

Effect of Early Intervention Intensity on the Language of Children with Hearing Loss

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Thanks to....

CDC & DRDC

NECAP States

Students & Team at CU Boulder

Interventionists

Children & families who participated





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Today's Topics

- **What do we know**
 - & still need to learn?
- **Our study**
- **Our results**
 - & why is this important



The literature

What do we know?



What do we still need to learn?



Research Questions

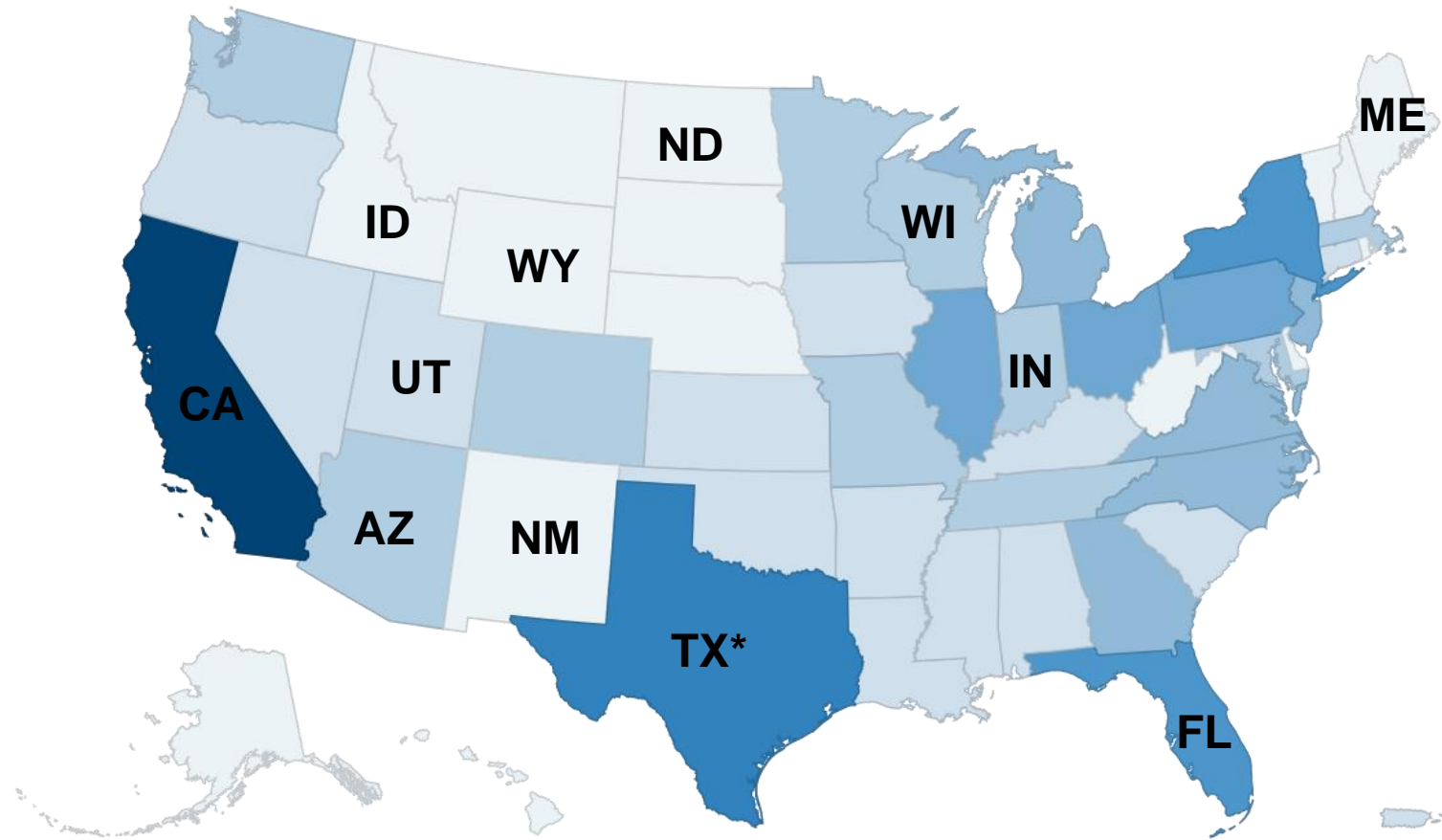
- (1) Does a relationship exist between language scores and the amount of services a child receives?**
- (2) If there is a relationship, what is the causal direction of any such relationship?**



