



## Dually Diagnosed: An Interdisciplinary Approach to Autism and Hearing Loss



Amy Szarkowski, PhD  
Susan Wiley, MD



LEND AuD Workshop  
May 2023

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Who is REALLY an expert in ASD + DHH?



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Perhaps by sharing perspectives,  
we can all understand a bit better

Psychologist

Developmental Behavioral Pediatrician

Deaf individual with Autism

Audiologists

*together*

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## Topics for Today's Talk

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Arriving at a "dual diagnosis"

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"Red flags" - recognizing ASD in DHH children

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Learning from a person with lived experience

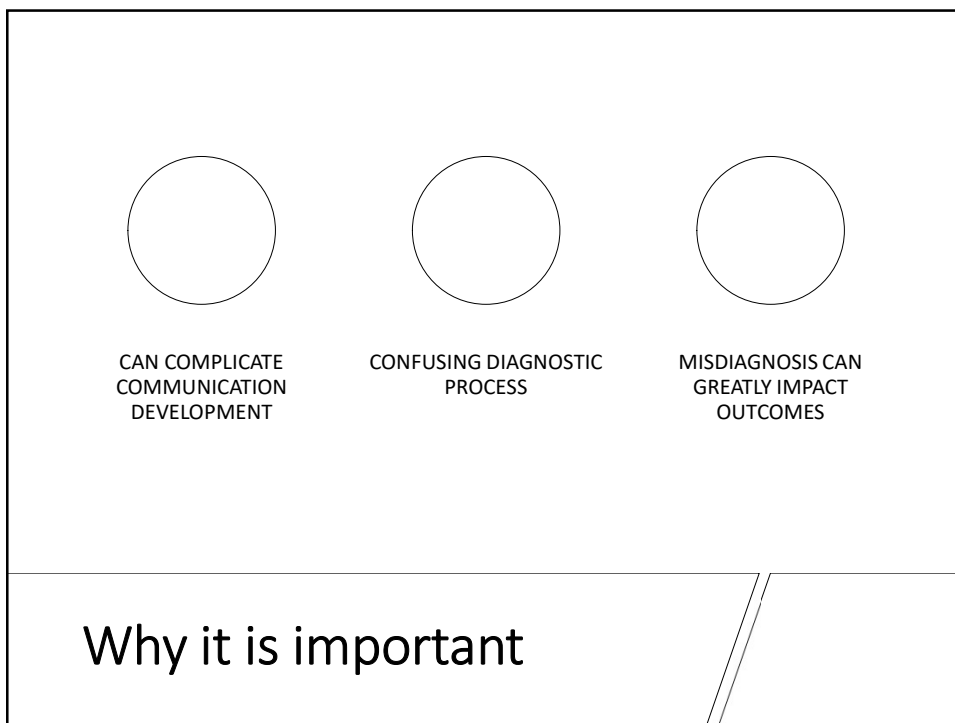
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Implications for Audiologists

