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Intervention considerations for deaf children with autism spectrum disorder: Part 2 Strategies

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Children's Hospital Colorado
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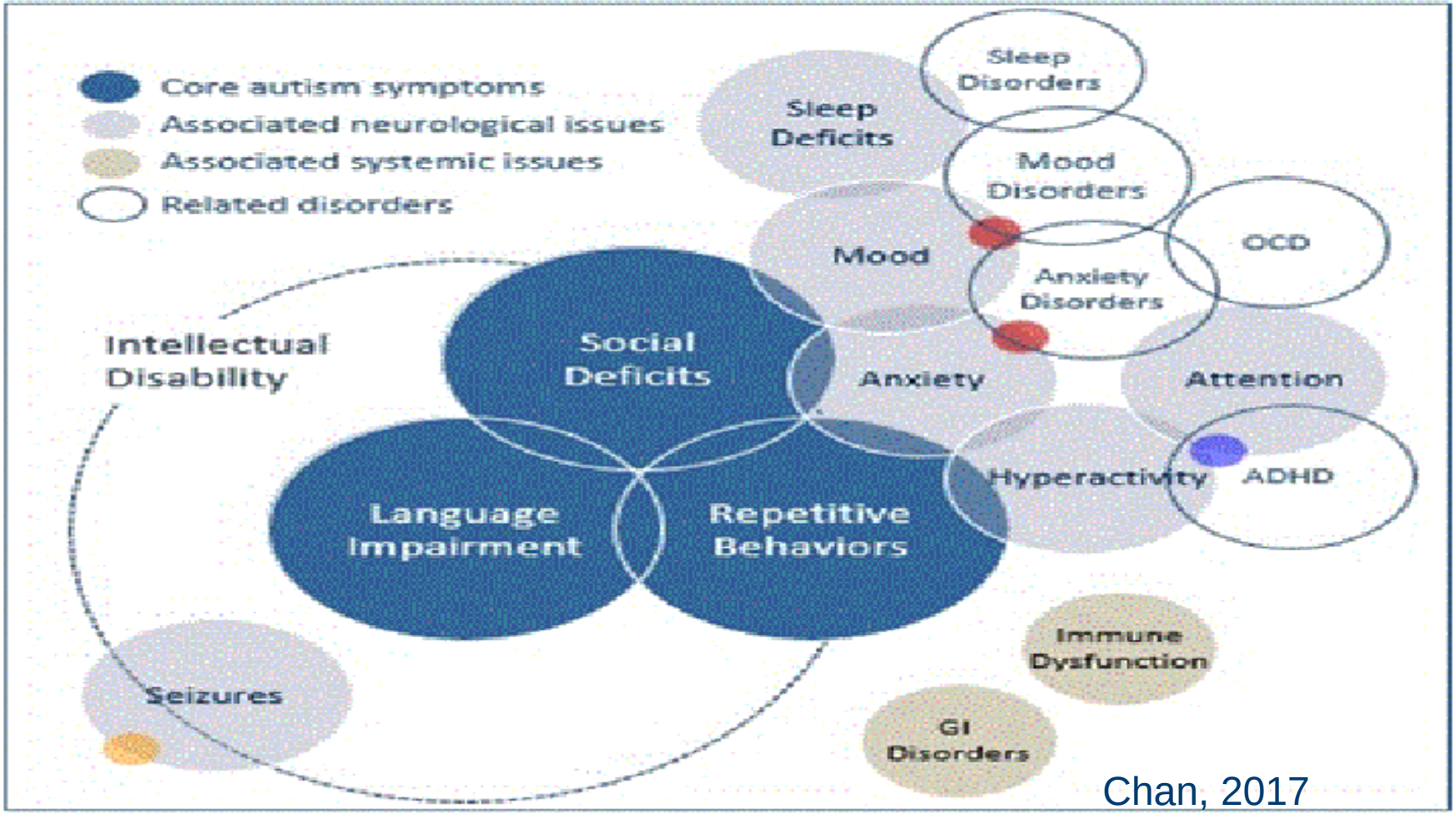
Objectives

1. Identify at least two interventions for treating core symptoms of an autism spectrum disorder and associated concerns

2. Describe at least two ASD intervention strategies which could be applicable in their own professional setting.

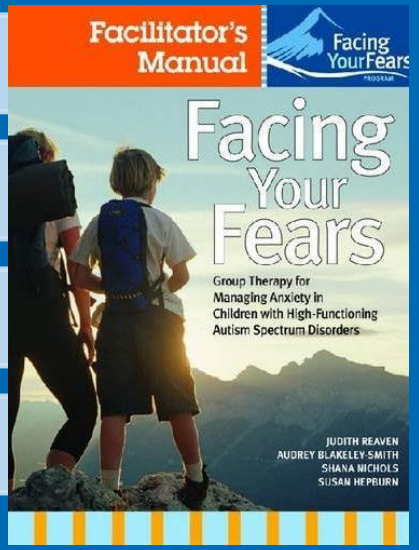
3. List at least one consideration for modifying ASD intervention with children with reduced hearing.

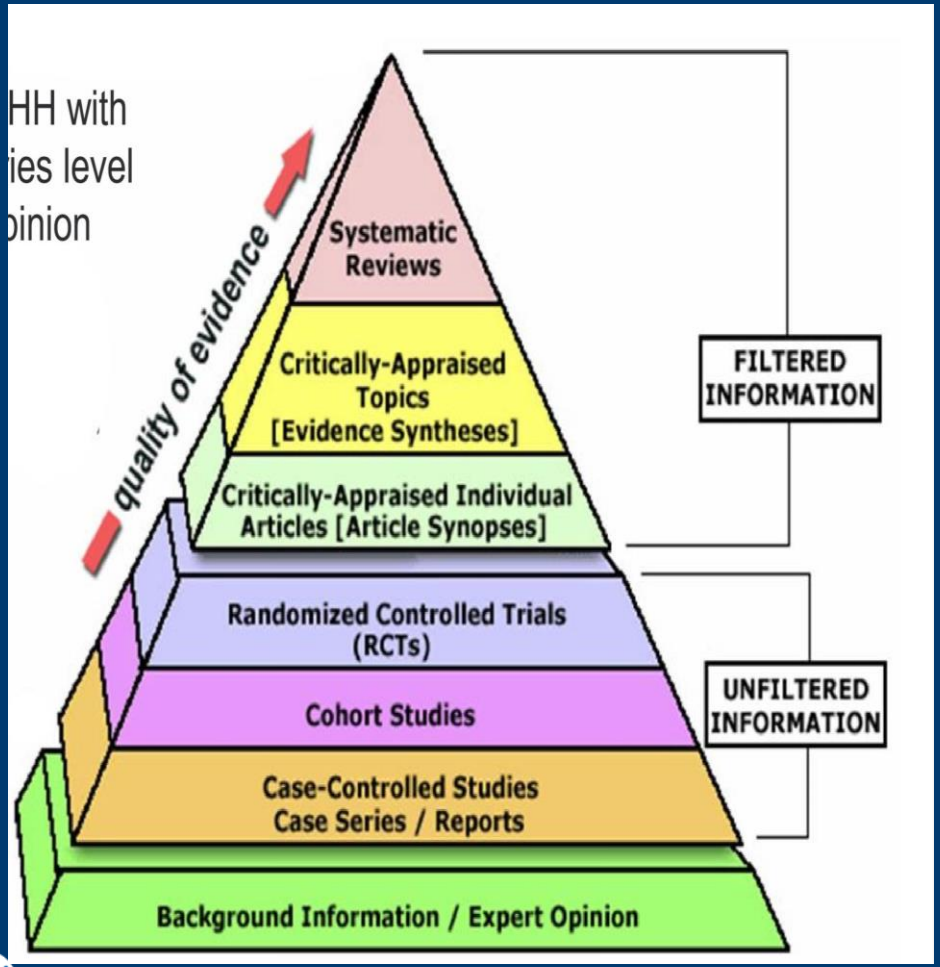

Core autism symptoms
Associated neurological issues
Associated systemic issues
Related disorders
Sleep Disorders
Sleep Deficits
Mood Disorders
Mood
OCD
Anxiety Disorders
Intellectual Disability
Social Deficits
Anxiety
Attention
Hyperactivity
ADHD
Language Impairment
Repetitive Behaviors
Immune Dysfunction
Seizures
GI Disorders

Chan, 2017

Treating Core and Associated Symptoms

Medical Intervention	• seizures • sleep concerns • GI issues
Psychiatry/Mental Health	• anxiety/depression • ADHD • OCD
Educational Intervention	• placement considerations • environmental accommodations
Speech/Language	• pragmatics • AAC
Occupational Therapy	• self-regulation • sensory • motor planning
ABA/Behavioral	• Social • Communication • Self-injurious/dangerous behavior • Adaptive skills





Behavioral interventions work

- No effective medications yet
- Many models work
- Most involve a combination of structured teaching and naturalistic intervention
- Little research about use of interventions with DHH

Evidence Based Programs

National Professional Development Center on ASD
http://autismpdc.fpg.unc.edu/

National Autism Center National Standards
https://www.nationalautismcenter.org/national-standards-project/

Autism Speaks
https://www.autismspeaks.org/science/resources-programs/autism-treatment-network

Evidence Based Practices with DHH

Easterbrooks S and Handley CM Behavior Change in A Student with a Dual Diagnosis of Deafness and Pervasive Developmental Disorder: **A Case Study**. American Annuals of the Deaf 2005-2006. 150, 401-407.