Study Design, Methods & Participants



National Early Childhood Assessment Project: NECAP – States in Analysis



Data Analyzed

National Early Childhood Assessment Project
University of Colorado - Boulder
Department of Speech, Language and Hearing Sciences
AUTHORIZATION FOR RELEASE OF AUDIOLOGIC INFORMATION

I give permission to: _____
(Name of audiologist or physician)

at: _____
(Name of agency, hospital, or facility)

(Address of facility; include number, street, city, state, and zip code)

to release all audiologic information (audiograms, audiology reports, and other hearing test results) gathered on:

(Child's name) _____ (Child's date of birth) _____

(Parent's or guardian's name) _____

(Address: include number, street, city, state, and zip code)

This audiologic information should be released and sent to:


Dr. Allison Sedey, NECAP Coordinator
University of Colorado - Boulder
409 UCB
Boulder, CO 80309

This release will continue to be in effect for one year from the date stated below. I understand that I may revoke this authorization in writing at anytime.

(Signature) _____ (Date) _____

(Relationship to Child)


Child's Name _____ Birthdate _____	Sex _____ Today's Date _____
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Words and Gestures

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Parent Mark
☐

Verbal Marks
☐ ☐ ☐

PART I EARLY WORDS

A. FIRST SIGNS OF UNDERSTANDING

Before children begin to speak, they show signs of understanding language by responding to familiar words and phrases. Before we score accurately, does your child do any of these?

	Yes	No
1. Respond when named (called by, he, turning and looking at parent)	<input type="radio"/>	<input type="radio"/>
2. Respond to "no" or "yes" (stopping what he/she is doing, at least for a moment)	<input type="radio"/>	<input type="radio"/>
3. React to "show" (pointing/looking) by looking around for them	<input type="radio"/>	<input type="radio"/>

B. PHRASES I USE

In the list below, please mark the phrases that your child seems to understand

understands	understands	understands
Are you hungry?	Don't touch it.	Open your mouth.
Are you tired/sleepy?	Get up.	Get down.
Be careful.	Give it to me/bring.	Get it out.
Be quiet.	Give me a hug.	Stop it.
Clap your hands.	Give me a kiss.	Time to go right night.
Change diaper.	Get girl.	Wash the face.
Come here/come out.	Goodbye.	This little piggy.
Don't/remember's name.	Hi/Hi all.	Want to go for a ride?
Do you want more?	Let's go for her.	
Don't do that.	Look back here.	

MacArthur Inventory for Children (M-CDI) © 1997 University of Chicago Press
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National Early Childhood Assessment Project: NECAP
INITIAL DEMOGRAPHIC FORM

NOTE: To be completed by the parent and/or the early intervention provider the first time the child is assessed with NECAP

GENERAL INFORMATION: Today's date: ____/____/____
mon day year

Child's Name: _____

Parents' names: _____ Phone: _____

Address: _____ City: _____

State: _____ Zip Code: _____

Parents' e-mail address: _____

Birthdate of child: ____/____/____
mon day year

Gender of child: ____ Boy ____ Girl

1. Family qualifies for Medicaid or state equivalent: yes no unknown
(Qualifies based on income; if qualifies but does not receive assistance, still check "yes")

2. Ethnicity of child: ☐ Hispanic/Latino ☐ NOT Hispanic/Latino

3. Race of child (check all that apply):

☐ White ☐ Native Hawaiian or Other Pacific Islander

_____ Black or African American _____ American Indian or Alaska Native

_____ Asian _____ Other (Please specify: _____)

4. Languages used at home with the child: (Please check all that apply)

_____ Spoken English _____ Spanish

____ Sign Language ____ Other (Specify: _____)

HEARING INFORMATION:

1. Did the child fail a newborn hearing screening? ☐ yes ☐ no ☐ did not receive

2. Onset of hearing loss: ☐ Present at birth ☐ Acquired after birth ☐ Don't know

If acquired, at what age? _____ months of age

3. Age at which hearing loss was confirmed by an audiologist: _____ months of age

4. Age at which first received amplification: _____ months of age

Participants Included in Analysis



BILATERAL HEARING LOSS -
ONSET OF HEARING LOSS: 97%
CONGENITAL, 3% ACQUIRED (ALL
PRIOR TO 8 MONTHS OF AGE)



