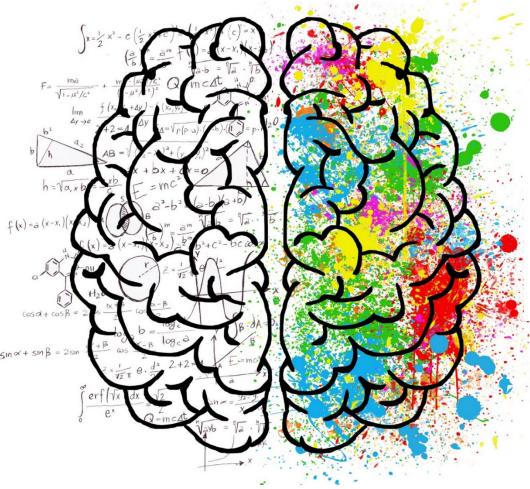# Integration is Key:
Extending the Effects of SLPs' Language Interventions into the Classroom

Causal Connections Between Mathematical Language and Mathematical Knowledge: A Dialogic Reading Intervention

David J. Purpura[a], Amy R. Napoli[a], Elizabeth A. Wehrspann[a], and Zachary S. Gold[a]

Self-regulation and the development of literacy and language achievement from preschool through second grade

Lori E. Skibbe[a,*], Janelle J. Montroy[b], Ryan P. Bowles[a], Frederick J. Morrison[c]

Language Skill and the Development of Social Competence in School-Age Children

Tanya M. Gallagher
McGill University, Montreal, Quebec, Canada

PROVIDING PRESCHOOL FOUNDATIONS FOR LATER READING COMPREH
THE IMPORTANCE OF AND IDEAS FOR TARGETING INFERENCING I
STORYBOOK-SHARING INTERVENTIONS

ANNE VAN KLEECK

Teachers' Language Practices and Academic Outcomes of Preschool Children

David K. Dickinson

School Readiness Skills at K
- Language
- Early Lit
- Math
- Social-E

Outcomes at 3rd & 5th
- Language

Skills

"*Kindergarten language was the only predictor of longitudinal gains both within and across domains.*"

Measuring success: Within and cross-domain predictors of academic and social trajectories in elementary school

Amy Pace [a,*], Rebecca Alper [b], Margaret R. Burchinal [c], Roberta Michnick Golinkoff [d], Kathy Hirsh-Pasek [e]

Language and Writing

Trina D. Spencer, PhD, BCBA-D

University of South Florida
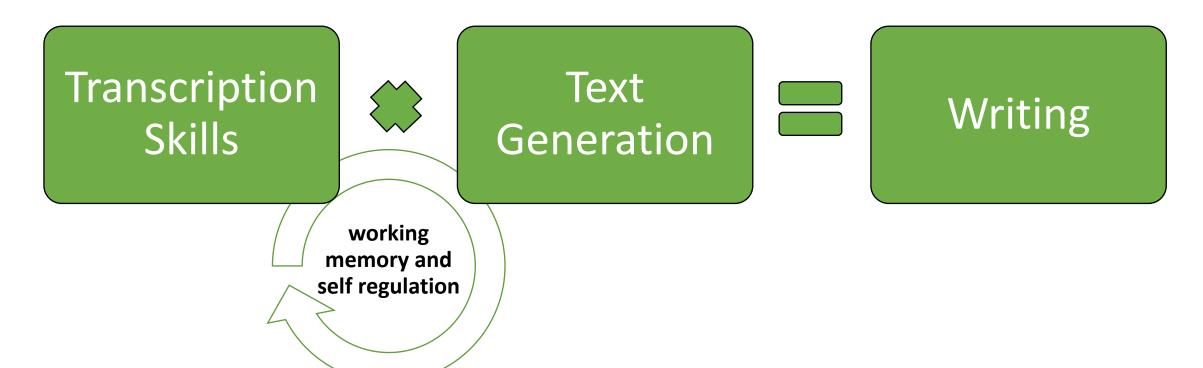
Simple View of Reading

| Word Recognition | × | Language Comprehension | = | Reading Comprehension |

Hoover & Gough, 1990; Catts et al., 2006

Simple View of Writing

Transcription Skills ✖ **Text Generation** = **Writing**

working memory and self regulation

Berninger & Graham, 1998

Text Generation

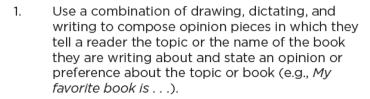IDEATION

think

say

write

Discourse Structure

Sentence Structure
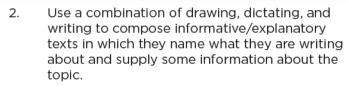
Word Choice
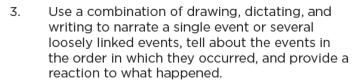
Writing Standards K–5

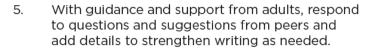## Kindergartners:

Text Types and Purposes

→ 1. Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book (e.g., *My favorite book is . . .*).

→ 2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

→ 3. Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.

Production and Distribution of Writing

4. (Begins in grade 3)

→ 5. With guidance and support from adults, respond to questions and suggestions from peers and add details to strengthen writing as needed.

→ 6. With guidance and support from adults, explore a variety of digital tools to produce and publish writing, including in collaboration with peers.