Malandraki GA and Okalidou A The Application of PECS in a Deaf Child With Autism: **A Case Study**. Focus on Autism and other developmental disabilities, 2007: 22(1), 23-32.

Malandraki GA and Okalidou A The Application of PECS in a Deaf Child With Autism: **A Case Study**. Focus on Autism and other developmental disabilities, 2007: 22(1), 23-32.

Evidence Based Practice with DHH

Video modeling **framework** suggested for children with dual diagnosis of deafness or hard of hearing and autism spectrum disorder to promote peer interaction. Semin Speech Lang. 2014 Nov;35(4):331-42 **Theoretical Paper**

Webster-Stratton Parenting Program

Garcia, R and Turk J "The Applicability of Webster-Stratton Parenting Programmes to Deaf Children with Emotional and Behavioural Problems, and Autism, and Their Families: Annotation and Case Report of a Child with Autistic Spectrum Disorder" Clinical Child Psychology and Psychiatry 2007 (12) 125-136. **A Pilot Study, n of 1**

Teacher's perspectives on evidence-based practice

- Surveyed Teachers of the Deaf
- 55% with area of expertise beyond D/HH, 45% D/HH only
- Varying levels of awareness of Established treatments for ASD (20-100% of the EBP's known)

Table 1. EBP addressed across National Standards Report category of established treatments

Established treatment	Intervention included in study
Antecedent package	Environmental enrichment
	Special interests
	Choice
	Prompting/cueing
	Stimulus familiarity
	Errorless learning
Behavioral package	Contingency contracts
	Contingency mapping
	Token economies
	Discrete trial training
	Shaping
	Task analysis
	Functional communication training
	Behavioral toilet training
	Generalization training
Comprehensive behavioral treatment for young children*	
Joint attention	Joint attention
Modeling	Live modeling
	Video modeling
Naturalistic teaching strategies	Incidental teaching
Peer training package	Peer buddies
	Peer initiation training
Pivotal response training	Pivotal response training
Schedules	Schedules
Self-management	Self-management
Story-based intervention package	Social stories

Note. EBP = evidence-based practices.
*This was not addressed as it is typically not performed by the classroom teacher in a classroom setting.

- Among TOD with experience teaching children with ASD, rated effectiveness of EBP's for D/HH students with ASD

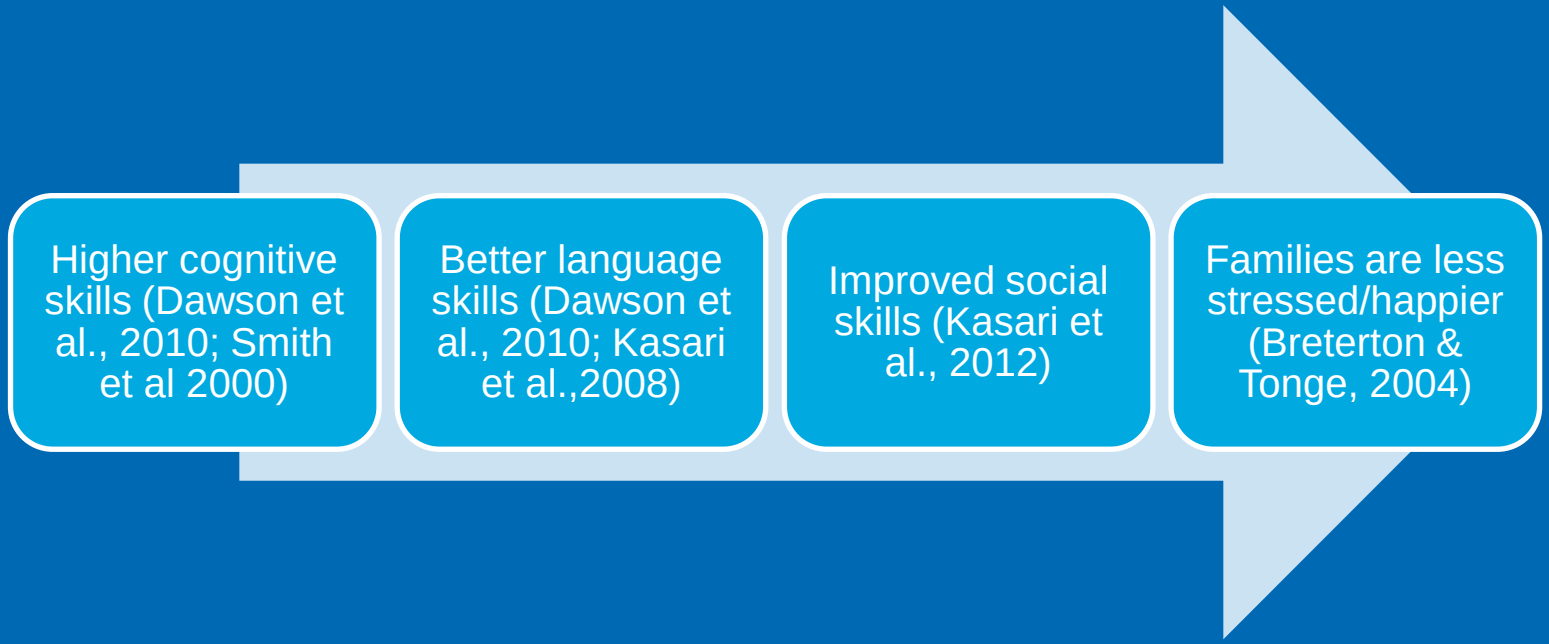
- **Varying opinions** on **effectiveness**

- >80% of TOD are **using EBP** they are **familiar with** (prompting/cueing, live modeling, schedules)

- **Familiarity** does **not** equate to **implementation**
  - 16 EPB were used by <50% of TOD who had familiarity with the practice

Borders CM, Jones Bock S, Szymanski C. Teacher ratings of evidence-based practices from the field of autism. *Deaf Studies and Deaf Education,* 2015, 91-100

Intervention Outcomes



Interventions require intensity

Involve high dose (20+ hours per week)

Structure

Highly trained professionals

Can change course of core deficits in social communication

Still not sure who benefits most from current interventions

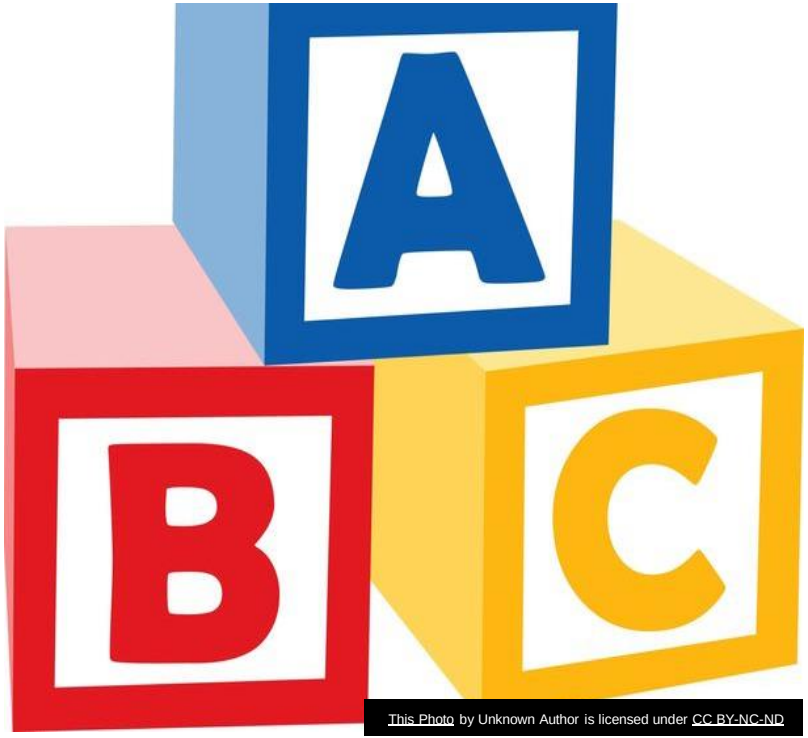
- 1/3 kids receiving ABA still minimally verbal entering K