ENGLISH WAS THE PRIMARY
WRITTEN LANGUAGE OF THE
HOME



NO ADDITIONAL DISABILITIES



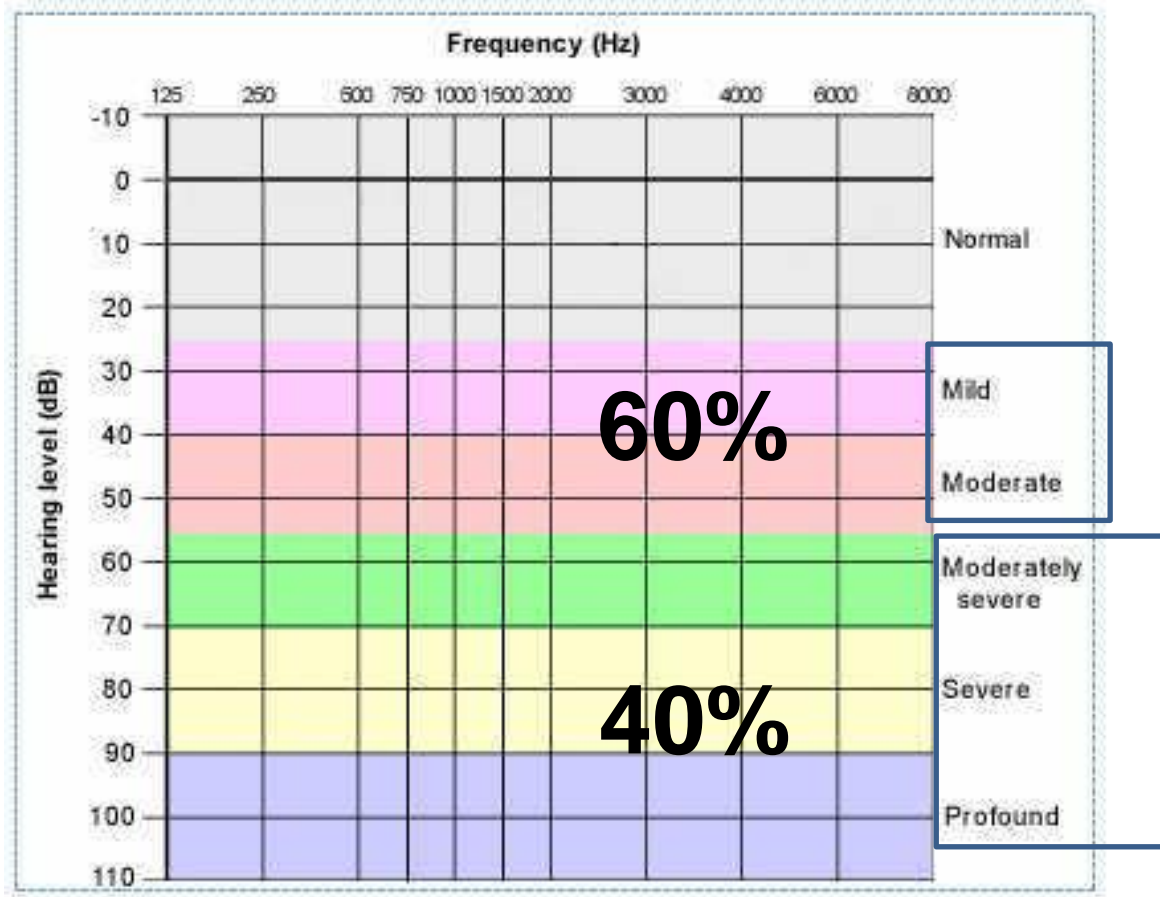
Table 1. Participant and Family Demographic Characteristics

Characteristic	Percentage of Participants
Gender	
Male	46%
Female	54%
Ethnicity	
Non-Hispanic	80%
Hispanic	20%
Race	
White	87%
African American/black	2%
Asian	2%
Native American	1%
Hawaiian/Pacific Islander	1%
Mixed race	7%
Communication mode used with the child	
Primarily spoken language	79%
Spoken language only	29%
Spoken with very occasional use of sign	50%
Sign language + spoken language	19%
Sign only	2%
Hearing status of the parent	
Both parents hearing	81.5%
One or both parents deaf/hard of hearing ^a	18.5%
Mother's highest educational degree	
Less than high school	7%
High school	34%
Vocational	5%
Associates	16%
Bachelor's	26%
Graduate	12%

^aOf the parents who were deaf or hard of hearing, 55% used sign language when communicating with their child.




Participants



Participants


Count 1-3-6 Steps to Open the Door to Your Child's Language and Early Learning

By 1 Month
Newborn Hearing Screening
Can your baby hear every sound?




