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

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University of Colorado
Boulder

Thanks to….

CDC & DRDC

NECAP States

Students & Team at CU Boulder

Interventionists

Children & families who participated

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?

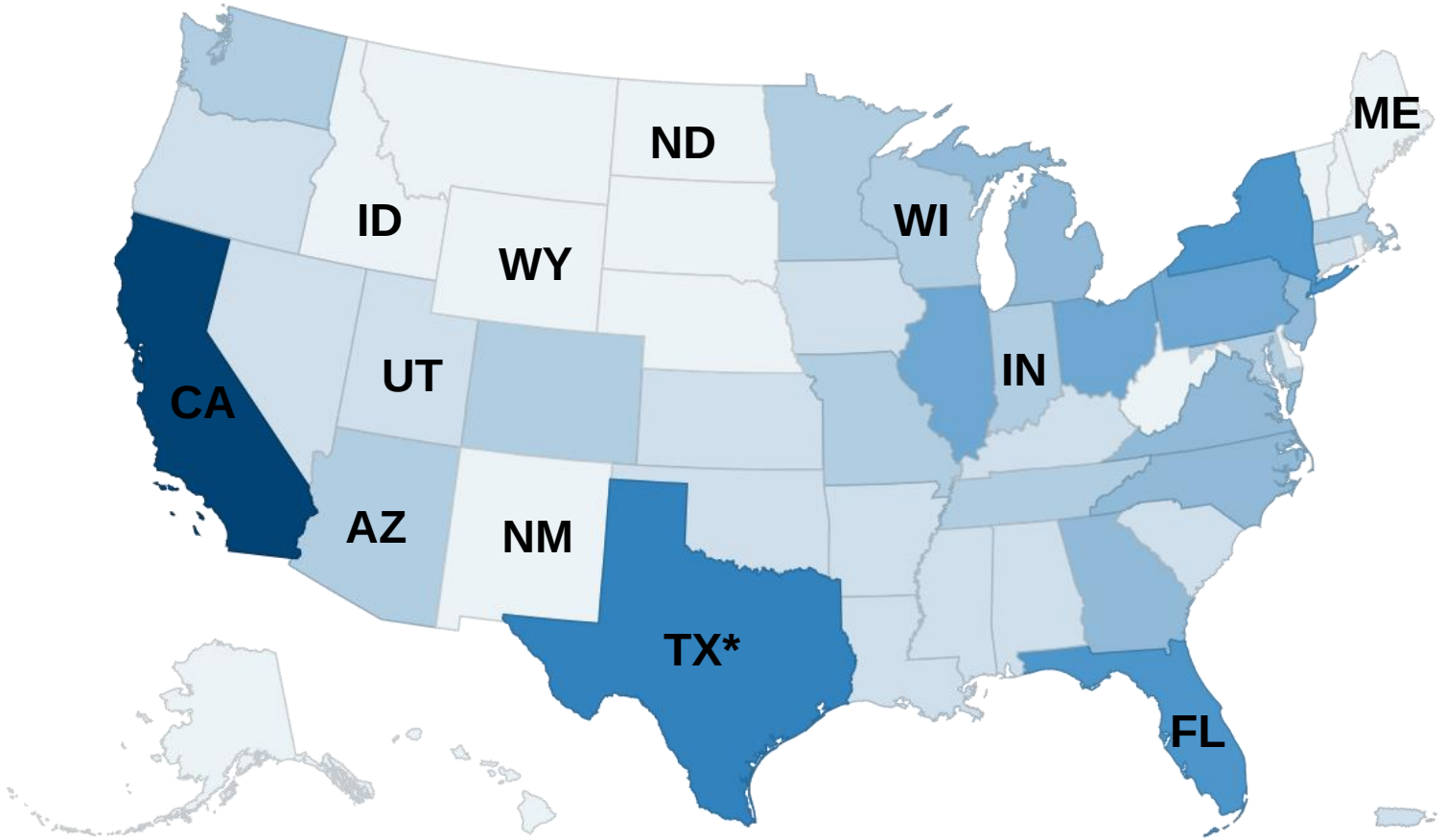
Research Questions

(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)