Research to Build and Present Knowledge

→ 7. Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).

→ 8. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

Language Standards K–5

Kindergartners:

Conventions of Standard English

1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

→ a. Print many upper- and lowercase letters.

→ b. Use frequently occurring nouns and verbs.

→ c. Form regular plural nouns orally by adding /s/ or /es/ (e.g., *dog, dogs*; *wish, wishes*).

→ d. Understand and use question words (interrogatives) (e.g., *who, what, where, when, why, how*).

→ e. Use the most frequently occurring prepositions (e.g., *to, from, in, out, on, off, for, of, by, with*).

→ f. Produce and expand complete sentences in shared language activities.

2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

→ a. Capitalize the first word in a sentence and the pronoun *I*.

→ b. Recognize and name end punctuation.

→ c. Write a letter or letters for most consonant and short-vowel sounds (phonemes).

→ d. Spell simple words phonetically, drawing on knowledge of sound-letter relationships.

→ Text Generation   → Transcription

✓ The majority of intervention studies related to early writing have addressed transcription skills (Graham et al., 2012; Datchuk & Kubina, 2012; McMaster et al., 2017).

However…

✓ Written composition (integration of transcription and text generation) is positively impacted by interventions that integrate discourse structures, syntax, and vocabulary (Datchuk & Kubina, 2012; Silverman et al., 2015)…all of which are malleable via oral modalities.

Research Article

Bridging Oral and Written Language: An Oral Narrative Language Intervention Study With Writing Outcomes
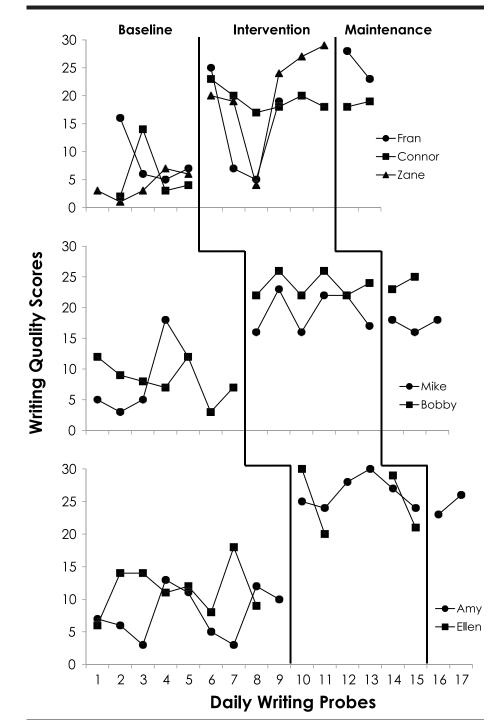
Trina D. Spencer[a] and Douglas B. Petersen[a,b]

Purpose: Despite literature showing a correlation between oral language and written language ability, there is little evidence documenting a causal connection between oral and written language skills. The current study examines the extent to which oral language instruction using narratives impacts students' writing skills.

Method: Following multiple baseline design conventions to minimize threats to internal validity, 3 groups of 1st-grade students were exposed to staggered baseline, intervention, and maintenance conditions. During the intervention condition, groups received 6 sessions of small-group oral narrative instruction over 2 weeks. Separated in the school day from the instruction, students wrote their own stories, forming the dependent variable across baseline, intervention,

and maintenance conditions. Written stories were analyzed for story structure and language complexity using a narrative scoring flow chart based on current academic standards.

Results: Corresponding to the onset of oral narrative instruction, all but 1 student showed meaningful improvements in story writing. All 4 students, for whom improvements were observed and maintenance data were available, continued to produce written narratives above baseline levels once the instruction was withdrawn.

Conclusions: Results suggest that narrative instruction delivered exclusively in an oral modality had a positive effect on students' writing. Implications include the efficiency and inclusiveness of oral language instruction to improve writing quality, especially for young students.