Interventions for Young Children

Applied Behavioral Analysis	Relationship Focused Early Intervention Models	Developmental Models	Parent training models	Models specifically for preschool-age children
• Discrete trial • Pivotal response training • Incidental teaching models • Skinner's applied verbal behavior	• Floor Time (DIR)-Greenspan and Wieder • Relationship Development Intervention (RDI) • ESDM	• Early Start Denver Model (ESDM)	• Hanen More than Words	• LEAP • Early Start Denver Model

What is ABA?

- Theory of learning based on principles of behaviorism
  - Applied =makes meaningful changes
  - Addresses observable (& measurable) behaviors
  - Analytical= procedures implemented result in the behavioral change
  - Assumes behaviors are learned through conditioning
    - Classical conditioning
    - Operant conditioning
  - Emphasizes clearly defining procedures so can be carried out by any one working with the child



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For whom is ABA appropriate

- Ages: early childhood to adults
- Often used with children with developmental disabilities (e.g., ASD, intellectual disabilities): Principles can be applied to all children
- Often used in management of severe, persistent, challenging behaviors
- Appropriate to teach new skills to children who have difficulty learning incidentally/through traditional teaching methods

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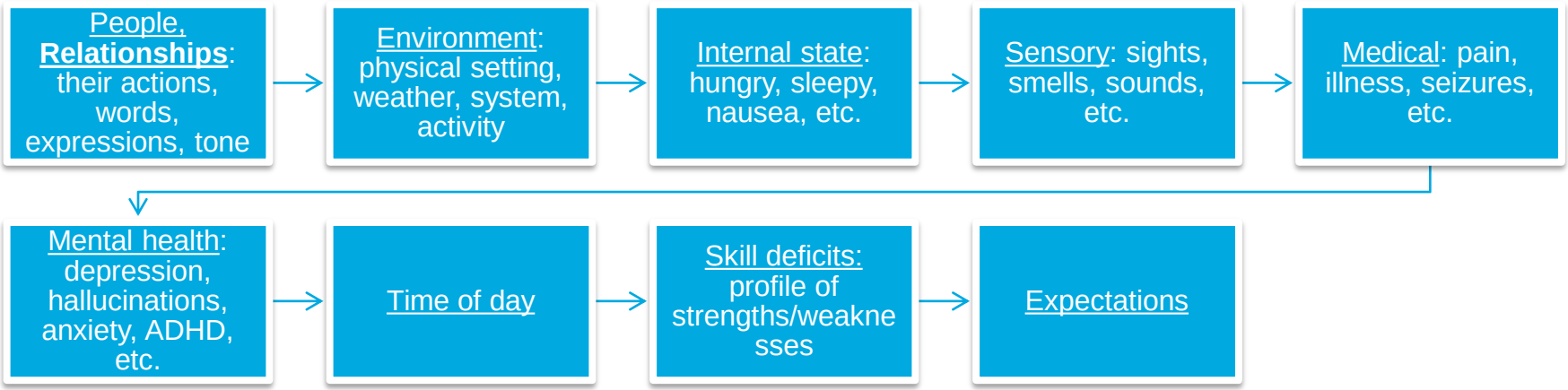
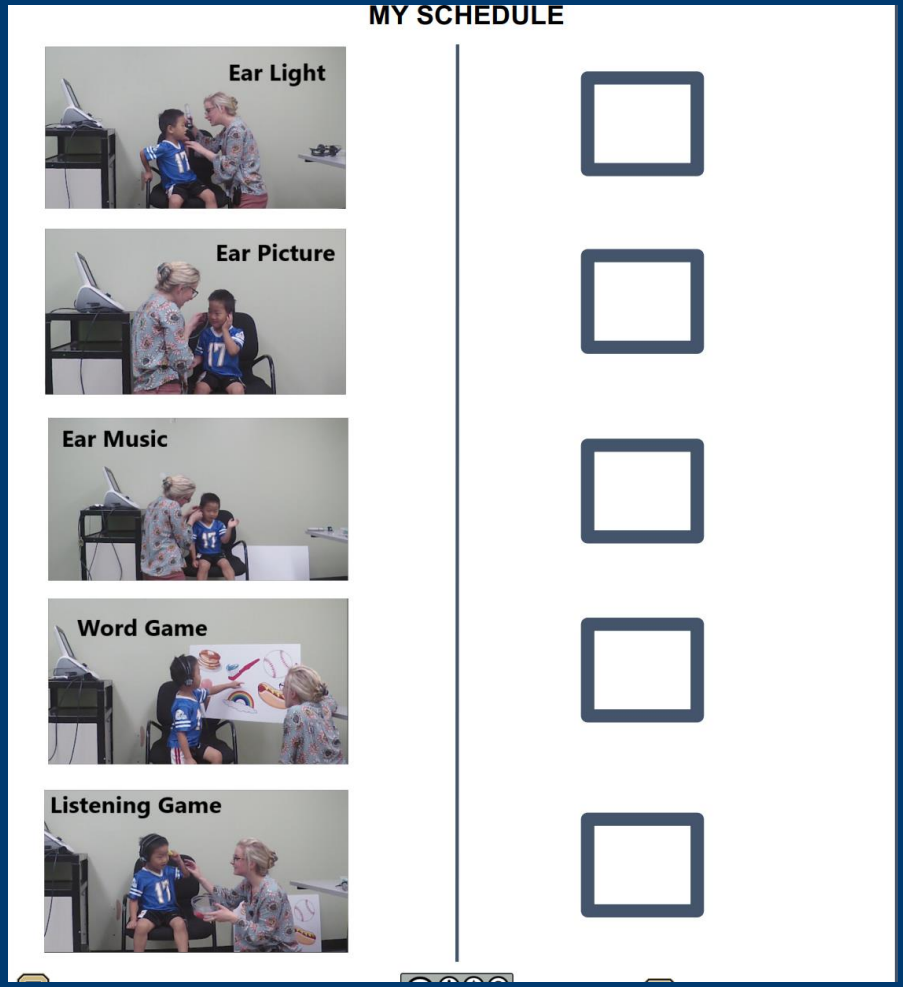
ANTECEDENTS

- The triggers or set-up that elicits the behavior/skill
- Without this initial context, the behavior/skill may not occur
- *Immediately* precede the behavior/skills