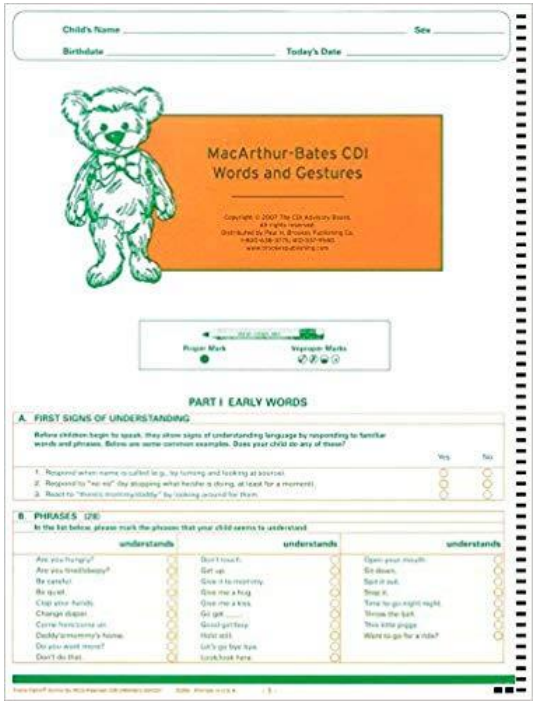
This audiologic information should be released and sent to:

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 any time.

_____ _____
(Signature) (Date)

_____
(Relationship to Child)



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: ____/____/____ Gender of child: ____ Boy ____ Girl
mon day year