Oral language instruction led to improvements in writing for typical first graders.
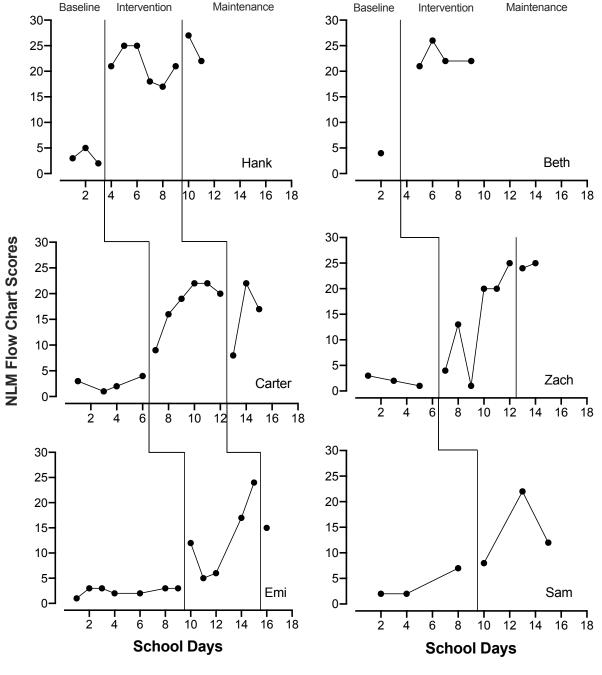
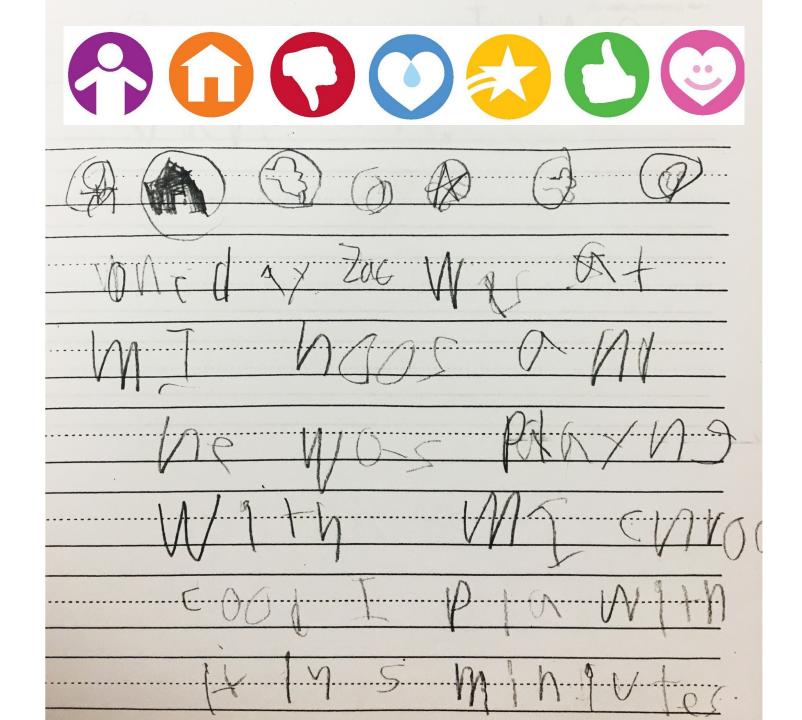Figure 1. Multiple Baseline Design Across Three Groups Results

Recommendation: Narrative Intervention

- Children naturally acquire (or can easily be taught) a schema for stories because...
    - We live our lives in stories
    - It is reflected in our thinking
    - It is pervasive in our cultures

- While children tell and retell stories, they are practicing (and you are modeling and facilitating) the discourse structure, syntax, and vocabulary.

- The discourse structures, syntax, and vocabulary taught through oral language transfers readily to writing.

INTERVENTION STORY

Schema facilitated transfer across modalities

Fran

BEFORE

Once upon a time tere was a gril name o o was gon she went too the city
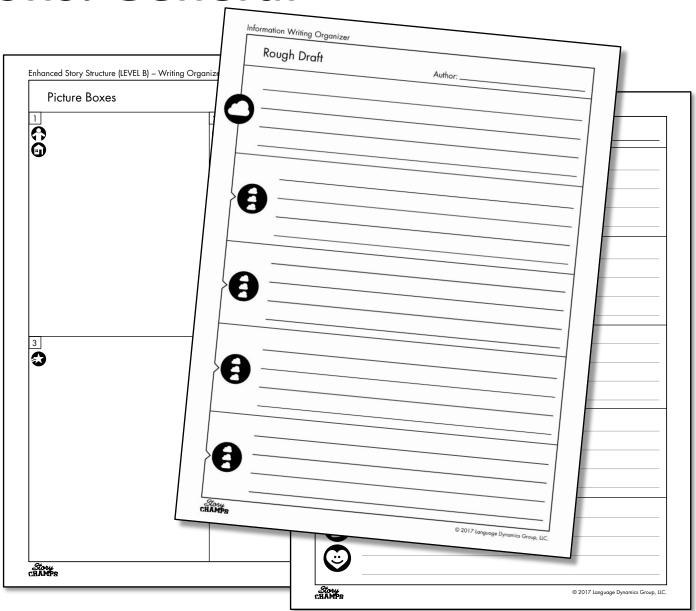
AFTER

When I was playing in my Room I Lost my bear I telled my perints I seid can you find my bear they found it and I was happy.
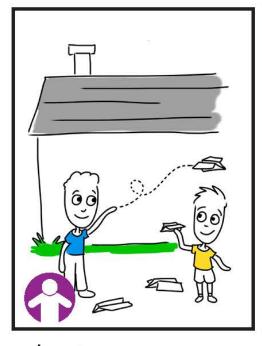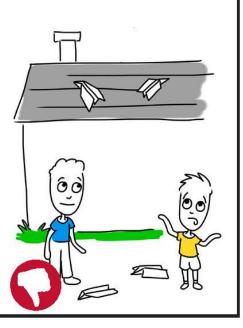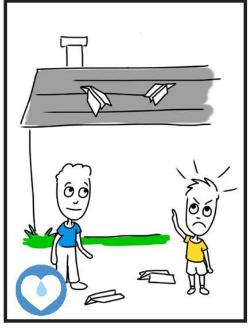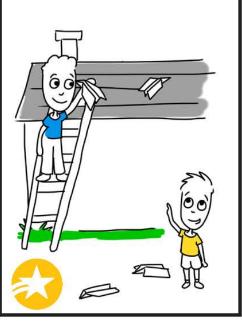
🍏 Recommendations: General

- Graphic organizers

- Draw and dictate

- Turn, talk, write

- Hear-say retells
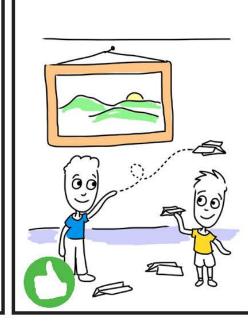
- Hear-write retells

- Narrative ▶ informational

Information Writing Organizer

Rough Draft

Author: _____

Enhanced Story Structure (LEVEL B) – Writing Organizer

Picture Boxes

1

3

STORY CHAMPS

© 2017 Language Dynamics Group, LLC.

