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# WHY DOES AUDITION MATTER?

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## OBJECTIVES

- Define neuroplasticity and discuss how this impacts hearing across the lifespan
- Discuss evidence for auditory-based intervention
- Discuss consequences of untreated hearing loss in adults




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## ORGANIZATION


- Pair & Share
- Comment Cards
- Feedback Cards



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## WHAT DO YOU HOPE TO LEARN? (Pair & Share)



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## WHAT DOES NEUROPLASTICITY MEAN TO YOU? (PAIR & SHARE)



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## NEUROPLASTICITY (INFANTS & TODDLERS)

- The central auditory system is highly plastic during early childhood (Carden, Campbell, Sharma, 2012)
- Greatest during the first three years of life (Sharma & Nash, 2009)
- By 6 months: remember words in short passages if they follow their name (also words after "mommy")
- Children learn best when people are present
- Everything a baby sees, hears, touches, and smells influences the way the brain gets hooked up
- Deprived environments can cause neurological damage
- A brain can physically expand and contract depending on experience
- Preschoolers are alien geniuses (from a neurology perspective)

Cole, E. B., & Flierer, C. (2016); Gopnik, A., Metzloff, A., Kuhl, P. (1999)

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### NEUROPLASTICITY (CHILDHOOD)

- Between the ages of 6-12 years old, the final step in structural maturation of the auditory cortex occurs
- Gains in the ability to discriminate speech under difficult conditions develops (speech in noise) in the later developing years (Moore & Linthicum, 2007)
- "Trajectory of vocabulary growth are the foundations of analytic and symbolic competencies...in later years" (Hart & Risley, 1999, p. 193)

Moore, J. & Linthicum, F., (2007)

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### NEUROPLASTICITY

What does this mean for children with hearing loss?

1. Stimulation/input is key
2. Timing (the earlier- the better!)
3. Intervention
4. Brain development doesn't stop at 3 years of age

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### NEUROPLASTICITY (ADULTS)

"A brain can only reorganize itself around the sensory stimulation it receives." (Cole & Flexer, 2016, p. 9)

- **Hearing impairment:**
- independently associated with accelerated cognitive decline, 30 - 40% faster decline (Lin et al., 2013)
- Increased risk of dementia (Gallacher et al., 2012; Lin, Metter, et al., 2011)
- Neuroimaging has shown reduced cortical volumes in auditory cortex (Peelle, Troiani, Grossman, & Wingfield, 2011)
- Can cause accelerated rates of lateral temporal lobe and whole brain atrophy (Lin et al., 2014)
- Mild (2-fold), moderate (3-fold), and severe (5-fold) increased risk of dementia (over 10-year follow-up) (Lin, Metter, et al., 2011)

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### WHAT CAN WE DO ABOUT IT?

- Access to sound! - Audiology
- Auditory-Verbal Therapy
- Auditory-Based Intervention

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### WHAT IS THE DIFFERENCE BETWEEN:

- (1) Auditory-Verbal Therapy and Traditional Speech Therapy Services
- (2) Aural habilitation and Aural rehabilitation

(PAIR & SHARE)

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### What is AVT?

**Auditory-verbal therapy:**



- Guiding principles that emphasize coaching parents to play integral roles in their child's treatment plan development and intervention
- Parent/Caregiver *required* to be active participant in every therapy session
- Can serve as a supportive role to education-based ST

**Requirements after graduate school:**

- 900 Hours of Auditory-Based Intervention (SLP Master's Degree required 375)
- 80 Continuing Education Hours
- Mentored by AVT throughout entire process
- Must pass 4 hour case-based exam (60% pass rate)

**Handouts**

- Educational Roles
- School Handout
- Resource Handout

**WHAT IS YOUR TAKE-AWAY? (PAIR & SHARE)**

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