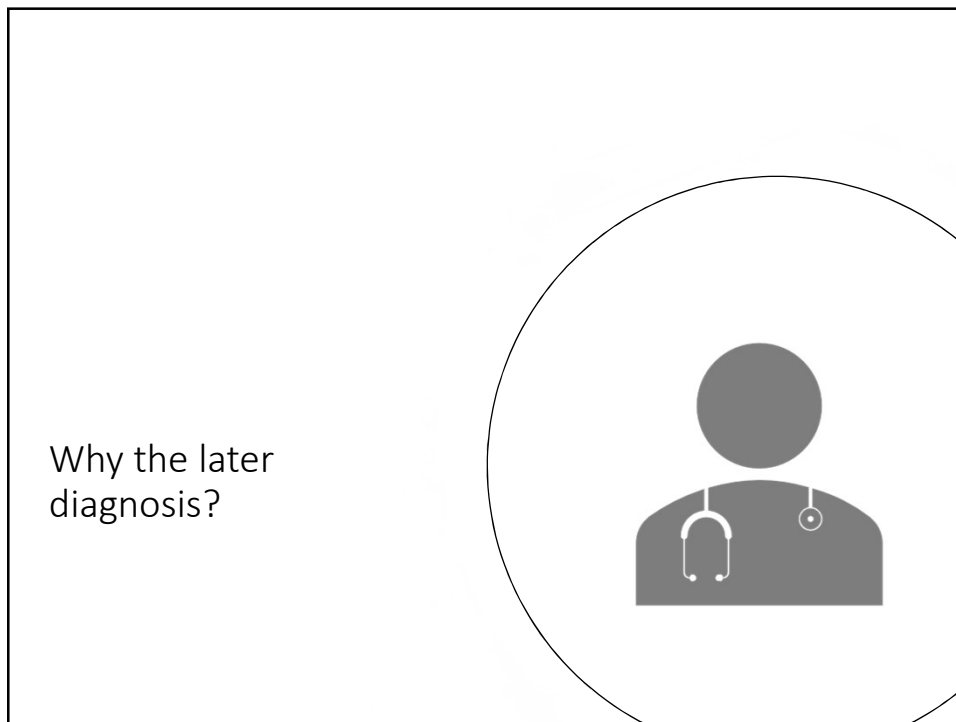
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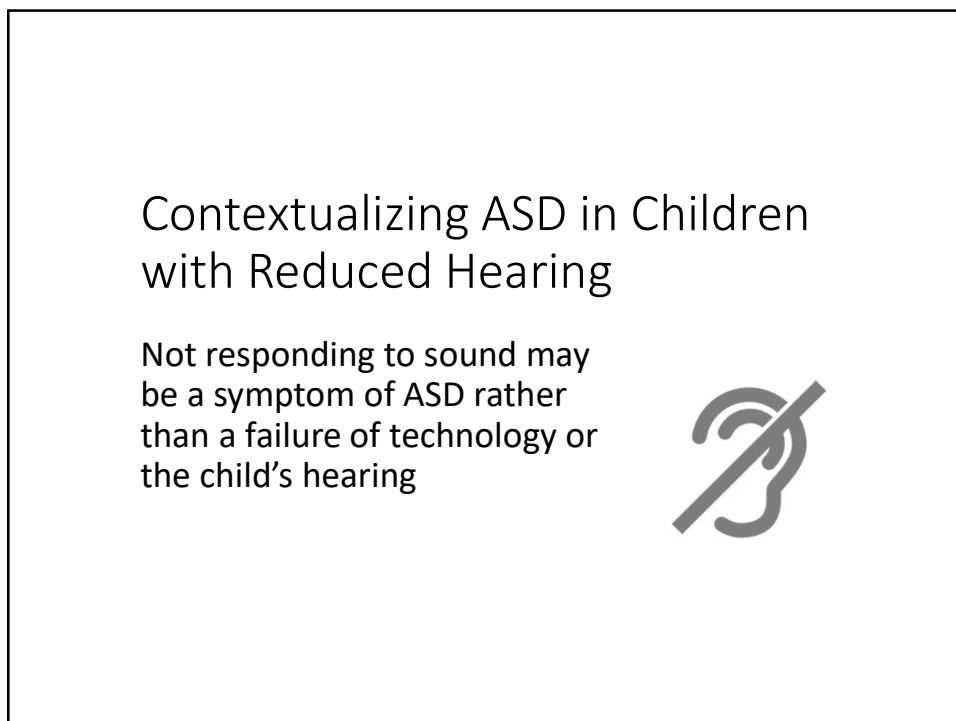
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## Confirmatory Diagnosis of ASD in DHH Occurs at Older Ages

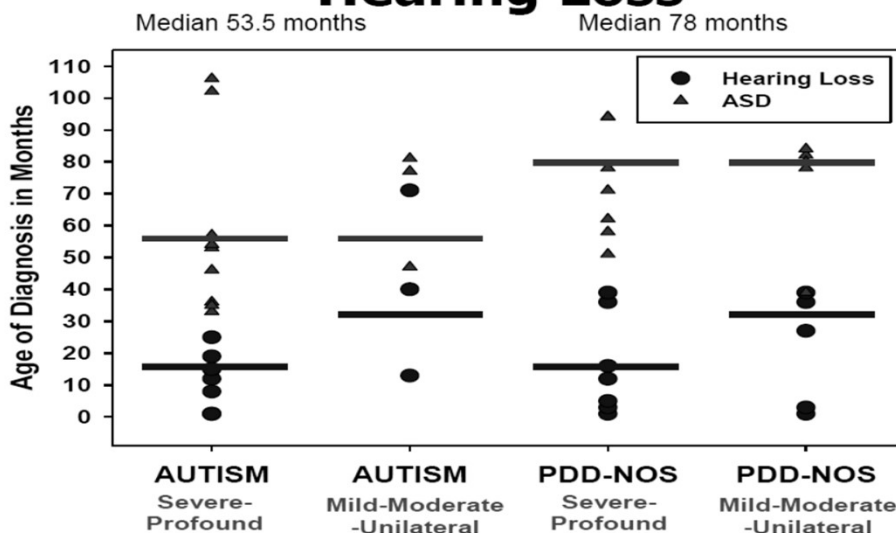
**Table 2 Age of Diagnosis of Autism Spectrum Disorder in Children Who are Deaf and Hard of Hearing**