Last summer, Harry was playing outside with his cousin.

They were **tossing many** paper airplanes in the air. A **few** planes landed on the **roof** of the house.

Harry was angry because a **few** of his planes were stuck.

Then Harry said, "Please get the airplanes because I'm too **weak** to climb up there." His strong cousin climbed a ladder and got them down.

When Harry and his cousin went in the house, they happily **tossed** their **many** planes again.

The Role of Language in Mathematics

Matthew E. Foster

University of South Florida

Individual and Societal Benefits

Pre-K & Kindergarten Math → High School Academic Outcomes → Employment Success → Benefits Society

Duncan et al. (2007)
Sarama & Clements (2009)

Parsons & Bynner (2005);
Rose & Betts (2004)

Butterworth et al. (2011)
Gross et al. (2009)

Head Start Early Learning Math Goals – Numeracy

1. Know the number names and the count sequence from 1 to 20

2. Recognize the number of objects in a small set (i.e., subitizing)

3. Understand the relationship between numbers and quantities

4. Compare numbers

5. Associate a quantity with written numerals up to 5 and begin writing numerals

6. Understand that addition is 'adding to' and subtraction is 'taking away from something'

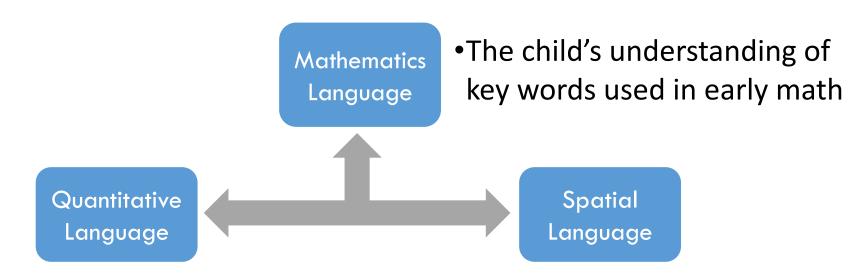# Head Start Early Learning Math Goals – Measurement & Geometry

7. Understand simple patterns

8. Measures objects by their various attributes (e.g., use snap cubes to see how tall a book is)

9. Identifies, describes, compares, and composes shapes

10. Explores the positions of objects in space

Why is Language Important to Mathematics?

Language Ability → **Mathematics Learning**

1. Language helps children refine their understanding of math (Miura & Okamto, 2003; Spelke, 2003)

2. Language is the medium of classroom instruction (Foster et al., 2015)

3. Language is one of the strongest predictors of math success (LeFevre et al., 2010; Purpura et al., 2011; Foster et al., 2015; 2019)

4. Publications on math policies emphasize the need to include math language in curricula and instructional activities (NCTM, 2006)

Types of Mathematics Language

Mathematics Language

- The child's understanding of key words used in early math
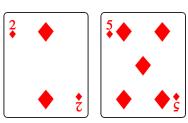
Quantitative Language

Spatial Language

- Quantitative language/terms: more than, less than, many, fewer
- Understanding quantitative language allows children to make & describe comparisons between groups or numbers

- Spatial language/terms: before, above, near
- Understanding spatial language allows children to talk about relationships between physical objects & between numbers on a number line

Recommendations: Games

- Attainment of most preschool math goals can be fostered by playing games
  - **Board Games**: Chutes and Ladders help children recognize written numbers on spaces and spinners, and can help children see which of two numbers is bigger
  - **Card Games**: Help children recognize written numbers and counting, and quantity comparison (e.g., the 5 of diamonds has 3 more diamonds than the 2 of diamonds)
  - **Other Games**: Play games (e.g., dice) to help you talk about collections of objects and help children associate quantity with number words (e.g., three), objects (e.g., three toys), and Arabic numerals (i.e., 3)

Recommendations: Language

- Speak with children about shape, size, and quantity
  - Use a variety of vocabulary words such as corner, oval, narrow, enormous, heavier, shrink, inch, and exactly
- Speak with children about space and time, order and sequence, patterns and relationships
  - Use a variety of vocabulary words such as first, predict, tomorrow, Tuesday, above, below, near

Recommendations: Shared Storybook Reading

- Identify quantitative and/or spatial vocabulary and concepts within math-based storybooks

- Use a series of questions and prompts and scaffolding to elicit verbal responses from children to foster their learning of target vocabulary and concepts

- Ask children low demand (e.g., describe the story while focusing on math language) and high demand (e.g., explaining the meaning of a word, making predictions, or relating a story element to personal experience) questions