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

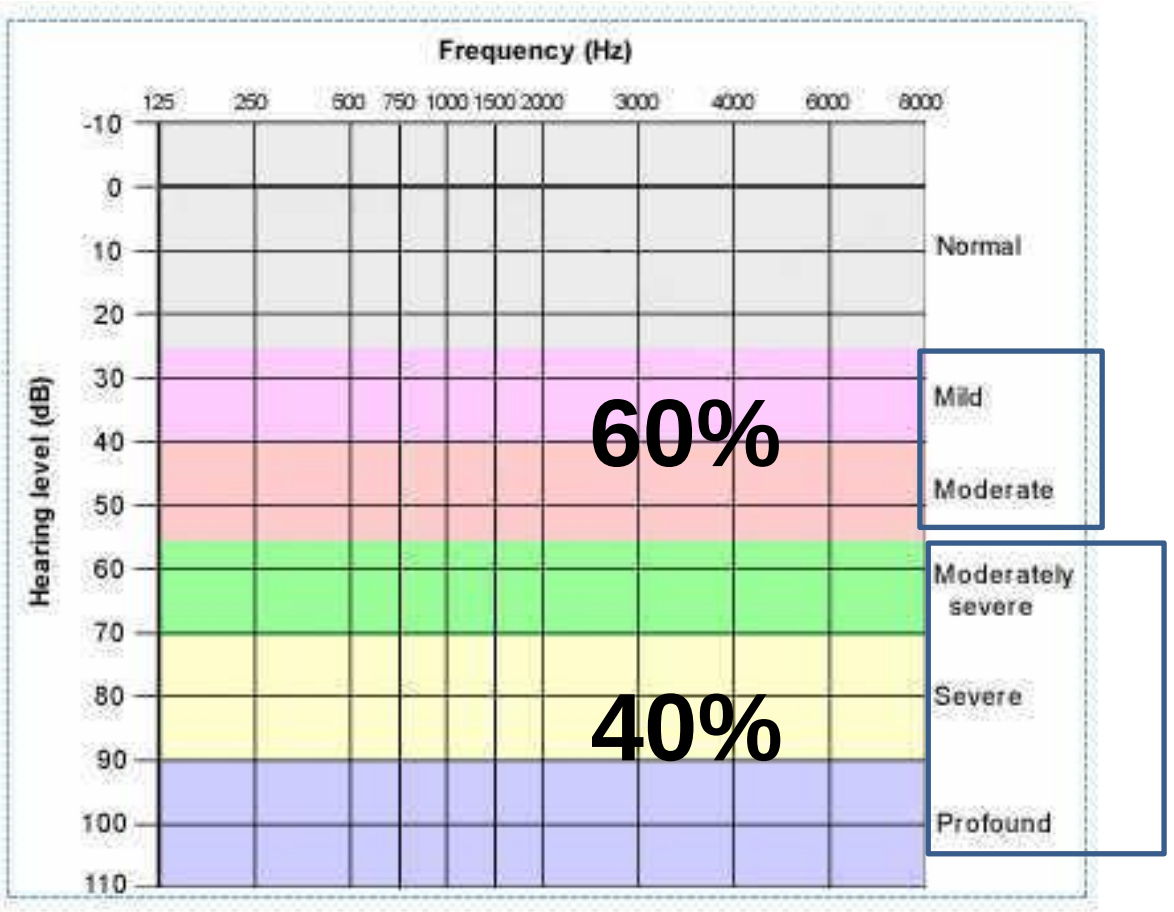
NO ADDITIONAL DISABILITIES

Table 1. Participant and Family Demographic Characteristics

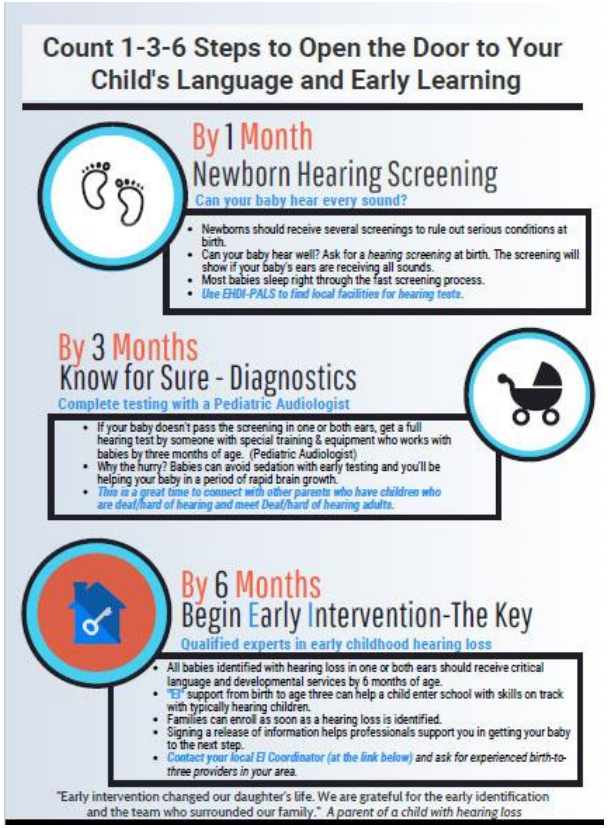
Characteristic	Percentage of Participants
Gender	
Male	46%
Female	54%
Ethnicity	
Non-Hispanic	80%
Hispanic	20%
Race	
White	87%
African American/black	2%
Asian	2%
Native American	1%
Hawaiian/Pacific Islander	1%
Mixed race	7%
Communication mode used with the child	
Primarily spoken language	79%
Spoken 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%

[a]Of the parents who were deaf or hard of hearing, 55% used sign language when communicating with their child.

