Parent, Child and Teacher Subjective Reports of Listening-Related Fatigue in Children with Hearing Loss

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INTRODUCTION

It can be difficult for children with hearing loss (CHL) and others to quantify and describe the experience of fatigue. In addition to physical symptoms (e.g. sluggishness, sleepiness, etc.), anecdotal reports suggest that CHL also experience cognitive and/or emotional fatigue as a result of difficult listening. 1,2 The higher levels of mental effort exhibited by CHL may lead to a listeningrelated fatigue which, in turn, may have a negative impact on daily activities. Fatigue in children with other chronic conditions has been linked to school absences, reduced academic performance, sleep disturbances and negative changes in life quality. Although various pediatric fatigue scales exist, none, to our knowledge, include listening related items specific to hearing loss. This poster describes our ongoing work to develop such a measure for CHL.

PURPOSE

Overall study goal: construct sensitive, valid measures of listening-related fatigue in CHL that can be completed by the child, their parents, or teachers and used in clinics or schools.

Phase 1: A literature review and data from focus groups and interviews provided a framework for developing a multidimensional measure of listeningrelated fatigue for CHL. Focus group and interview data were used to create a pool of potential test items.

Phase 2 (data collection on-going): Participants are responding to pre-test questions which will be used to develop the final version of the Vanderbilt Fatigue Scale.

METHODS

- •PHASE 1: Focus group and interviews (See Table 1), led by a trained audiologist/ psychologist, and examined the following:
 - 1) characteristics of listening situations that may result in fatigue
- 2)behavioral manifestations of listening-related fatigue 3)coping strategies following the experience of fatigue
- 4)temporal characteristics of the fatigue development and coping
- •Focus groups/interviews were audio recorded and transcribed.
- Transcripts were coded to highlight recurrent themes and concerns. Coded materials were used to develop a Construct Map (Figure 1)
- describing domains (social emotional, cognitive and physical) and severity of listening-related fatigue in CHL
- Participant comments were used to develop over 90 test items to assess listening-related fatigue across all domains and severity levels.
- Potential items were iteratively reviewed for clarity and relevance by content experts (research team and lay individuals with and without hearing loss) and revised as needed resulting in a preliminary 60 item scale.
 - •~15 items/domain for each scale (Child, Parent, Teacher) targeting mild-severe listening-related fatigue.
- •PHASE 2: Data collected with the preliminary scale will be used to examine factor structure and identify high quality items.

Table 1: Participants as of 10/31/17

Group	Phase I	Phase II
Parent of CHL	17	149
Teacher of CHL (general, special, and deaf educator)	17	32
Service Provider (SLP, audiologist, interpreter)	11	
CHL (age 7-17)	41	71
TOTAL	86	252

FOCUS GROUP QUOTES AND SAMPLE ITEMS

School Provider Quotes:

"In the cafeteria, they try to listen but that's their starting time of "fading down" so they just kind of take it a break time. I've had my one student, she sometimes just takes her implant off and even turns the volume down on her hearing aid and that's like her time to just sit and not have to

Deaf education teacher

"But the fatigue, I think is a real killer on motivation! so they start feeling more and more down on themselves, or like this is just way too hard or I just can't

-General education teacher

feel like, if I'm doing a specific auditory task, I like to get the kids in the morning. At the end of the day, their ability to focus with their implants only becomes nearly impossible.

 Elementary school speech-language pathologist

Parent Quotes:

"She **struggles** with her last class period each day. Usually [it] has some type of video aspect in it, that's when she'll come home with more of a headache, she will admit, it's just too hard to drown out everything else and listen to the video."

–Parent of a middleschooler with bilateral cochlear implants

"Yesterday we took a field trip-explored a museum. The gentleman was great, but he spoke so fast—she was still **missing stuff**. In a hectic environment, really quick for her, I can tell her it's a lot for her. **She** has to make an effort, and it wears her out."

—Parent of a 10-year old with bilateral hearing loss

Child Quotes:

Younger child participants struggled to communicate their experiences with listening-related fatigue. It appears that the CHL is often unable to recognize that he or she does not understand all of what is being said and how much they are struggling to listen in difficult listening situations.