Mathematics and Language Summary
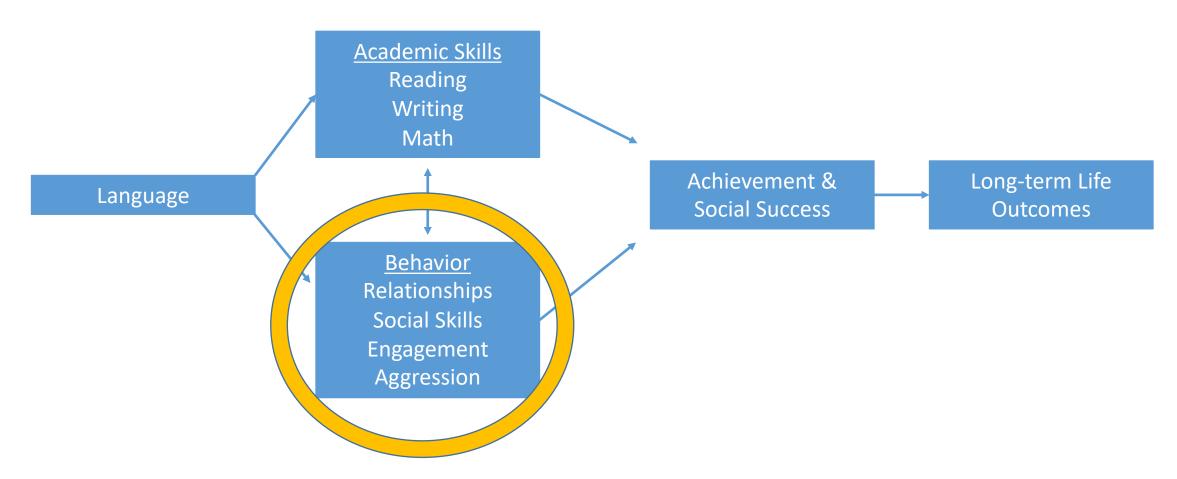
1. Early mathematics is important!

2. Language and in particular, mathematical language is important!

3. Games, authentic conversations, and shared storybook reading can foster the development of mathematical language and in turn, knowledge of mathematics.

The Role of Language in Social Emotional Development

Kathleen Artman Meeker

University of Washington

Central Role of Language

Chow, J. C., & Wehby,, J. H. (2018). Associations between language and problem behavior: A systematic review and correlational meta-analysis. *Educational Psychology Review, 30*, 61-82.

Language & Social Emotional Development are Interconnected

Early Learning Experiences are Essential

REVIEW ARTICLE

Associations Between Language and Problem Behavior: a Systematic Review and Correlational Meta-analysis

Jason C. Chow [1] · Joseph H. Wehby [2]

Contents lists available at ScienceDirect

Early Childhood Research Quarterly

ELSEVIER

High-quality early education: Age of entry and time in care differences in student outcomes for English-only and dual language learners

Noreen Yazejian [a,*], Donna Bryant [a], Karen Freel [b,1], Margaret Burchinal [a], the Educare Learning Network (ELN) Investigative Team

[a] Frank Porter Graham Child Development Institute, University of North Carolina at Chapel Hill, CB #8180, 105 Smith Level Rd, Chapel Hill, NC 27599-8180, United States
[b] Ounce of Prevention Fund, 33 West Monroe Street, Chicago, IL 60603, United States

JSLHR

Research Article

Early Risk Factors and Emotional Difficulties in Children at Risk of Developmental Language Disorder: A Population Cohort Study

Michelle C. St Clair, [a] Claire L. Forrest, [a,b] Shaun Goh Kok Yew, [c] and Jenny L. Gibson [d]
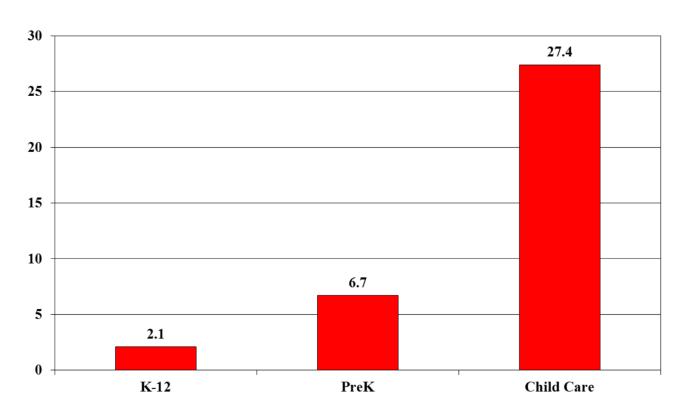
Behavior as a Barrier to Access

Expulsion Rates (per 1,000)

Gilliam, WS & Shahar, G (2006). Preschool and child care expulsion and suspension: Rates and predictors in one state. *Infants and Young Children, 19,* 228-245.