	Age			
	Range	Mean (y)	Median (y)	Mode (y)
Initial or provisional diagnosis	16 mo -18 y	4.5	3.6	3.6
Subsequent or confirmatory diagnosis	22 mo -18 y	6.35	5	5.6

Szarkowski, Flynn & Clark (2014) – Dually Diagnosed, retrospective study

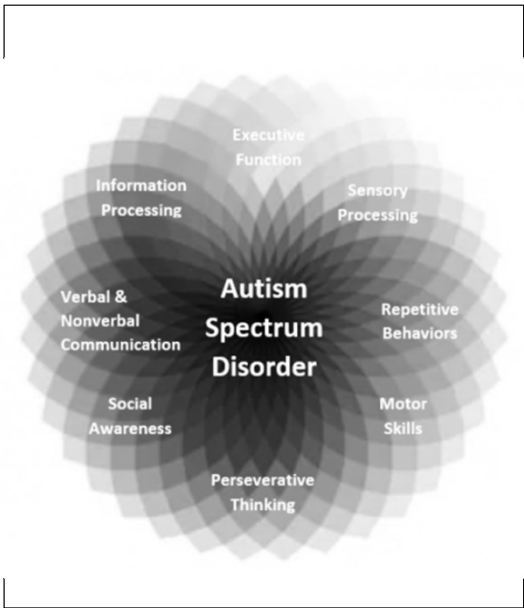
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## Age of Diagnosis for ASD and Hearing Loss



Meinzen-Derr, J et al "Autism Spectrum Disorders in Children who are Deaf or Hard of Hearing" International Journal of Pediatric Otorhinolaryngology 2014 Jan;78(1):112-8

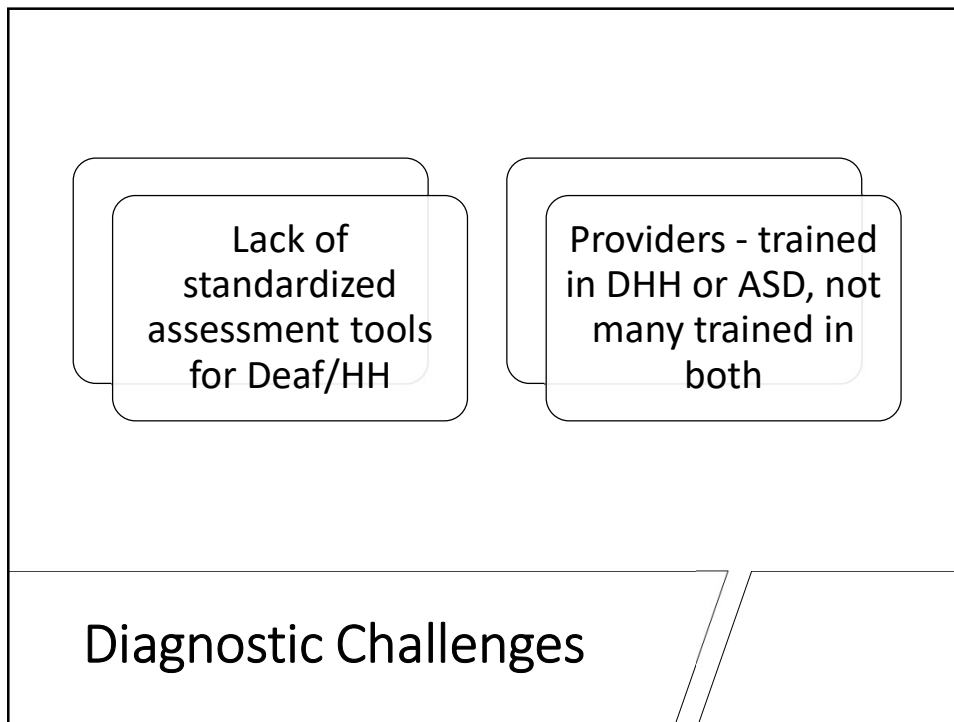
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<p>Imagine for a moment</p> <ul style="list-style-type: none"> <li>• Testing for ASD – no gesture allowed</li> <li>• Child is not responding to their name – why?</li> <li>• Eye contact with a Deaf child</li> <li>• Other health concerns (etiologies of reduced hearing)</li> </ul>	 <p>The diagram is a circular, multi-layered graphic with 'Autism Spectrum Disorder' at the center. Surrounding the center are several components: Executive Function, Sensory Processing, Repetitive Behaviors, Motor Skills, Perseverative Thinking, Social Awareness, Verbal &amp; Nonverbal Communication, and Information Processing.</p>
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<p>Understanding DHH &amp; ASD</p>	<hr/> <p>Higher ASD Rates in DHH children (or maybe not...)</p> <hr/> <p>Severity of DHH &amp; ASD dx = Mixed results</p> <hr/> <p>DHH children are later to be diagnosed (esp. mild HL)</p> <hr/> <p>Delayed dx → delayed intervention → poorer outcomes</p> <hr/> <p>ASD + DHH → complicates language development</p>
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Susan Wiley