"Yeah, **you wanna give up**. You just don't want to try anymore because you know you won't actually get what they're trying to say or sometimes you think it's just you. Maybe I need to try a little harder to listen but when you do try, you **put all of** your focus on what they're trying to say and you still can't hear them."

-Teen with bilateral hearing aids

From quotes like these, items were developed by lab members as potential items for the Vanderbilt Fatigue Scale. Example items created

I get tired trying to keep up with group conversations.
I have to focus hard to understand group conversations.

I get tired trying to process and understand in a group conversation.

FATIGUE SCALE ITEMS

Figure 2: Example items created following focus groups and interviews for each participant group type.

My student stops participating in difficult listening situations.

TEACHER My student will give up trying to listen when it is difficult to

PARENT

- Trying to keep up in a conversation exhausts my child.
- My child gets frustrated when it is difficult to hear.

Almost

CHILD

- I use a lot of energy trying to understand what others are saying.
- I get annoyed when I have to listen in a noisy place.

NEXT STEPS: VFS-CHL PHASE 2

- Data collection for Phase 2 is on-going. Participants in each subgroup are completing the preliminary version of the scale.
- Once a large sample is collected for each group, statistical analyses will be completed to reduce the number of items to ensure the scale can be easily administered in clinics and schools.
- Please let us know if you would be willing to help with data collection by distributing the preliminary scale to potential participants by emailing: hilary.davis@vanderbilt.edu.

MULTI-DIMENSIONAL CONSTRUCT MAP

Literature review and participant comments guided development of a construct map consisting of relevant fatigue domains and behavioral indices of fatigue severity.

Fatigue

Moderate

Fatigue

Severe

Fatigue

Social- Emotional

Becomes irritated or anxious from

Social life is mildly impacted by

listening fatigue. May avoid and/or

listening difficulties/fatigue.

withdraw from certain social

Becomes stressed, sad and/or

Social life is moderately impacted

by listening fatigue. May avoid

Becomes extremely upset and/or

stressed by listening difficulties.

May exhibit aggression or tantrums.

listening fatigue. Isolates oneself to

Social life is severely impacted by

cope with listening fatigue.

certain social gatherings.

frustrated by listening

difficulties/fatigue.

gatherings

Domains of Listening-Related Fatigue

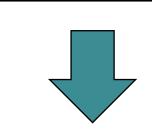


Figure 1: Multi dimensional construct map

Physical



Cognitive

Some difficulty following fast-paced

- conversations. Some difficulty remaining attentive. Does not often tune/zone out
- Must apply substantial mental effort to overcome difficulties remaining attentive when listening and following conversations.
- May tune/zone out and need prompting.

 Becomes unwilling/unable to maintain effort and attention when completing even routine mental

activities. Often 'shuts down' or consciously decides to disengage.

- May exhibit mild tiredness after listening.
- Would enjoy a short rest or a listening break (not a requirement). Rarely gets headaches from listening
- Feels tired after listening. May take listening breaks to recover.
- May get headaches from listening. May show abnormal sleep
- habits/patterns.
- May turn down hearing device.
- Feels exhausted from listening.
- Regular breaks need to be scheduled into school day.
- Significant sleep problems. Significant headache problems. Reports need to remove hearing

CLINICAL RECOMMENDATIONS

- •CHL are at increased risk for listening related fatigue and may exhibit negative consequences.
- •Validated intervention studies have not yet been undertaken, but you can discuss listening-related fatigue with your patients and their families. Encourage them to look out for:
 - Tiredness
 - Sleepiness in the morning
 - Inattentiveness and distractibility
 - Mood changes
- Probe further than a simple query: "Are you tired?". The observable behaviors associated with listening-related fatigue may not be captured by this question.
- Talk with teachers and parents about the importance of accommodations, such as taking listening breaks.
- See our website for additional information on listening-related fatigue in CHL: https://my.vanderbilt.edu/listeninglearninglab/

REFERENCES

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