Gilliam, WS (2005). Prekindergarteners left behind: Expulsion Rates in state prekindergarten programs. *FCD Policy Brief, Series No. 3.* Available: www.ziglercenter.yale.edu/publications/briefs.html

US Department of Education
Office of Civil Rights (2014)

Promoting Social-Emotional Language & Behavior

Emotional Literacy	Friendship Skills	Social Problem-Solving

☐ Identify emotions

☐ Express emotions

☐ Language to regulate emotions

☐ Organize play

☐ Share

☐ Assist others

☐ Recognize problems

☐ Generate solutions

☐ Evaluate solutions

Recommendations: Emotion Games & Books

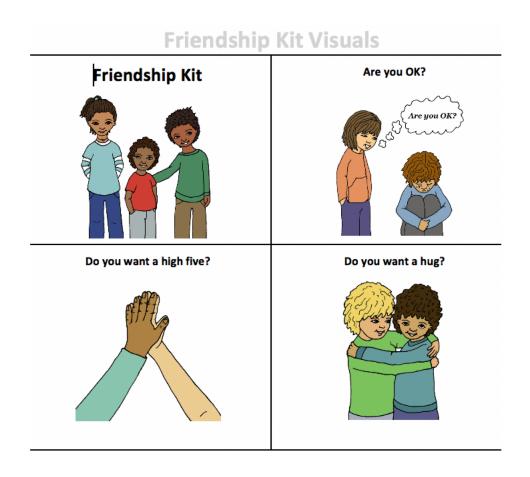# Recommendations: Integrate with Math & Literacy

- Turn Taking ("My turn" & "Your turn")

- Collaboration ("Work together to catch the fireflies")
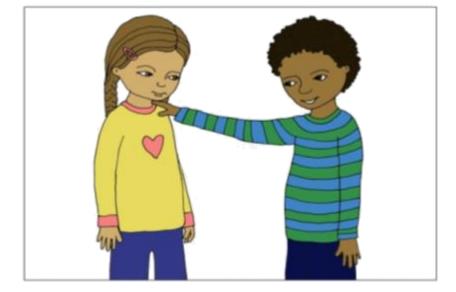
- Problem Solving ("Monster has a problem!")

Recommendations: Visual Supports for Language around Emotions & Behavior
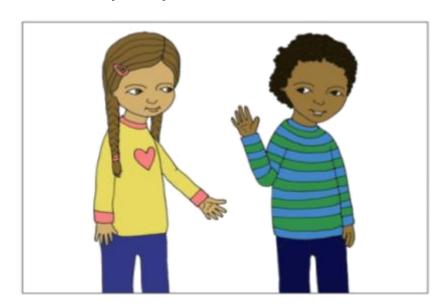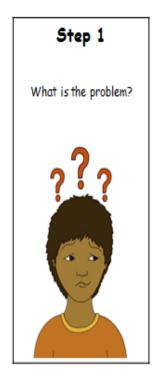
Visuals: Social Interactions

Friendship Kit Visuals

Friendship Kit

Are you OK?

Do you want a high five?

Do you want a hug?

I can tap my friend on the shoulder.

I can say "let's play!"

http://depts.washington.edu/hscenter/
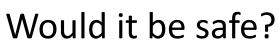
Visuals: Problem-Solving

Wait and take turns.

Step 1	Step 2	Step 3	Step 4
What is the problem?	Think, think, think of some solutions.	What would happen if we tried each solution? Would it be safe? Would it be fair? How would everyone feel?	Give the solution a try!

Get an Adult

Would it be safe?

Would it be fair?

How would everyone feel?
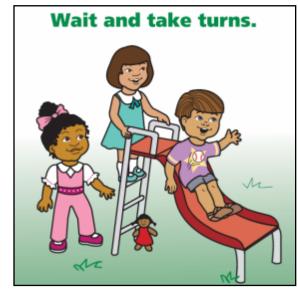
CSEFEL (2015). www.vanderbilt.edu/csefel

Recommendations: Interactions

- Create opportunities for children to interact
- Position children intentionally to nurture interactions
- Remind to use names and/or physical contact
- Label the emotions you see and feel
- If child gets no response, remind to try and try again
- Remind to "play together"
- Give children words/phrases to say
- Model with other adults
- Provide feedback ("You solved the problem!", "You worked together and look so happy!")

Dual Language Learners

Dual Language Learners (DLLs)

- Young dual language learners are one of the fastest growing populations in the US making up about 30% of the population of children ages 0-5 in the U.S.

- About 70% of DLLs speak Spanish, but over 300 languages are spoken by children in the US

- In the last decade there has been increasing interest in improving the educational outcomes of DLLs by federal agencies, national early childhood organizations such as DEC and NAEYC, and prominent philanthropic foundations as evidenced by multiple reports on recommended practices.

The Answer…

Para nuestros niños

National Task Force on Early Childhood Education for Hispanics

La Comisión Nacional para la Educación de la Niñez Hispana

REPORT TO CONGRESS ON DUAL LANGUAGE LEARNERS IN HEAD START AND EARLY HEAD START PROGRAMS

Administration for Children and Families
U.S. Department of Health and Human Services
Washington, D.C. 20447

IMMIGRANT PARENTS AND EARLY CHILDHOOD PROGRAMS
Addressing Barriers of Literacy, Culture, and Systems Knowledge

Maki Park and Margie McHugh

June 2014
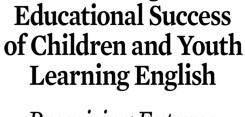
Technical Report

Provision of Instruction in English as a Second Language by Speech-Language Pathologists in School Settings

ASHA Multicultural Issues Board

About this Document

Members of the Multicultural Issues Board who participated in the writing of this document are Lynda Campbell (Chair, 1995–1996), Juanita Sims Doty (Chair, 1997-present), Lisa Alford, Ilene Clingmon, Brian Goldstein, Hortencia Kayser, Gloria Martin, Pauline Mashima, Maurice Mendel, Emma Muñoz, Catharine Nagayda (NSSLHA Representative), Celeste Roseberry-McKibbin, Bryan Scott, Diane Scott (ex-officio, 1993–1996), Vicki R. Deal-Williams (ex-officio, 1997-present), Christine Vining, Toya Wyatt, Vic S. Gladstone (Monitoring Vice President, 1993–1995), L. Gay Ratcliff (Monitoring Vice President, 1996-present).