Cincinnati Children's™

Deborah Mood



Children's Hospital Colorado

Christine Yoshinaga-Itano



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A Summary of Current Understanding  
Regarding Children with Autism Spectrum  
Disorder Who Are Deaf or Hard of Hearing

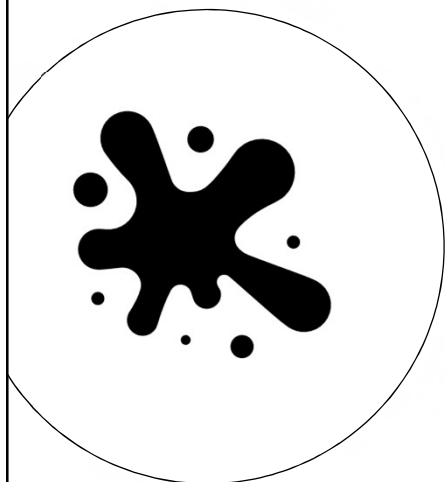
**Amy Szarkowski, Ph.D.,<sup>1,4</sup> Deborah Mood, Ph.D.,<sup>2</sup> Aaron Shield, Ph.D.,<sup>3</sup>  
Susan Wiley, M.D.,<sup>5</sup> and Christine Yoshinaga-Itano, Ph.D.<sup>6</sup>**

Seminars in Speech and Language. 2014; 35(4):241-259.

What We Know (& lots that we don't)

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Atypical Preverbal  
Communication

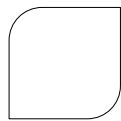


- Reduced eye contact
- Lack of pointing
- Poor orientation for communication
- Reduced joint attention

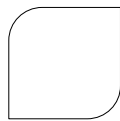
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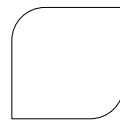
## Looking Out for Language



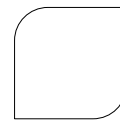
DIFFERENCES



DELAYS



INSUFFICIENT EARLY  
LANGUAGE ACCESS



"LANGUAGE  
DEPRIVATION"

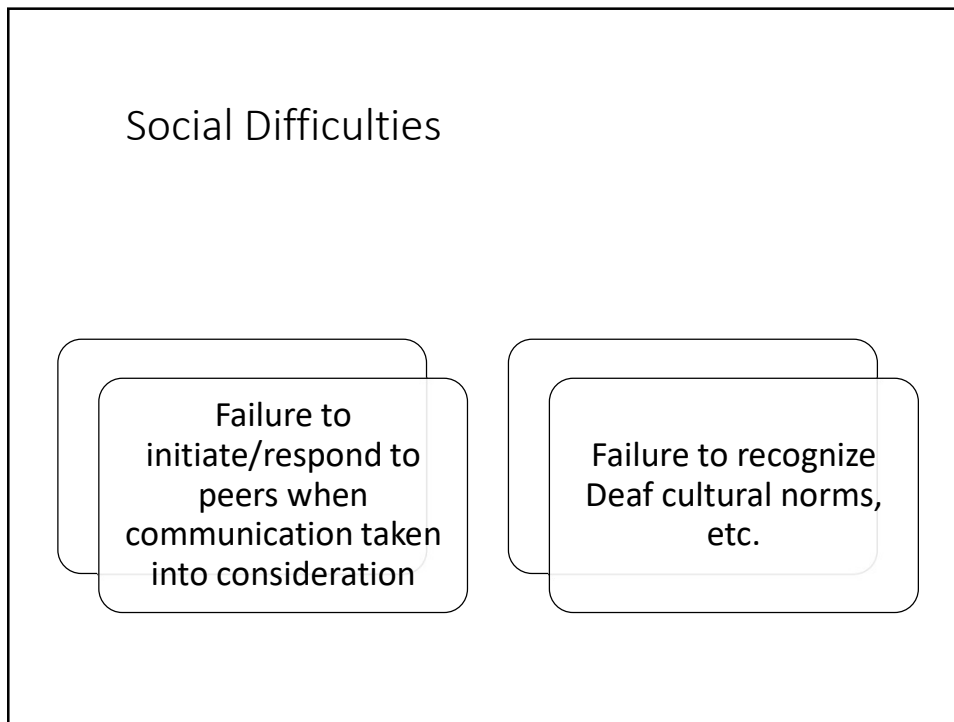
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## Language features of ASD in ASL

