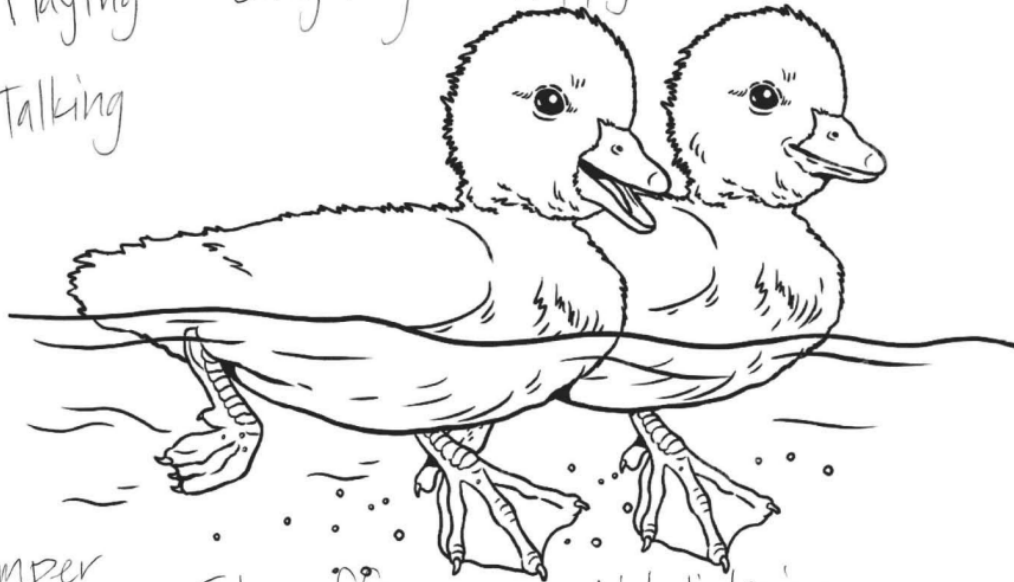
- outbursts
- whining
- headaches
- trouble communicating
- delayed ~~was~~ listening
- Refusing C.I's
- sleepy



Playing
Talking

Laughing

Happy



Temper
Tantrum

Takes off
CI and
won't put back on

Not listening
Playing by self



Vanderbilt Listening Fatigue Scales

- Pediatric and Adult scales available
- Pediatric scales (ages 6-17)
 - Child report
 - Parent report
 - Teacher report

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



VANDERBILT FATIGUE SCALE-CHILDREN (VFS-C)

This scale is designed to assess listening-related fatigue in children aged 6-17 years.

Instructions: Sometimes people feel tired from listening and trying to understand. We would like to know how you feel when you listen in different places. Please read each sentence and mark the SINGLE response that best describes how often you feel or act that way in a typical WEEK. Do not skip any questions.

CHILD NAME: _____ DATE: _____ GRADE: _____

	NEVER	RARELY	SOMETIMES	OFTEN	ALMOST ALWAYS
I want to "zone out" in very noisy places.	0	1	2	3	4
It is hard for me to concentrate when lots of people are talking.	0	1	2	3	4
My brain gets tired after listening all day.	0	1	2	3	4
I get worn out from listening at school.	0	1	2	3	4
Trying to listen at school stresses me out.	0	1	2	3	4
I use a lot of energy trying to listen in class.	0	1	2	3	4
I want to go to sleep after a long day of listening.	0	1	2	3	4
I give up trying to listen when I get tired.	0	1	2	3	4
I get so tired from listening that I don't want to do anything else.	0	1	2	3	4
I feel worn out 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
- 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 difference were not employed by their siblings without hearing difference



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

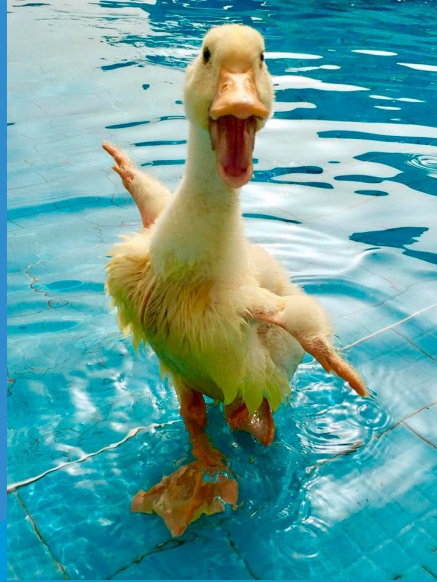
Get outside,
even better if in the company of animals

5

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



Final Thoughts



References

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Thank you!

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