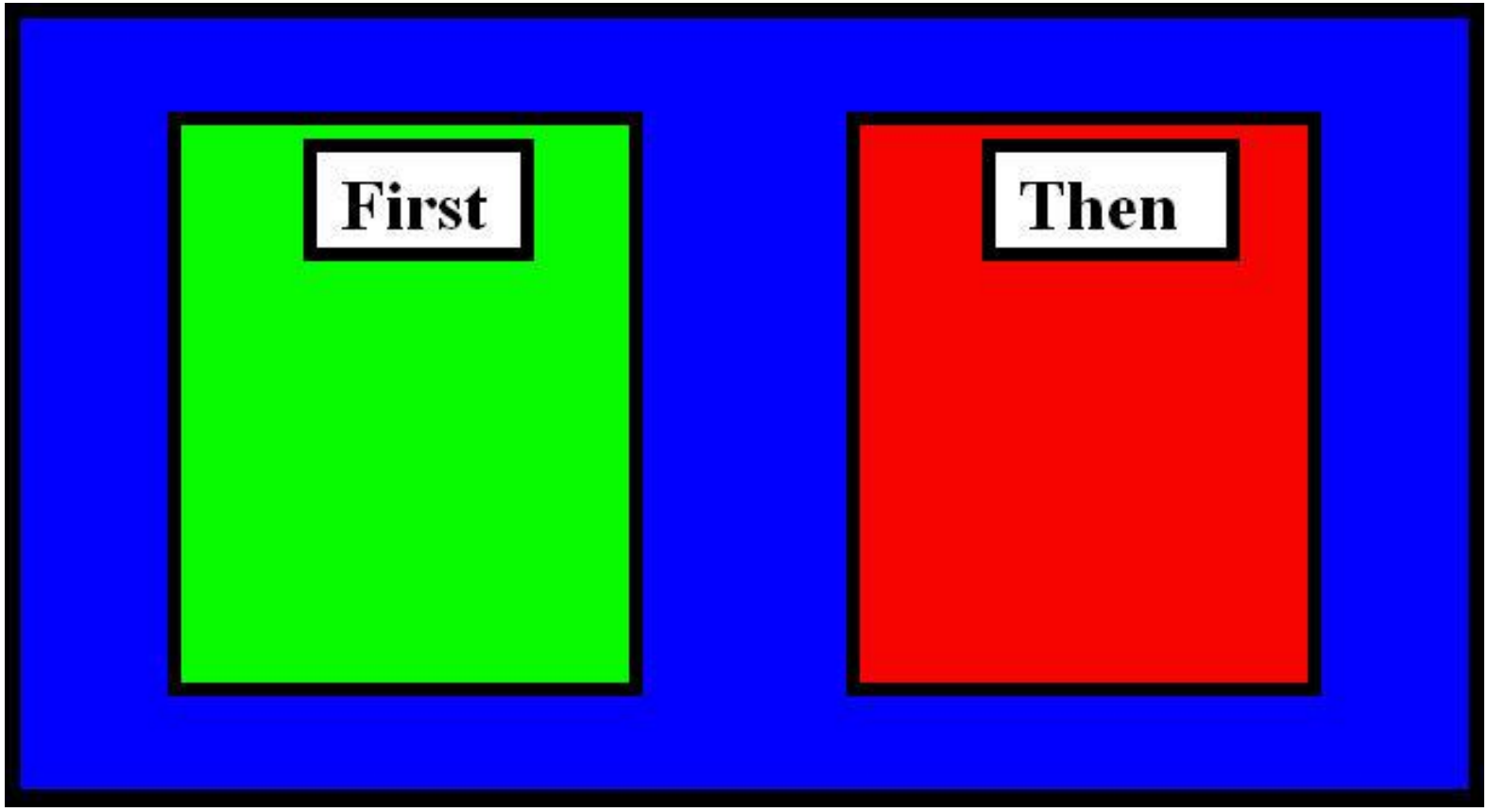
ANTECEDENT EXAMPLES





Visual schedules as an antecedent

McTee, H.M., Mood, D., Royer, W., Malley, A., Brumbach, S., Pancoast, E., Fredrickson, T., Thrasher, A., & Bonino, A.Y. (2019). Audiology video models and visual schedules. Available from: https://doi.org/10.17605/OSF.IO/B23UX


First
Then

Consequences

- The responses/reactions that occur after a behavior/skill
- These determine whether a behavior/skill will occur again over time (in future)
- They relate directly to the goal or underlying *function* of the behavior

- **What was gained?** What did the child get from the behavior/skill?
- **What was avoided?** What did the child get out of?

CONSEQUENCES

Verbal: praise	Attention: eye contact, words, body language	Ignoring
Physical actions: hugs, high fives	Tokens: stickers, stars, coins	Time out
Objects: toys, money	Edibles: candy, treats, etc.	Alone time
Corporeal punishment	Chores	Response cost: fine

Consequences

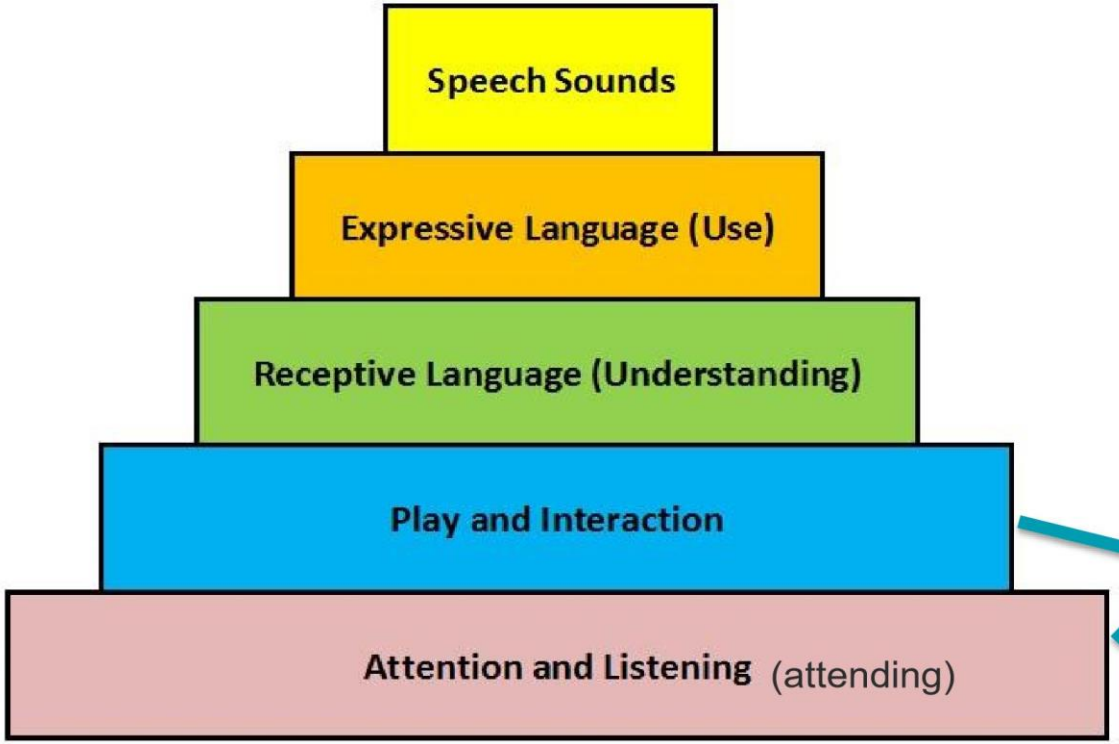
Punishment	Reinforcer:
prevents behavior/skill from meeting its goal	the goal of behavior has been met!
Makes the behavior LESS LIKELY to occur	Makes the behavior MORE LIKELY to occur
Decreases/discourages behavior over time	Increases/encourages behavior over time:

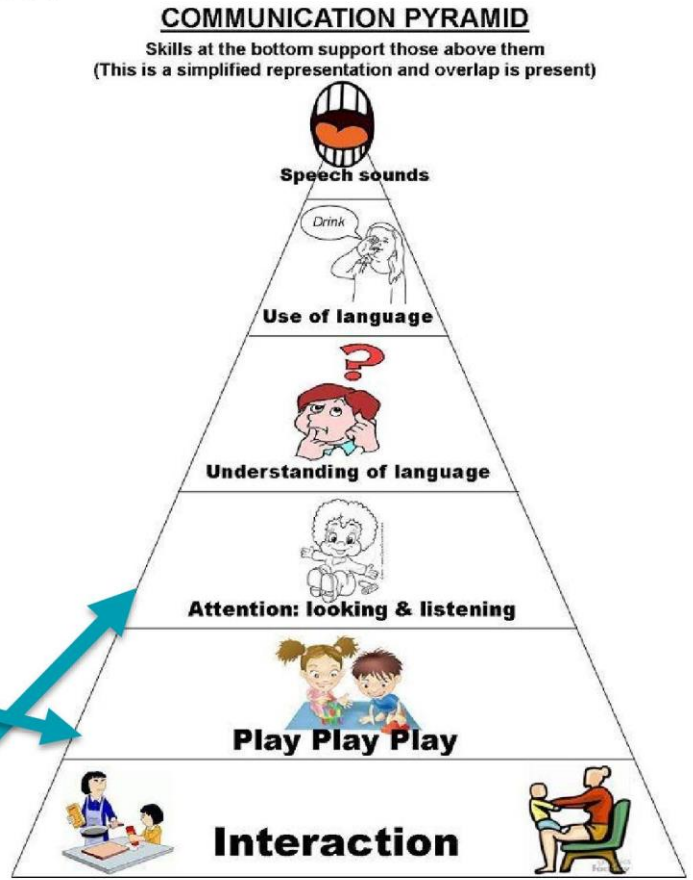
Antecedent	Behavior	Consequence
Adult places task demand	Self-injury/biting	Child removed from situation
Child is fatigued	Self-injury/biting	Child removed from situation/given adult attention
Child reaches for toy they want but adult does not recognize communicative intent	Self-injury/biting	Child removed from situation/given adult attention/may be given toy

We must be very careful what behaviors we reinforce or don’t

Who thinks interaction is first?
Who thinks attention and attending is first?