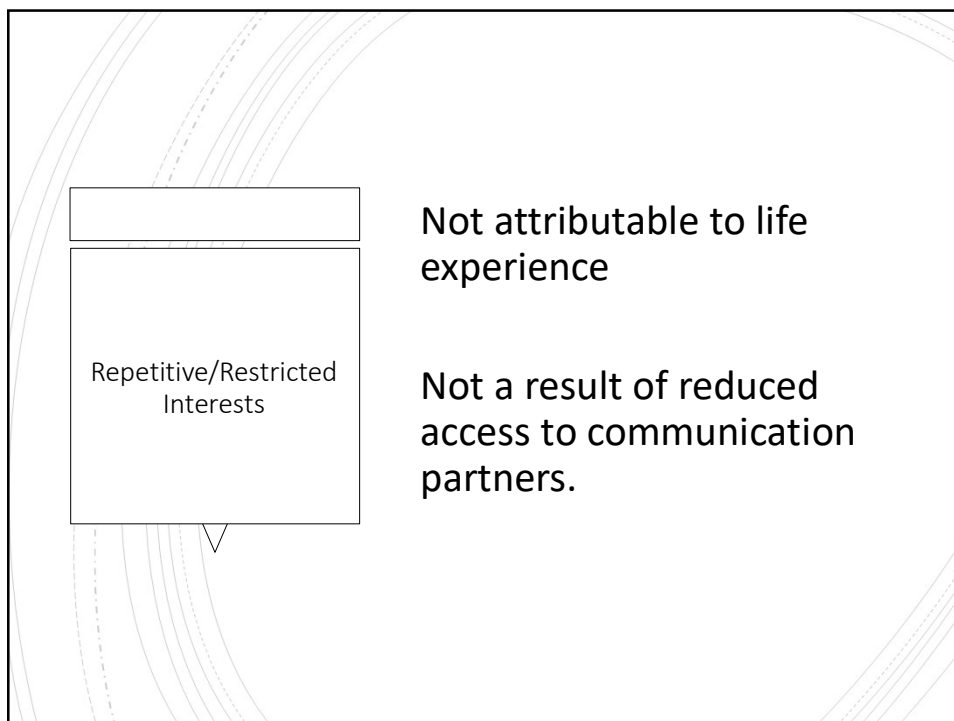
Features similar to oral language but may present differently in visual language

- Palm reversals
- Pronoun avoidance vs. pronoun reversal
- Echolalia
- Persistent use of individual's own gestures rather than formally instructed/used sign vs. neologisms (e.g. "red" vs. "ketchup")
- Failure to use appropriate sign space
- Mixed results regarding use of facial aspects of sign language and impact of ASD

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## Red Flags

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## Differentiating ASD, DHH & ASD + DHH

Delving deeper to understand the “symptoms” and the presentation

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## Deficits in Social Reciprocity

ASD	Typical DHH	ASD & DHH
Atypical social approach	Approp. Social smile & eye contact	Reduced/absent social smile; limited eye contact
Difficulties with reciprocal conversations	Give/show, gesture, vocalize; approp. Joint attention	Limited give/show behaviors; reduced joint attention; difficulty engaging at their language level
Reduced sharing of affect /interests/ enjoyment and limitations in social interaction	Imitates motor/vocal output &/or signs	Reduced sharing of affect; difficulty comprehending facial/signed emotion cues
		Not respond to name or culturally approp. attention-getting
		Difficulty understanding others' needs, feelings

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## Communication Challenges

ASD	Typical DHH	ASD & DHH
Poorly integrated verbal/nonverbal behavior	Well integrated gestures/eye contact/vocalizations	Poorly integrated sign and spoken language (if utilizing total communication)
Limited facial expressions/gestures	Wide range of facial expressions; use of ASL facial grammatical markers	Limited gestures, lack of pointing; Limited range or poorly coordinate facial expression
Poor understanding of nonverbal cues	Will learn incidentally with visual/auditory access, the sequence of learning language will follow typical developmental norms	Poor understanding/use of integrated ASL facial grammatical features
		Limited spontaneous language use of words within child's repertoire for social