Participants



Participants

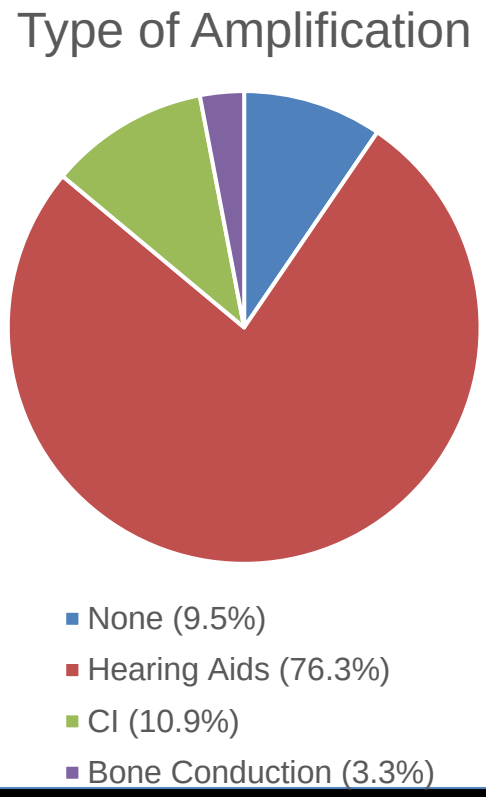


74% Met

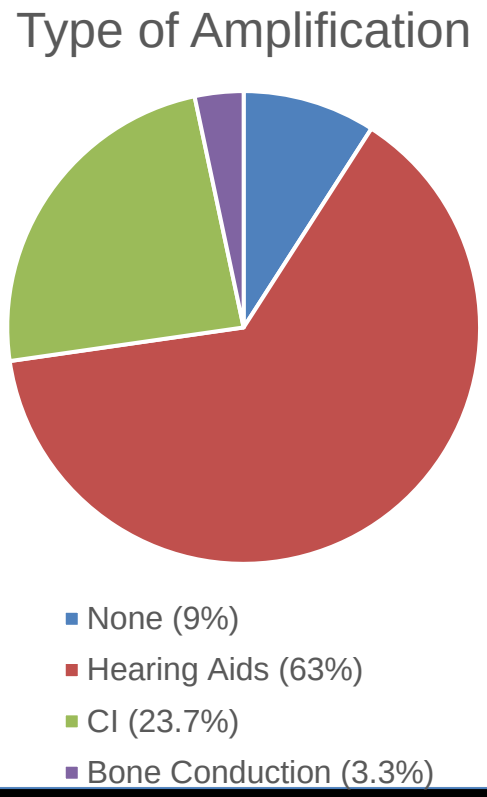
26% Did Not Meet

Participants

1st Assessment