Wiley, 2019, Frontiers





Applying principles from these models to children who are Deaf/Hard of Hearing

Intervention must focus not just on acquiring auditory skills or sign skills (e.g., language) but also social aspects of language (e.g., pragmatics)

- eye contact
- posturing for social communication
- early social behaviors such as showing/giving
- joint attention
- gesture use
- attention to others' actions
- imitation
- play skills

- Use attention getting strategies to gain attention before communication
- Shift the environment to promote improved ability to easily obtain joint attention (e.g., sit across from child so they don't have to shift visual attention as far)
- When child looks spontaneously, seize the opportunity to engage in communication
- Allow for child exploration of toy before trying to interact
- Avoid making child reliant on external cues such as ("look!"/LOOK)

VL2 Research Brief #5

Early Start Denver Model- Using Joint Activity Routines(JARs) to build social engagement

1. Play with people, not objects
2. The more fun the child is having, the longer they are attending and interacting, and the more learning opportunities you can provide
3. Work to increase the “fun quotient”
4. ESDM assumes that one of the basic biological differences in ASD is a decreased internal reward from social interactions and engagement. Therefore, use enjoyable play experiences to increase :
   - ❑ child’s experience of pleasure in social interactions
   - ❑ internal motivation to seek out social engagement

Intervention does not have to look like work

What does it look like ?

Camina and drums http://vimeo.com/61626740

Logan and balls http://vimeo.com/7983899

https://www.youtube.com/watch?v=vqtgZdbK67A

Imitation Skills

Facial imitation- EX: smiles for yummy, disgust face, silly faces- may be best after child is imitating body actions

Gestural imitation= imitation of body movements without objects

- Imitating animals
- Gestures in songs
- Adult model preferred over verbal “you do it”
- Proceeds from actions able to see on self to those can’t see on self
- Management of prompting is key

Imitation actions on objects

- May be easier for some kids than vocal imitation
- Proceed from you imitating their action and they repeat to child imitating your initiation of the activity, then imitating your NOVEL action (facilitates play)

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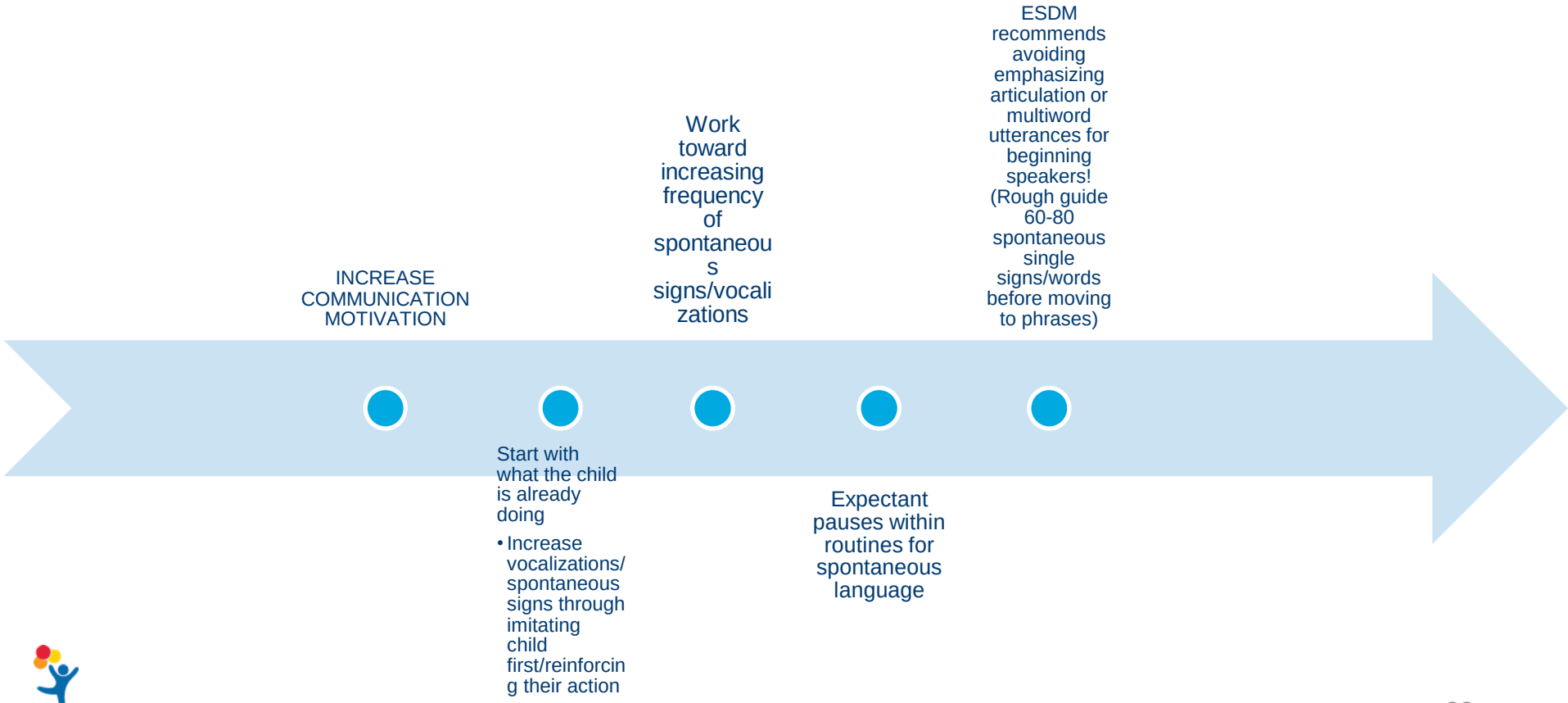
Vocal imitation

- Increase vocalizations through imitating child first/reinforcing their action
- Increase frequency of vocalizations
- Expect initiation of well established vocalizations
- Increase differentiated vocalizations- must be done with sounds within child's repertoire already
- Avoid emphasizing articulation or multiword utterances for beginning speakers!
- Repeat, but don't drill!
  - Several imitations quickly
  - Shift to an easy action
  - Manage reinforcement
  - Build up motivation for communication- most important!

Language Development –The Early Start Denver Model approach



As we explore this potential for overlap, some areas

may need to be reconciled:

Children who are Deaf/Hard of Hearing are not “hearing children who can’t hear” (Marc Marschark)

Curriculum checklist may need to start with earlier auditory skills than those included on current checklist for D/HH

Curriculum checklist needs to be modified for sign systems of communication:

- Limited information on sign language development available
- Lots of unknowns: i.e. does teaching nonmanual markers in ASL follow same course as teaching nonverbal skills? Or language skills?
- Can principles of behavioral therapy still be applied to this population?