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## Social Relationships

ASD	Typical DHH	ASD & DHH
Difficulties building relationships appropriate to developmental level	Interested in people and able to develop age-appropriate relationships when communication is accessible	Reduced shared enjoyment; Difficulty making and sustaining friendships even when communication is accessible
Difficulty with imaginative play	Imaginative play follows typical developmental course (commensurate with language and nonverbal IQ)	Delayed symbolic play skills, inconsistent with nonverbal IQ; play -unimaginative & rigid
Difficulty making friends or limited interest in people	May prefer to control conversation or play if having troubles following changes in conversation based on language level or in challenging listening environments	Unusual social overtures toward others (e.g. backing into parents, grunting at peers, hitting peers to initiate contact)

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## Stereotyped/Repetitive Movements

ASD	Typical DHH	ASD & DHH
Stereotyped repetitive speech (repetitive language, idiosyncratic phrases)	Usually typical; esp. with well-established communication system and ave nonverbal IQ	Idiosyncratic gestures (e.g. persistent use of made up gesture, distinct from home sign, when formal sign taught/used)
Echolalia	Echolalia can occur as a typical developmental pattern, but should be for a brief period of time	Echolalia in sign or spoken language
Repetitive use of objects	Use of objects linked to communication & vocabulary	Highly repetitive play with objects

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## Rigid & Repetitive Behaviors

ASD	Typical DHH	ASD & DHH
Excessive resistance to change	<p>If communication is solid &amp; child understands, will often change routines</p> <p>Resistance issues can be present – perhaps due to comprehension issues</p>	Significant upset when routines are disrupted
Excessive resistance to change	May struggle with transitions if language level doesn't yet support understanding first-then concept	Resistant to change, transitions are difficult (these difficulties are beyond that anticipated by language level)

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## Restricted Interests

ASD	Typical DHH	ASD & DHH
Preoccupation with a particular object or topic	<p>Usually not demonstrated or very brief; able to move to new toys, objects</p> <p>Interest can be shaped by lived experience</p>	Repeated play with toy or object (often with unintended purpose)

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## Sensitivity

ASD	Typical DHH	ASD & DHH
Unusual sensory interests (visual inspection, smelling objects), fascination with lights/spinning objects	May have some atypical sensory responses	May show sensitivity to wearing amplification  May show limited response to amplification (seem to be more deaf than you would expect based on their audiogram or amplified responses)
Indifference or oversensitivity to pain/heat/cold	Hyper- and hypo-sensitivities  More typically differences with vestibular functioning	Hypo and hyper-sensitivities

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## Other Diagnostic Considerations

<u>Learning/Communication:</u>	<u>Behavioral Conditions</u>	<u>Medical Condition</u>
<ul style="list-style-type: none"> <li>• Intellectual Disability</li> <li>• Communication Disorders</li> </ul>	<ul style="list-style-type: none"> <li>• ADHD</li> <li>• Anxiety disorder</li> <li>• Obsessive compulsive disorder</li> <li>• Sensory integration difficulties</li> </ul>	<ul style="list-style-type: none"> <li>• Tourette’s Syndrome</li> <li>• Epilepsy</li> <li>• Landau-Kleffner and other epileptiform language disorders(rare)</li> <li>• Peripheral vision cuts</li> <li>• Benign stereotypies</li> </ul>

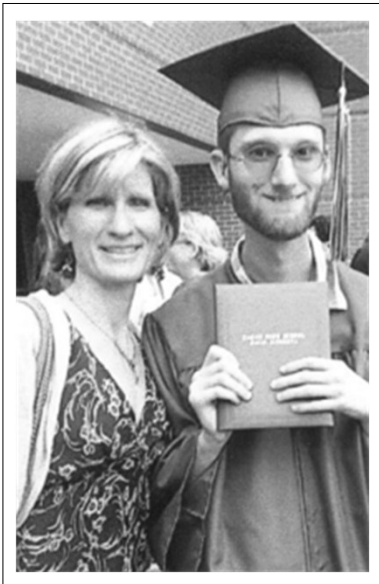
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<p>Communication considerations</p>	<hr/> <p>Multifaceted approach to language is warranted</p>
	<hr/> <p>Language must be accessible to children who are D/HH</p>
	<hr/> <p>Child's means of accessing language (receptive language) may differ from most reliable means of using language (expressive language)</p>
	<hr/> <p>Targeting core symptoms of ASD (e.g., responsiveness to CI → may be ASD, not failure of CI; problems with ASL → poor motor in ASD)</p>