- Newborns should receive several screenings to rule out serious conditions at birth.
- Can your baby hear well? Ask for a hearing screening at birth. The screening will show if your baby's ears are receiving all sounds.
- Most babies sleep right through the fast screening process.
- Use EHDI-PALS to find local facilities for hearing tests.

By 3 Months
Know for Sure - Diagnostics
Complete testing with a Pediatric Audiologist



- If your baby doesn't pass the screening in one or both ears, get a full hearing test by someone with special training & equipment who works with babies by three months of age. (Pediatric Audiologist)
- Why the hurry? Babies can avoid sedation with early testing and you'll be helping your baby in a period of rapid brain growth.
- This is a great time to connect with other parents who have children who are deaf/hard of hearing and meet Deaf/hard of hearing adults.

By 6 Months
Begin Early Intervention-The Key
Qualified experts in early childhood hearing loss



- All babies identified with hearing loss in one or both ears should receive critical language and developmental services by 6 months of age.
- "EI" support from birth to age three can help a child enter school with skills on track with typically hearing children.
- Families can enroll as soon as a hearing loss is identified.
- Signing a release of information helps professionals support you in getting your baby to the next step.
- Contact your local EI Coordinator (at the link below) and ask for experienced birth-to-three providers in your area.

"Early intervention changed our daughter's life. We are grateful for the early identification and the team who surrounded our family." A parent of a child with hearing loss

74% Met

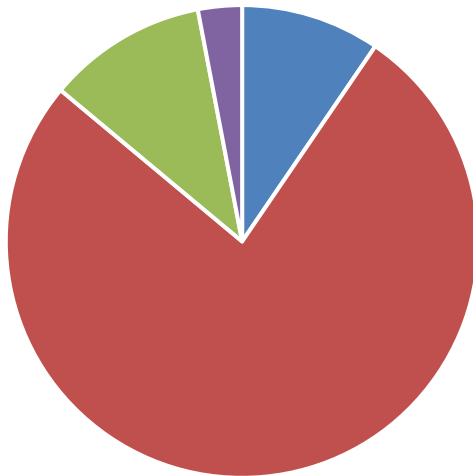
26% Did Not Meet



Participants

1st Assessment

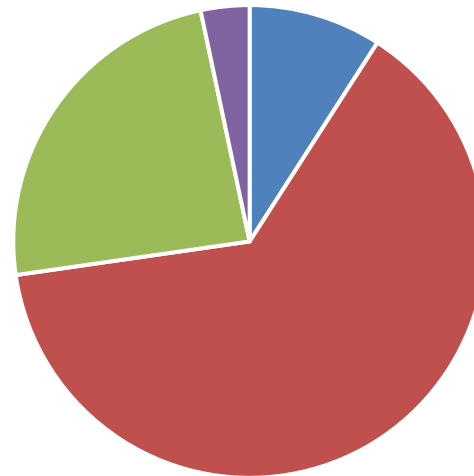
Type of Amplification



- None (9.5%)
- Hearing Aids (76.3%)
- CI (10.9%)
- Bone Conduction (3.3%)

Final Assessment

Type of Amplification



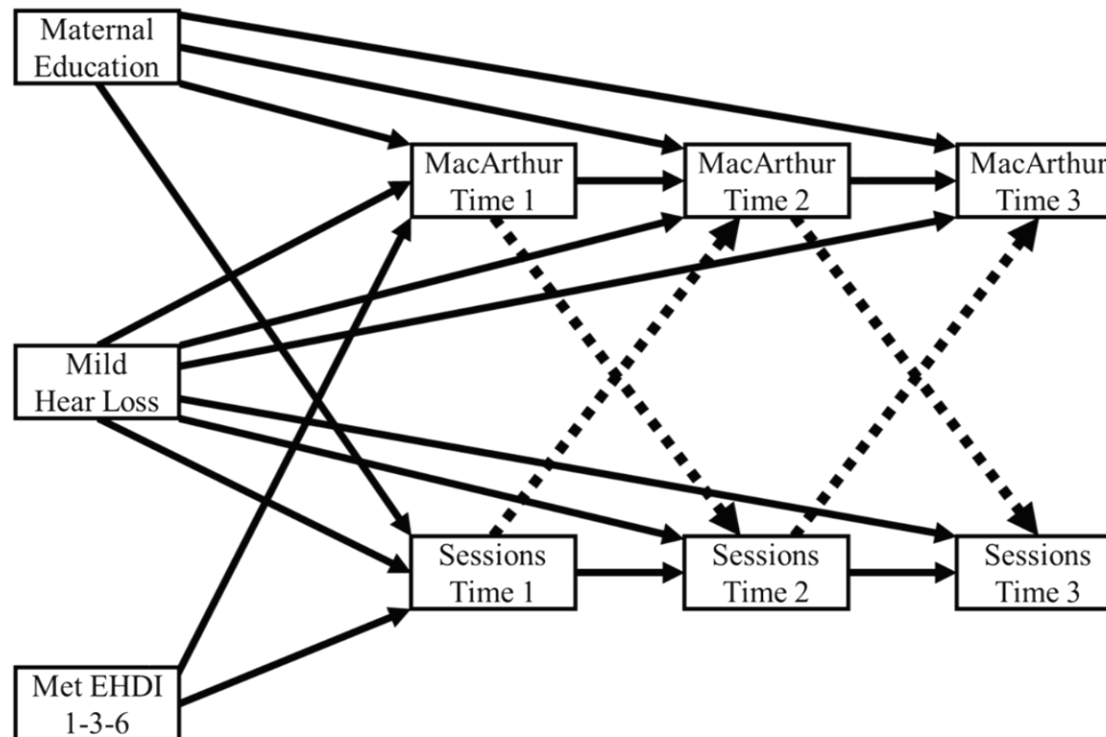
- None (9%)
- Hearing Aids (63%)
- CI (23.7%)
- Bone Conduction (3.3%)