Promoting the Educational Success of Children and Youth Learning English

Promising Futures

Committee on Fostering School Success for English Learners: Toward New Directions in Policy, Practice, and Research

Ruby Takanishi and Suzanne Le Menestrel, *Editors*

Board on Children, Youth, and Families
and
Board on Science Education

Division of Behavioral and Social Sciences and Education
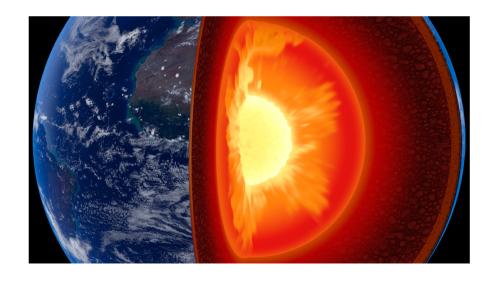
Health and Medicine Division

A Consensus Study Report of

The National Academies of
SCIENCES · ENGINEERING · MEDICINE

Dual Language Learner Teacher Competencies (DLLTC) Report

Winter 2012

IN COLLABORATION WITH NCLR

Alliance for A Better Community

MPI MIGRATION POLICY INSTITUTE

Language is at the core

- At the core of the recommendations is supporting both the home and English language development of DLLs through systematic and targeted language scaffolding

- Accurate measurement/estimation of children's English language proficiency is also important to understanding how to adapt English language intervention

DEC Recommended Practices Assessment
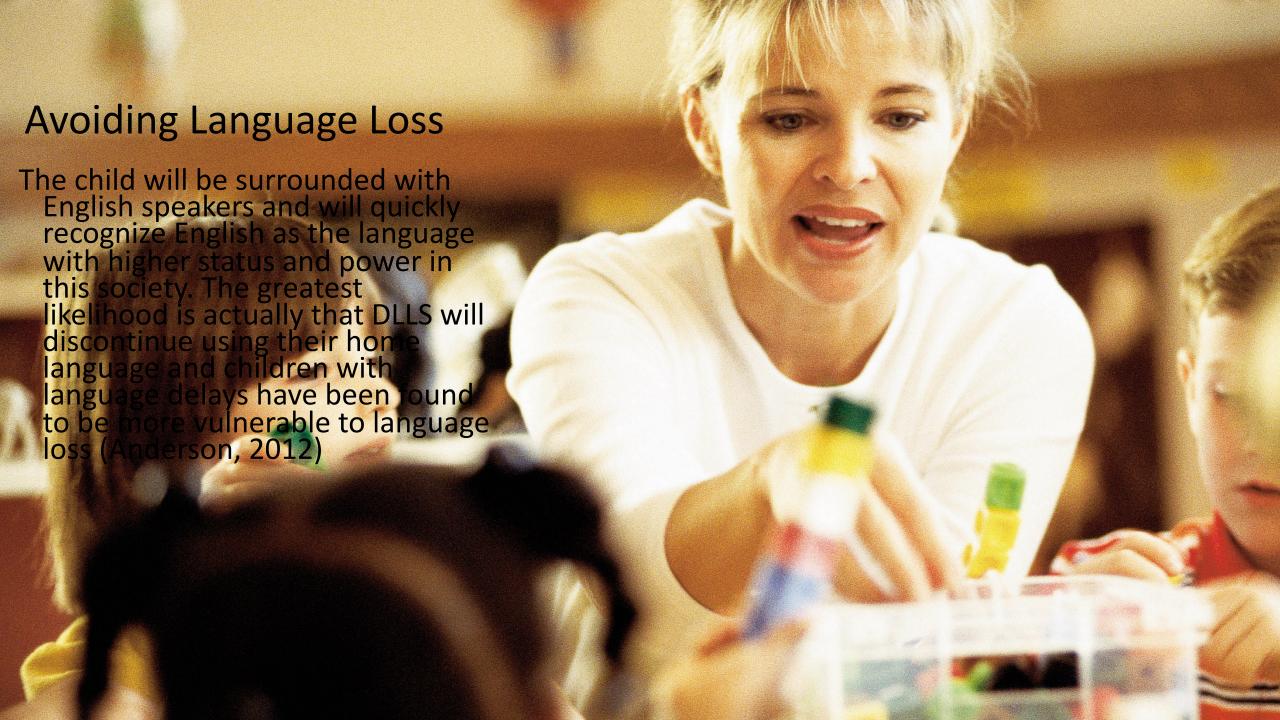
- A3. Practitioners use assessment materials and strategies that are appropriate for the child's age and level of development and accommodate the child's sensory, physical, communication, cultural, linguistic, social, and emotional characteristics.

- A5. Practitioners conduct assessments in the child's dominant language and in additional languages if the child is learning more than one language.