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Learning from Luke

...and his mom, Candace



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Considerations for Supports

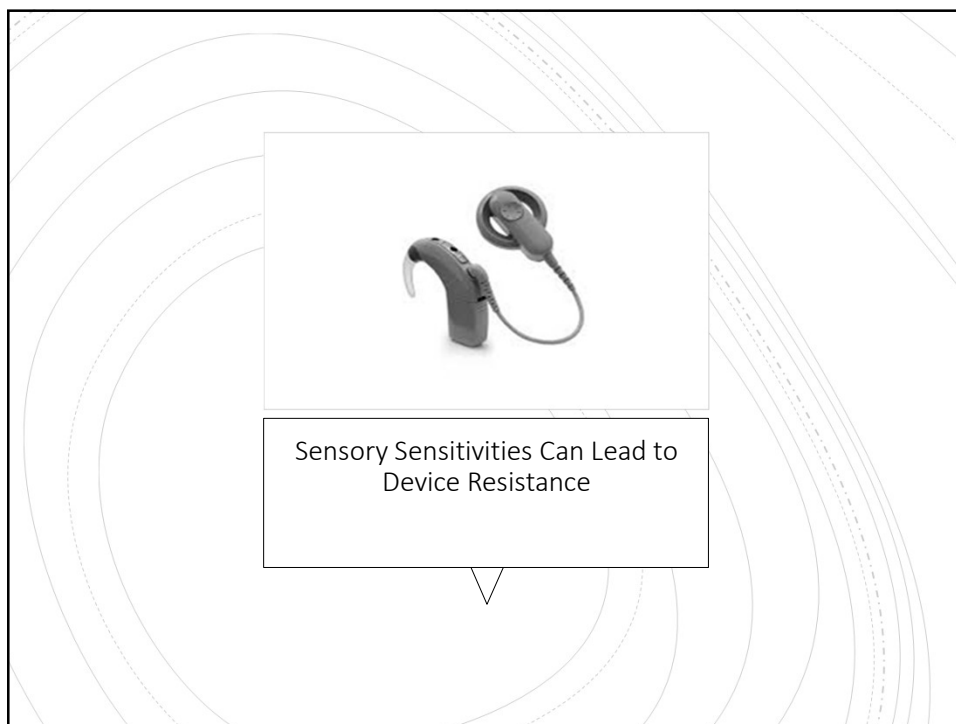
A black and white icon depicting three stylized human figures (two in the back, one in the front) with a speech bubble above them containing three horizontal lines, all enclosed within a large, thin-lined circle.

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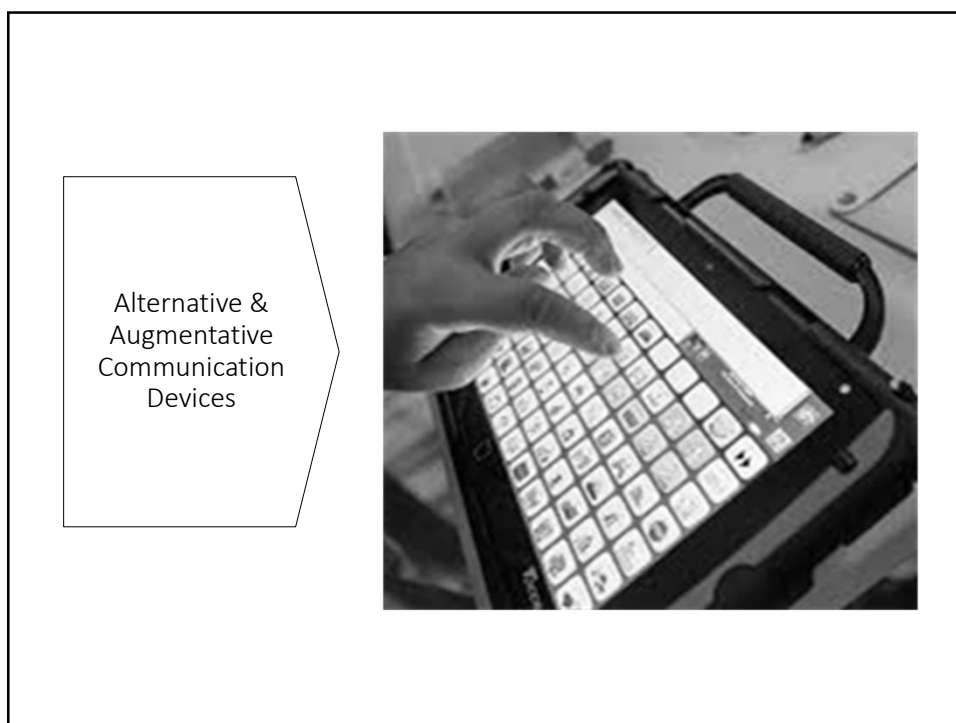
Language Considerations  
Features of ASD may impact language acquisition

- Joint attention deficits
- Reduced eye contact
- Motor imitation


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## ASD & DHH or DHH & ASD: Prioritizing 'diagnoses'

- Child's needs
- Rules & regulations for placement/services
- Communication access
- Open heartedness of professionals