Considerations in application to children who are deaf/hard of hearing

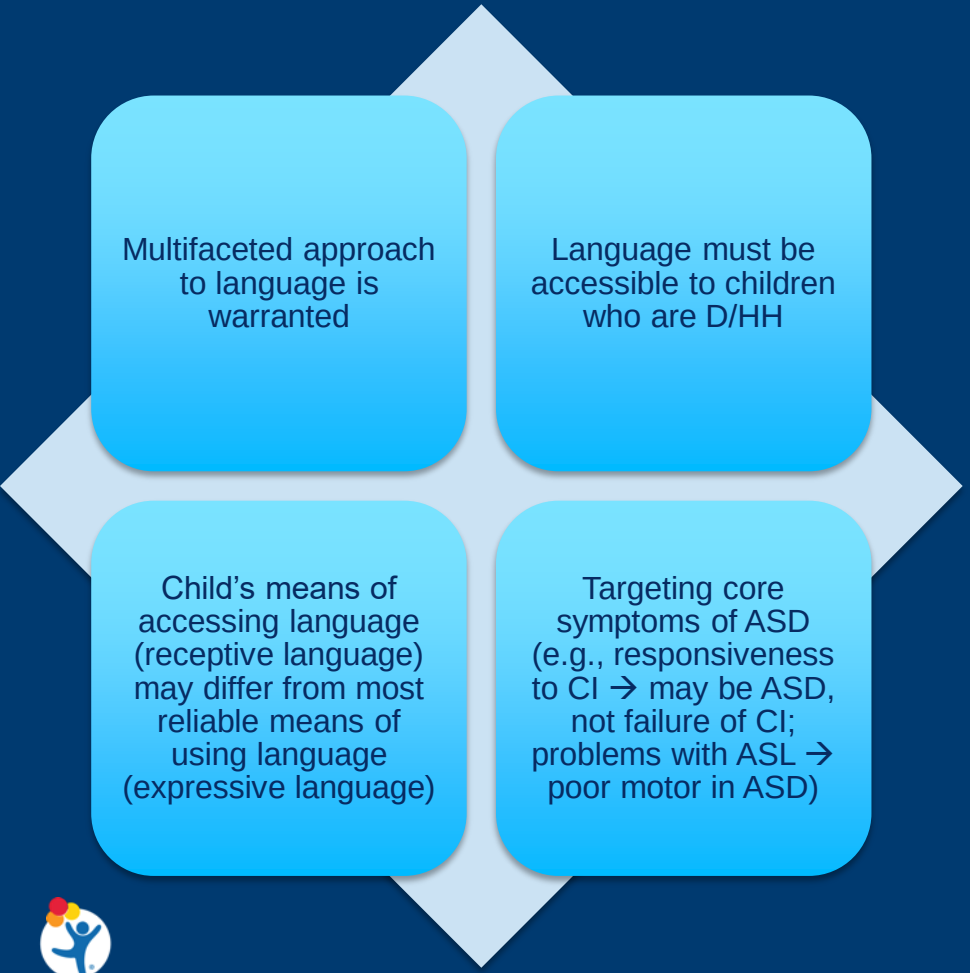
Must consider ACCESS to communication as antecedent in all behavior

Considerations for children who use both sign and spoken language, but are not fluent in either

Considerations regarding prompting of spoken language or sign language

Generalization of skills requires ability to communicate with wide variety of partners (broaden beyond adult-child communication)

Child may have a learning history which includes a lot of prompting/requests for imitation



Communication Considerations

Picture Exchange Communication System

Structured system for learning expressive communication using pictures

Builds turn taking in communication

-I must do something/communicate to get something

Move from less abstract to more abstract

actual photos to line drawings

Must have symbolic understanding first

Work to generalize across settings

Visual schedules ARE NOT PECS

When to consider AAC

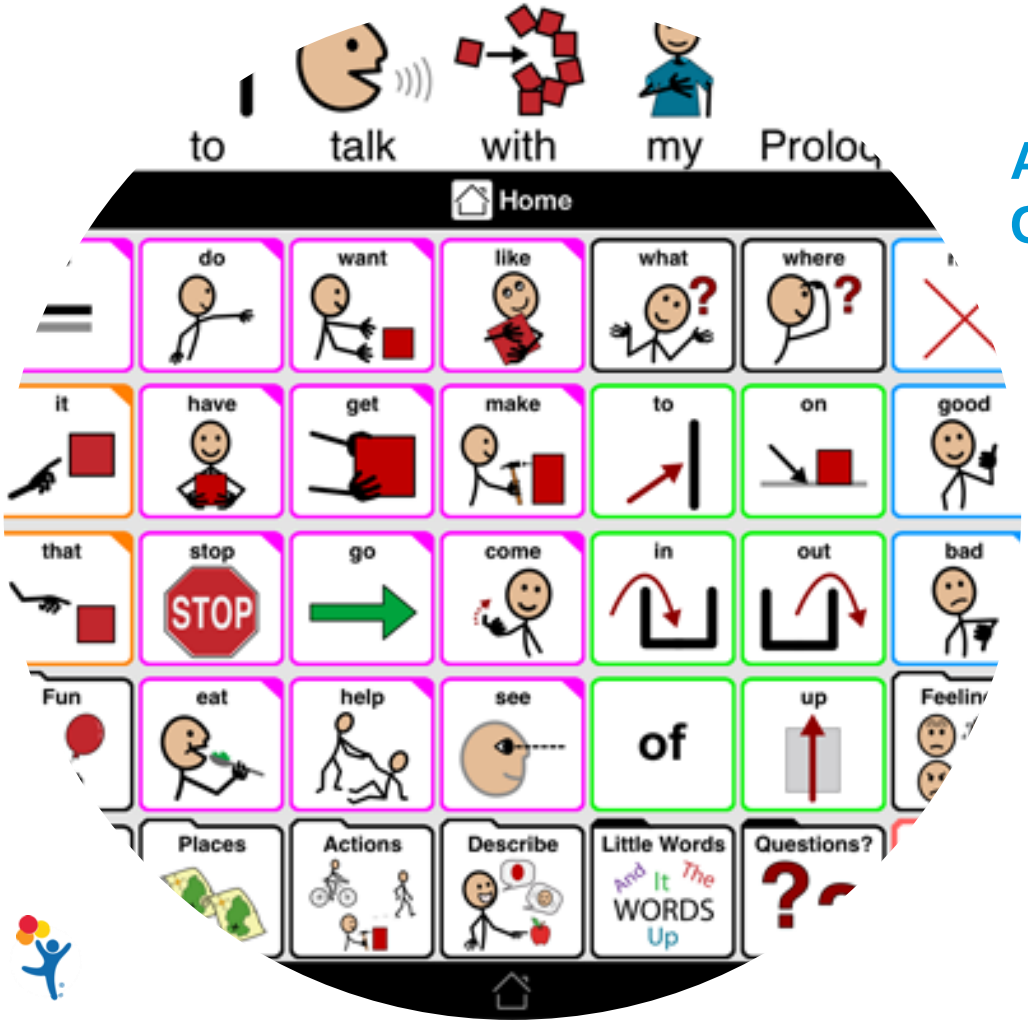
When child needs functional communication

When child has poor speech intelligibility

Motor planning or fine motor deficits make signs unintelligible

Persistent language delay/gaps between cognitive abilities and language skills

AAC interventions have been used successfully with children who are DHH (Meinzen-Derr et al, 2019)



Augmentative and Alternative Communication (AAC)

AAC interventions can decrease challenging behaviors and increase on-task behaviors (Bopp, Brown, & Mirenda, 2004)teach social language goals in place of the target behavior

Can be used to teach receptive language too

Millar, Light & Schlosser (2006) reviewed previously published studies that, among other criteria, presented data on “speech production before, during and after AAC intervention.” This review revealed that participants demonstrated the following:

-Increases in speech production—89%

- No change in speech production—11%
- Decreases in speech production—0%

Evidence based practice for ASD/DHH

"... the most important evidence supporting an EBP at the individual student level is the progress the student makes when the EBP is implemented"

http://autismpdc.fpg.unc.edu/content/ebp-fact-sheets

Regardless of hearing difference/communication modality, start with EBPs that you think will have the greatest impact on your patient (there is no simple "recipe")

Adjust intervention strategies based on progress

Plan to implement multiple strategies (e.g., language, pragmatics, behavior)

Outcomes of Children with Hearing Loss

What does the research say?

Early identification +

Early well fit amplification +

Consistent use (10 hours of use a day) +

Rich linguistic input

Best outcomes!!