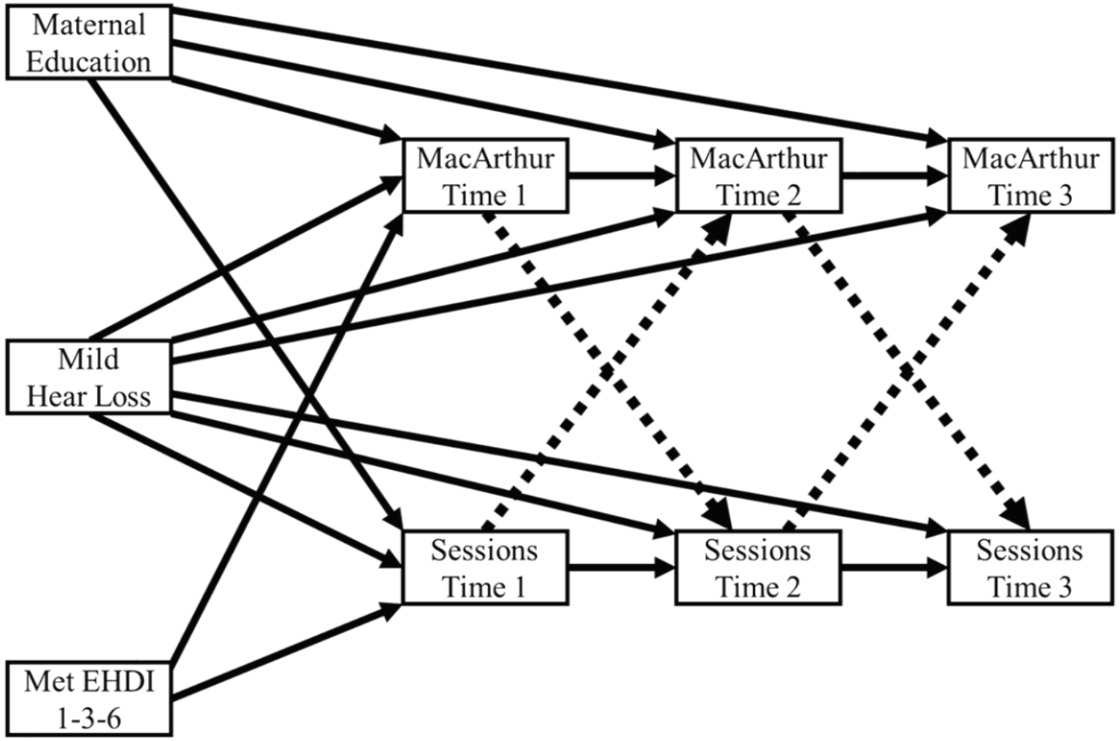


Final Assessment



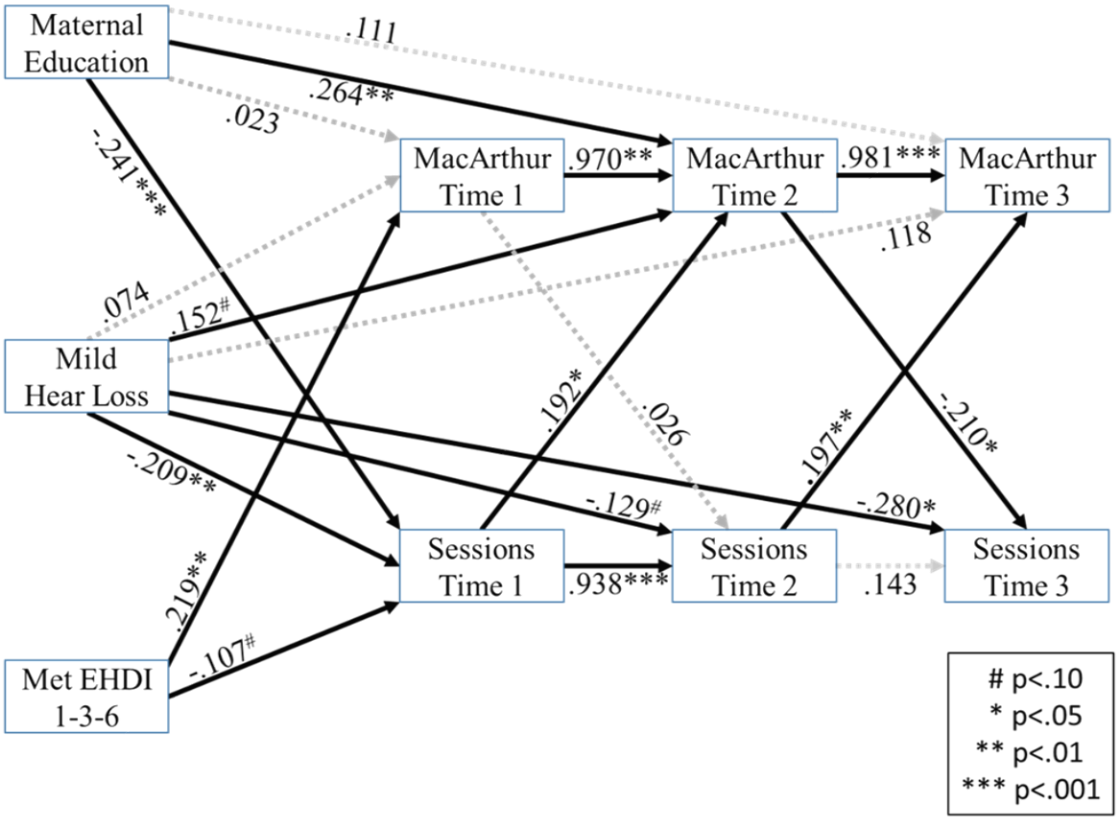
Model

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….