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## Hearing Loss in Children with ASD

*Pediatrics & Child Health*, 2022, 27, 176–182  
<https://doi.org/10.1093/pch/piab097>  
 Advance Access publication 21 March 2022  
 Original Article

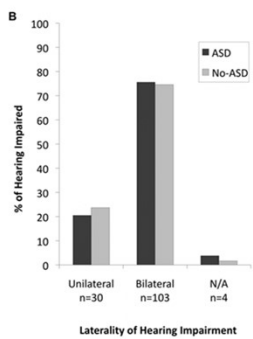


### Appraising the need for audiological assessment before autism spectrum disorder referral

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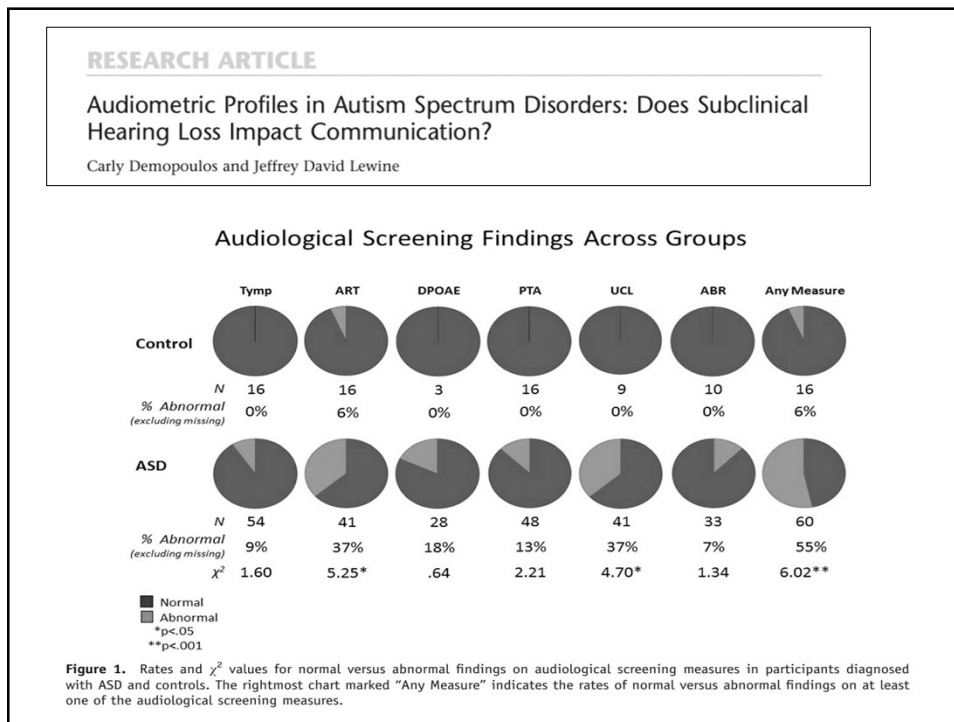
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 \*These authors contributed equally as co-first authors.



Laterality	ASD (%)	No-ASD (%)
Unilateral (n=30)	~20	~25
Bilateral (n=103)	~75	~75
N/A (n=4)	~5	~5

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**AJA**

**Clinical Focus**

**Using Visual Supports to Facilitate Audiological Testing for Children With Autism Spectrum Disorder**

Haley M. McTee,<sup>a</sup> Deborah Mood,<sup>b</sup> Tammy Fredrickson,<sup>a</sup> Amy Thrasher,<sup>a</sup> and Angela Yarnell Bonino<sup>a</sup>

<https://osf.io/b23ux/>

- Audiology Video Models and Visual Schedules
- OSF Storage (United States)
- + 1. English Hearing Test Tools
- + 2. Spanish Hearing Test Tools
- + 3. Recommended Scripts to Use
- + 4. Website Instructions to Give to Patients
- + Creative Commons License
- + Wiki images

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## Sound Sensitivity in ASD

Hyperacusis

“Loud noises feel like a dentist’s drill hitting a nerve.”

Phonophobia – fear of sounds

Misophonia – learned, emotional reaction to sound

Stiegler & Davis, 2010

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## What People with ASD Want Audiologists to Know

- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>• Info in advance</li><li>• How IRL will differ from prep materials</li><li>• Tactile defensiveness</li><li>• Knowledge “in the moment” depends...</li></ul> | <ul style="list-style-type: none"><li>• Be aware of uneven language development (e.g., verbally expressive, difficulty with instructions)</li><li>• Escape routes</li><li>• Favorite topics – wrap up</li></ul> |
|--|---|

Cloppert & Williams, 2005

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