Model



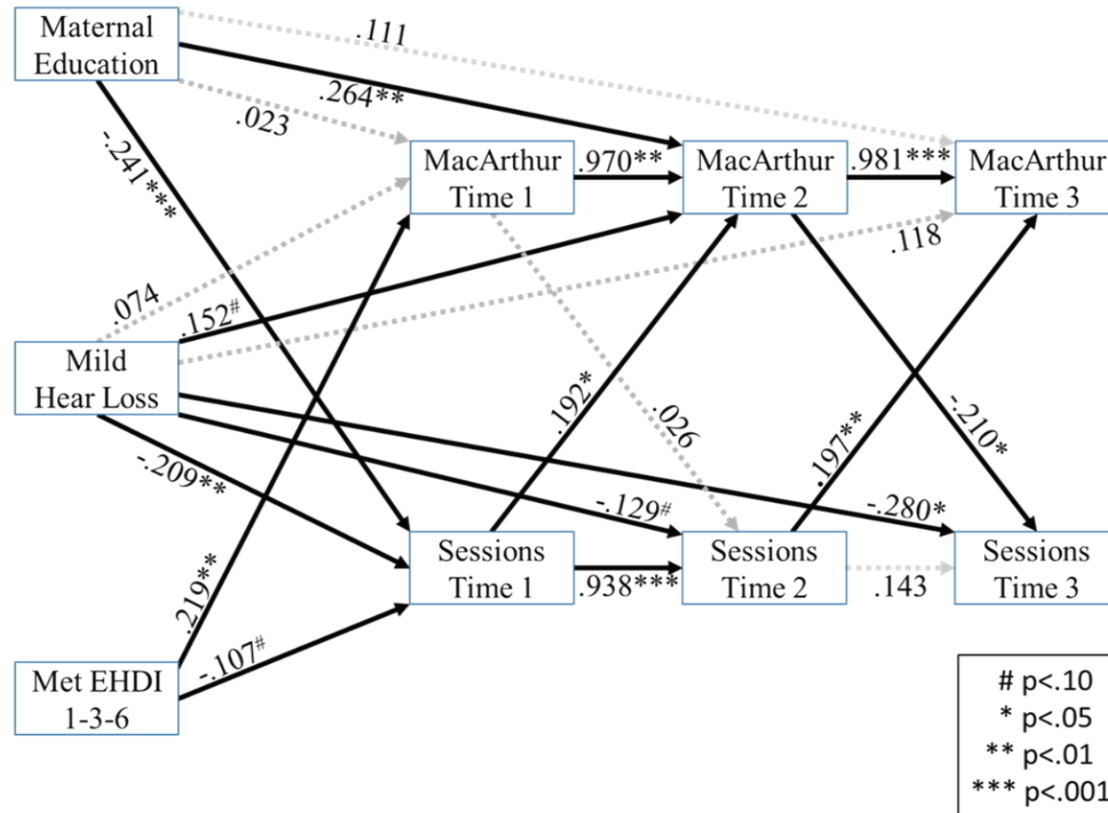
Structural equation model predicting MacArthur performance and number of sessions over time



Analysis & Results



Results of structural equation analysis (standardized coefficients)



Findings

- **Hearing Loss:**

- Having a mild/moderate hearing loss, rather than moderate/severe to profound hearing loss, was associated with fewer sessions at both Time 1 and Time 3, and was marginally significant at Time 2.
- A mild/moderate hearing loss, rather than moderate/severe to profound, was also associated with higher MacArthur scores at Time 2.