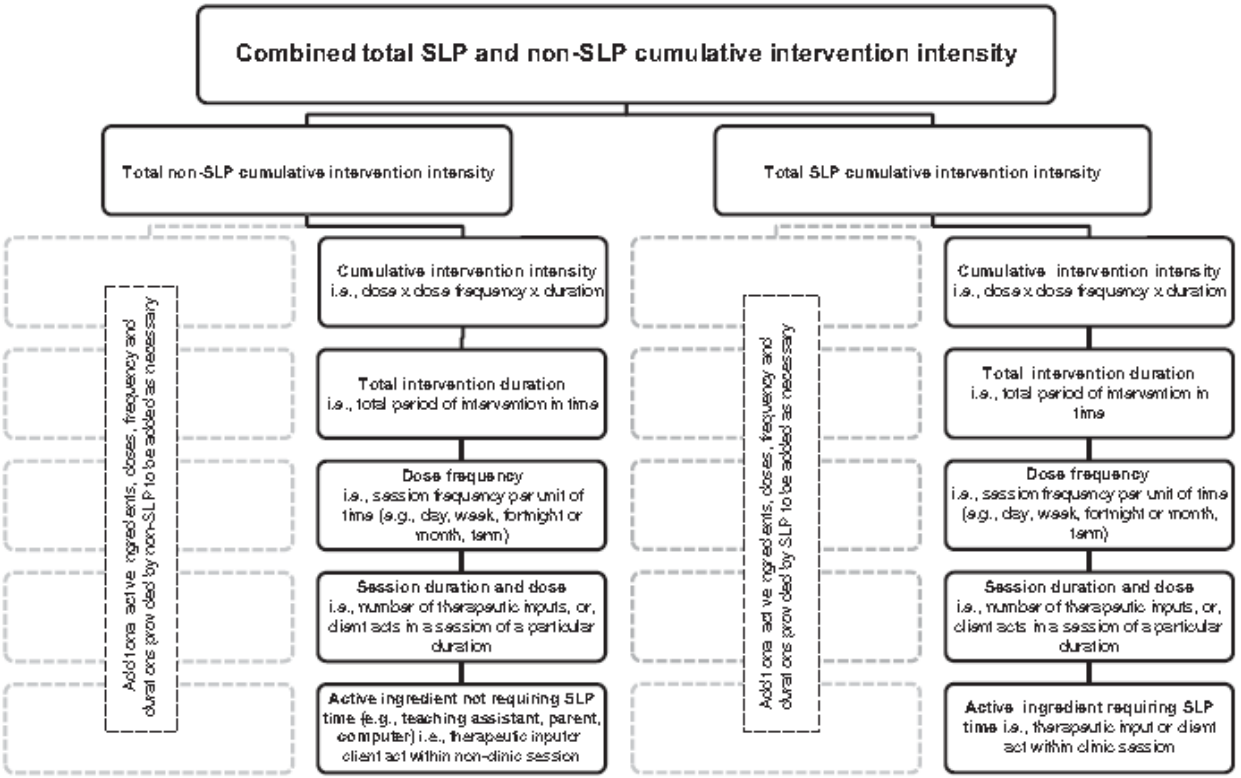


Figure 3. Framework for guiding the measurement of all client acts and/or therapeutic inputs within and beyond sessions, to determine the optimal intervention intensity of speech-language pathology interventions.

Baker, 2012

Thank you for attending!

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