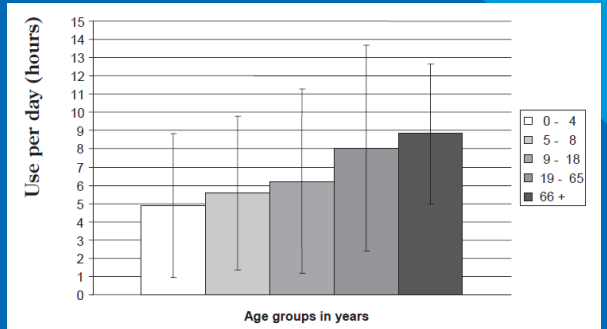
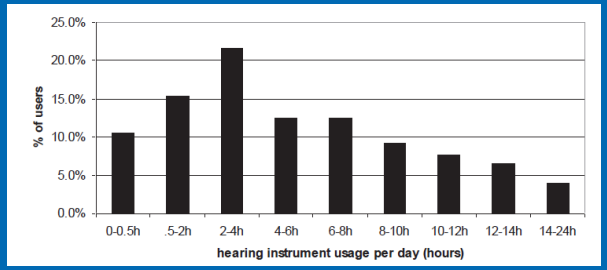


Figure 2. Average hearing instrument usage per day by age group as collected according to the hearing instrument datalogs. This graph represents data collected from all Cuper projects, not exclusively the Sound Foundations Cuper pediatric data.



Data comes from Phonak's Sound Foundations Cuper collection
N = 5000 patients and 8500 ears
Only Phonak air conduction devices in this data set

What does the research say for hearing device outcomes and use in children with Developmental Delays?

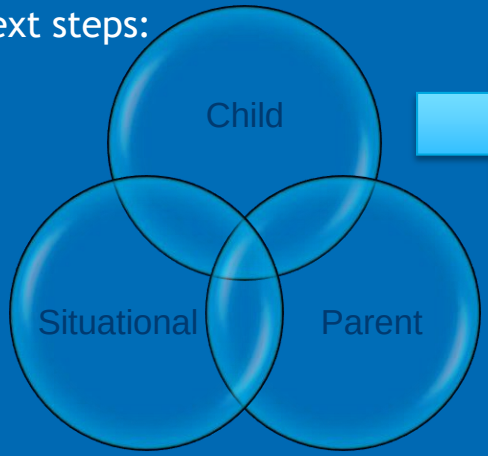
- 20-40% of children with Developmental Delay also have hearing loss
- Research is limited
- Themes
  - Research is more focused on outcomes with Cochlear Implants
  - Children with developmental disabilities can and do benefit from hearing aids and CI's
  - Benefit may be obtained at slower rate and not to the same level as typically developing peers

Why is this important?

Research limitations

- Rarely looks at kids with DD who are hearing aid users
- Primarily outcome based: few studies explore factors contributing to reduced device use

Next steps:



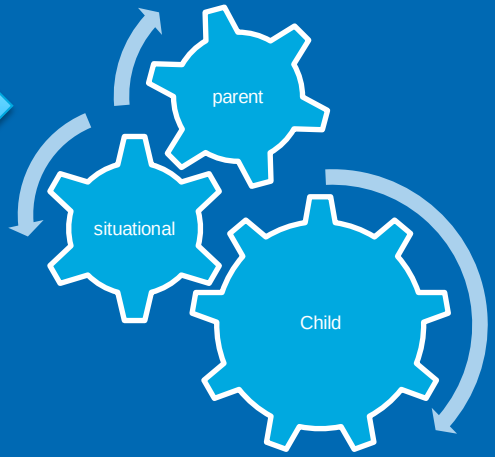


Image from Hearinglikeme.com

Redefining/reframing compliance

Behavior	Possible interpretation	Developmental/Behavioral informed interpretation	Intervention
4-9 month old removes hearing aids	“They don’t like them” “They hurt”	Baby is in sensorimotor stage of development, exploring what is/isn’t part of their own body	Encourage parents to be persistent in monitoring baby, replacing device, commenting positively
2-3 year old throws hearing aids	“They don’t like them” “They hurt” “too loud”	Consider function of behavior: is child throwing them to communicate frustration? Is child exerting independence/choice making?	Coach to recognize cues of frustration and to appropriately label cause of frustration -Teach child alternative communication strategies
5 year old, new dx HL, ASD	-“It hurts” -“Doesn’t want to look different” -“refuses to wear it”	-possible sensory overload -difficulty adjusting to change -low tolerance for new/unfamiliar perceptual experiences	-introduce regulating sensory experiences prior to introduction -explain experience in meaningful way to child (i.e., connect to their own experience) -gradual desensitization -use visuals to teach concept of rating loud/soft or pain

Help for hearing device users clinic

Interdisciplinary Team

- Psychology
  - Dr. Mood
  - Dr. Patel
- Audiology
  - Dr. Nightengale

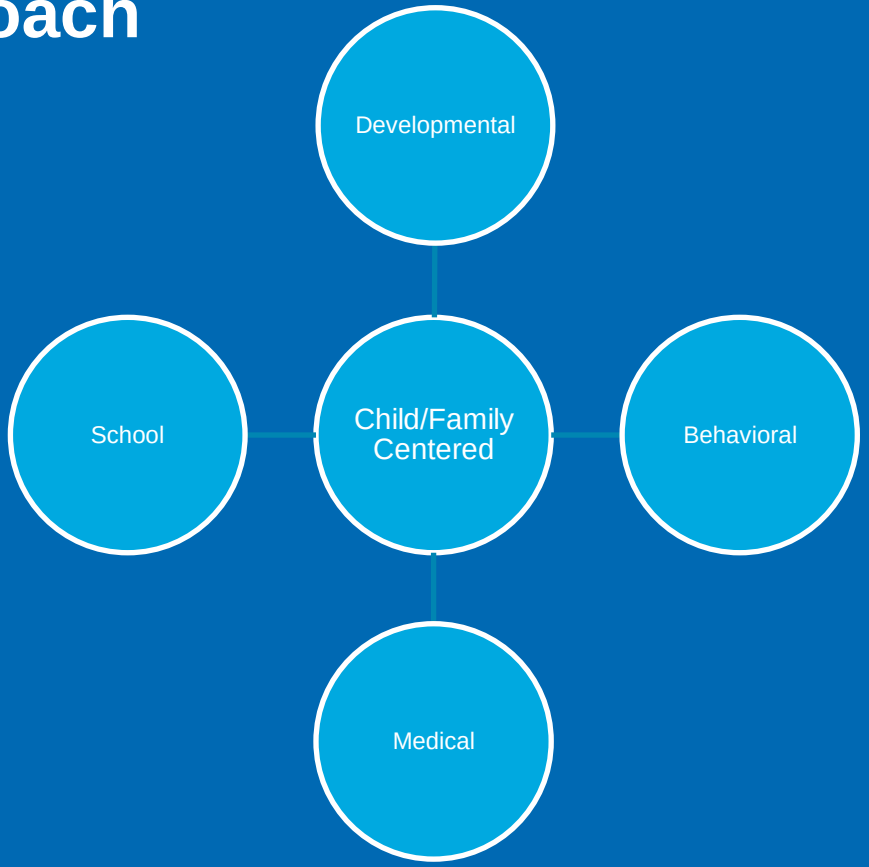
Referrals

- Referrals from managing audiologist
- Patients
  - Any child not wearing device per recommendations for whom first line interventions have not been successful
  - May/may not have developmental concerns

Structure

- Dr. Nightengale floats between staggered appointments with Dr. Mood and Dr. Patel
- Generally allotted up to 2 hour session to allow time for interview/desensitization work
- Option to use Cool Zone

Our Approach



Investigating/Observing

Audiological	•Age of identification •Degree/type of hearing •Past success with device
Medical history	•Other medical concerns •Examples: mastoiditis, cancer treatment, chronic ear infections
Developmental history	•Presence of any developmental disabilities (ASD, attention concerns, ID) •How does child communicate pain/frustration? •Informs strategies we use
Family perspective	•culture •perspective/adjustment to hearing loss and medical dx •parenting style