- **Maternal Education:**

- Maternal education was negatively related to the number of sessions at Time 1, with children of more educated mothers initially receiving fewer sessions.
- Finally, maternal education was positively related to MacArthur scores at Time 2, reflecting higher language skills for children of more educated mothers.



Findings

- **Language Scores – Intensity of Intervention**
 - increased number of sessions at Time 1 predicting future MacArthur scores at Time 2,
 - and number of sessions at Time 2 predicted future MacArthur score at Time 3
- **Additionally –**
 - In contrast, language scores at Time 1 were not associated with the subsequent number of sessions at Time 2; however, higher language scores at Time 2 were predictive of subsequently fewer sessions at Time 3.



The work continues....

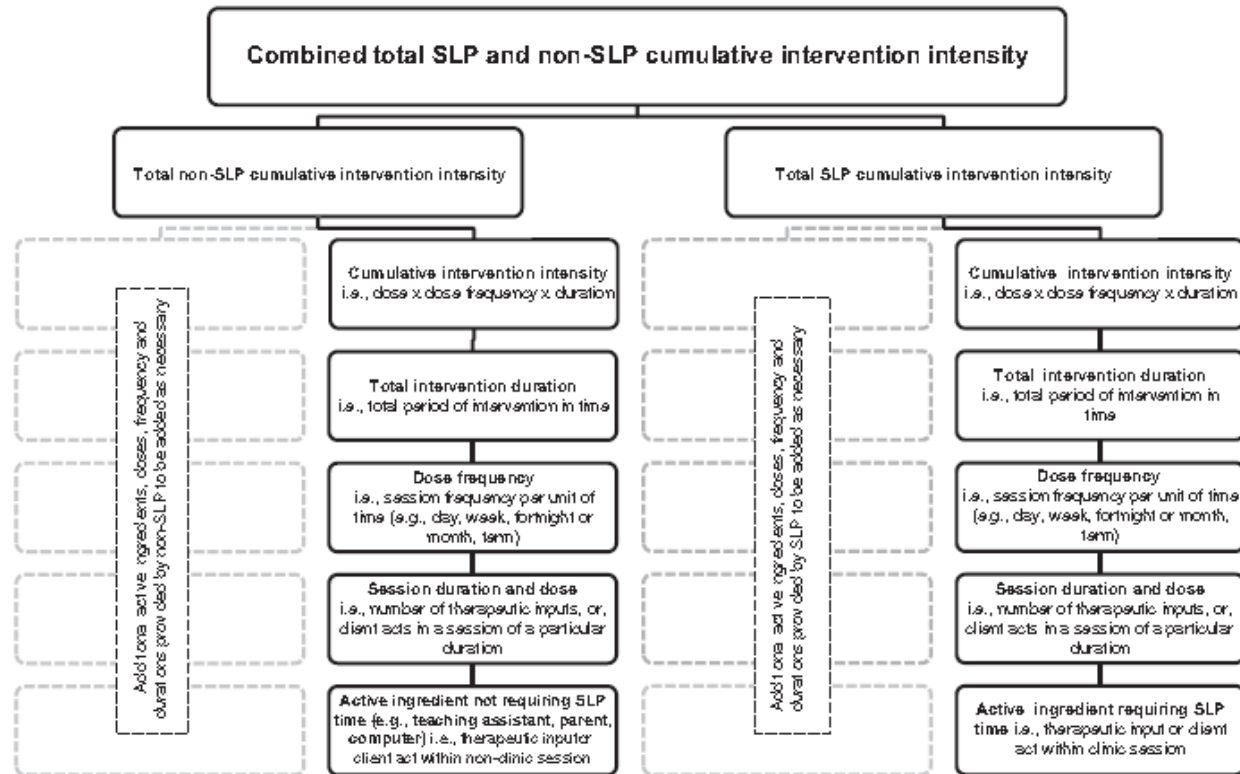


Figure 3. Framework for guiding the measurement of all client acts and/or therapeutic inputs within and beyond sessions, to determine the optimal intervention intensity of speech-language pathology interventions.

Baker, 2012



Thank you for attending!

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