Case study: Developmental

Sensory regulation

Special Interests

Visual Supports

Communication Needs

Routines

Incorporating Special Interests

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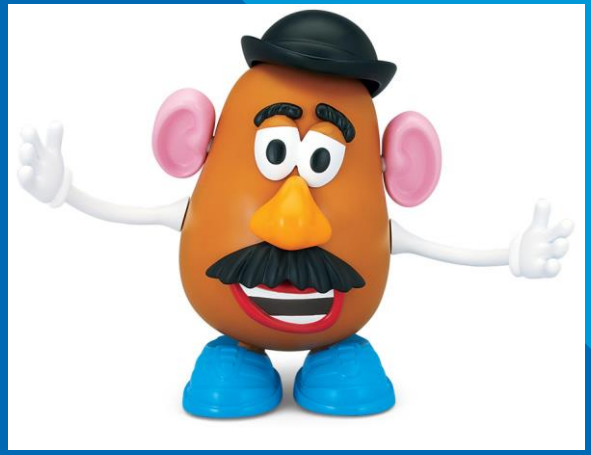
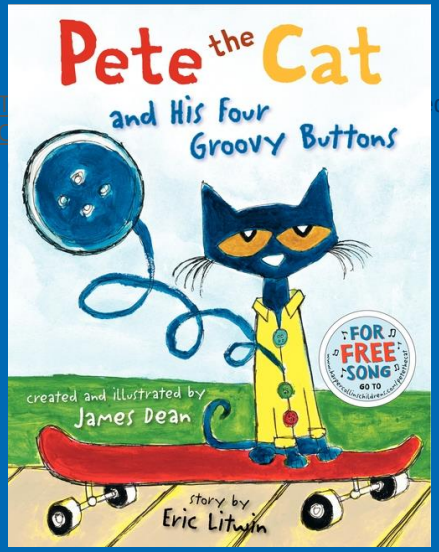
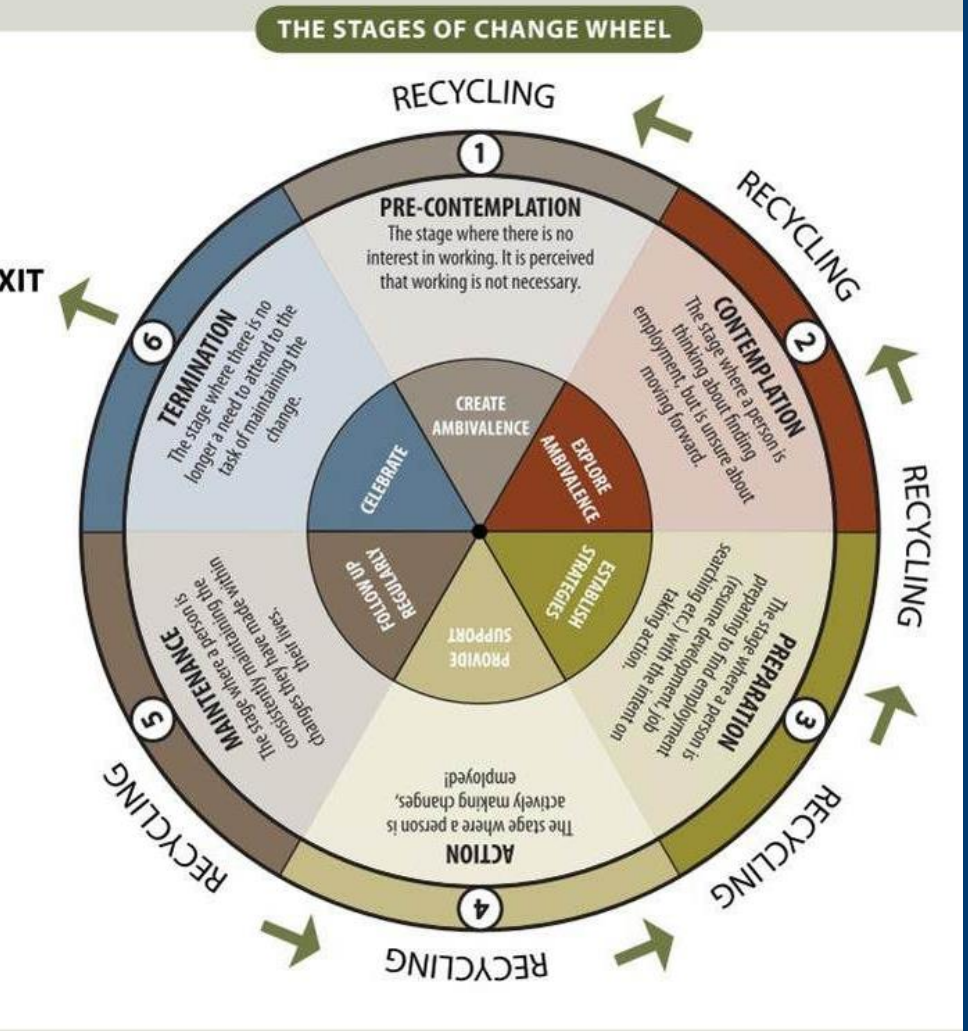




Example hierarchy

- Full time hearing aid use
- Aids on, turned on, longer increment
- Aids on, turned on, short increment of time, highly preferred activity
- Aids on, turned off
- BTE part without molds inserted, turned off
- Allow touch on head
- Tolerate hearing aids out, in reach/eyesight



Parent factors

- Look for parenting approach to inform whether you need interventions specific to hearing aids or broader information

- Attend to family's language for insight into their perspective

  "feel so sorry for her"

  … "he responded (to the hearing aid) as if it was the end of the world"

- Examples:

Patient with cancer: cognitive reframing

Parent adjustment/cultural factors: child with microtia

Parent mental health considerations

  Post partum depression

Behavioral considerations

- Child factors
  - Investigate motivators
  - For example, a child may be motivated by music/technology think flexibly about incorporating
- Past history
  - Negative medical experiences
  - Inadequate programming
- Anticipating potential pitfalls and proactively managing (e.g., sticker box)

4th Annual

Deaf+Autism Family Day at Happy Dog Ranch

with funding from CCDHHDB

Save the Date!

Saturday, September 28th, 2019

9:30am-1:00pm

For information: info@cohandsandvoices.org or www.naturalwisdomcounseling.com

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Past Volunteer Organizations:

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Deaf Overcoming Violence through Empowerment

Marion Downs Center
HEARING • SPEECH • LANGUAGE

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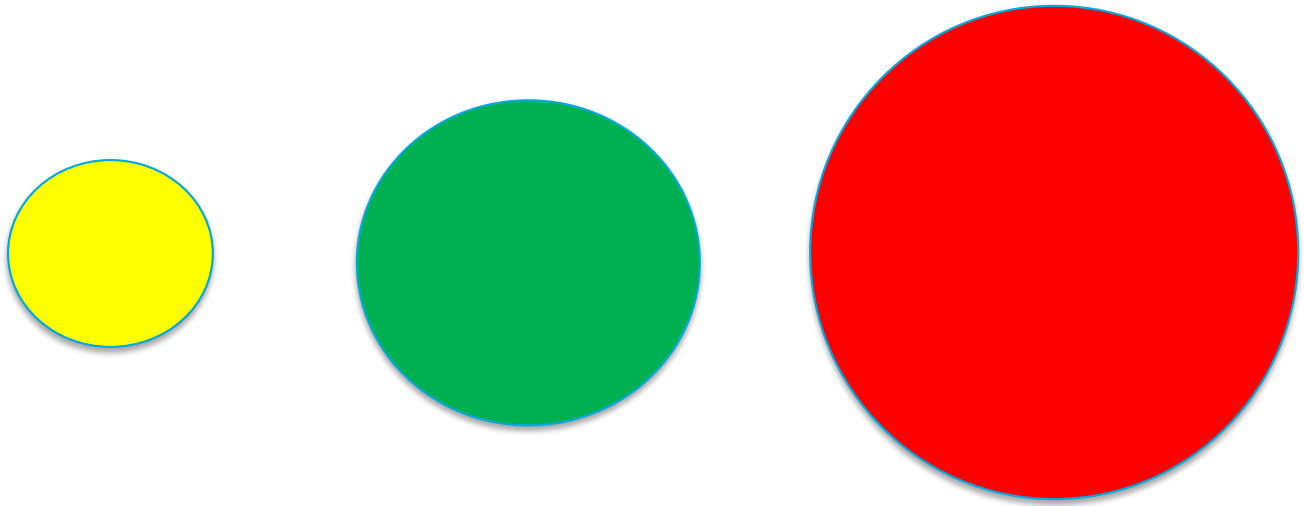


Too Loud

Just Right

Too Soft

Quiet

Loud

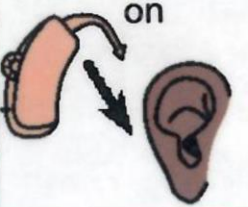
wake up

brush teeth

shower

get dressed

put hearing aid on



breakfast

ride bus

school

lunch

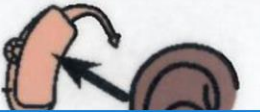
homework

choice time

dinner

put on pajamas

take out hearing aid



bedtime