- A8. Practitioners use clinical reasoning in addition to assessment results to identify the child's current levels of functioning and to determine the child's eligibility and plan for instruction.

Division for Early Childhood

Recommended Practices

DEC Recommended Practices Instruction

- INS5. Practitioners embed instruction within and across routines, activities, and environments to provide contextually relevant learning opportunities.

- INS11. Practitioners provide instructional support for young children with disabilities who are dual language learners to assist them in learning English and in continuing to develop skills through the use of their home language.

- INS12. Practitioners use and adapt specific instructional strategies that are effective for dual language learners when teaching English to children with disabilities.

- *INS13*. Practitioners use coaching or consultation strategies with primary caregivers or other adults to facilitate positive adult-child interactions and instruction intentionally designed to promote child learning and development.

Division for Early Childhood

Recommended Practices

Avoiding Language Loss

The child will be surrounded with English speakers and will quickly recognize English as the language with higher status and power in this society. The greatest likelihood is actually that DLLS will discontinue using their home language and children with language delays have been found to be more vulnerable to language loss (Anderson, 2012)

Misconceptions about DLLs with disabilities

A child's ability to learn any language is constrained by their cognitive level and/or level of language impairment. However, research has shown that individuals with disabilities can learn more than one language and learning two languages is not inherently more difficult than learning one language (Cheatham et al., 2012; Lund, Kohlmeier, & Durán, 2017)

Supporting Healthy Family Connections

The child must be able to communicate with his/her family and community so that he/she does not become socially isolated. Maintaining strong home language skills will allow parents to communicate affection, discipline and teach cultural values (Wong-Fillmore, 1991).

Evidence-based Recommendations

- Support families in implementing storybook activities in their home language and continuing to use their home language

- Use supplemental language and early literacy curricula such as VOLAR or Literacy Express in small groups to support language and early literacy growth

- Use the child's home language in addition to English in Intervention

Bilingual and Home Language Interventions With Young Dual Language Learners: A Research Synthesis

Lillian K. Durán,[a] Daphne Hartzheim,[b] Emily M. Lund,[c]
Vicki Simonsmeier,[c] and Theresa L. Kohlmeier[c]

Purpose: The purpose of this systematic review was to determine what bilingual or home language interventions have been found to be effective for 2- to 6-year-old dual language learners who have language impairment (LI) or are at risk for LI.

Method: We conducted ancestral searches and searches of electronic databases, hand-searched article bibliographies, and searched 19 journals for experimental, quasiexperimental, or single-subject studies.

Results: The review yielded 26 studies that were coded for quality, frequency and duration of the intervention, number of participants, location of intervention, interventionist, language(s) of intervention, and reported or calculated effect sizes. Studies were grouped by those that focused specifically on at-risk populations and those that focused on children with LI. Emerging trends provide support for bilingual and/or home language interventions for both children with LI and those at risk for LI.

Conclusions: There were relatively few studies that met inclusion criteria, and the average quality rating for a study was 6.8 out of 9.0 possible points. More high-quality research is needed, particularly with populations that speak languages other than Spanish. Clinicians need more evidence-based recommendations to improve the language and literacy outcomes of the diverse range of dual language learners served in the United States and abroad.

SLPs and Leadership with DLLs

- SLPs have the most training on special education teams about language development and they often lead the discussion about language intervention

- SLPs need to bring evidence-based information to the team about bilingual development and recommended practices.

- Families need well informed SLPs to support their ability to maintain communication with their child in their home language

- Supporting language development for DLLs builds the foundation for academic success

Language Goals that Integrate Math

- Increase receptive language skills by following one-step directions that contain one of the following basic concepts:
  - spatial (e.g., *in, out of, on, off,*)
  - quantitative (e.g., *one, some, all, more, less*)
  - temporal (e.g., *before, after, next*)
- Identify and use categories, part-whole relations.
- Compare and contrast objects using descriptive words.
  - *large, smallest, tiny, long, short.*
- Identify and use concept words.
  - *Above, below, beside, more, less, same, different, match, equal, together.*

Language Goals that Integrate Social-Emotional

- Improve play skills and engage with peers
  - engage with other children sharing a common set of materials for at least 5 minutes given adult proximity as needed.
  - initiate with peers and/or respond to peers initiation to play using appropriate means (including verbalizing ideas, saying "no thanks" to reject play, asking for toys/materials, etc.)
  - take up to 2-3 turns with another child in a joint action routine given adult facilitation.
- Increase receptive and expressive language
  - Initiate requests, ask for assistance.
  - Produce words or short, functional phrases to indicate wants and needs (e.g., request, help, indicate "my turn").

What does the research say?

Nearly 59% of children with a language disorder also have a writing disorder.

55% of children with language disabilities can be expected to have a math disability.

55% of young children with developmental language disorder exhibit self-regulation problems at 11.

In second grade, more than half of children with language impairment have reading difficulties and nearly a third have behavior disorders.

Language patterns associated with bilingual acquisition can be confused with language disorder.

Oral language interventions with young children have a direct impact on children's writing quality.

Providing targeted language scaffolding improves educational outcomes for Dual Language Learners.

Social emotional teaching strategies provide opportunities for children to practice important language skills in meaningful ways.

Improving math language also improves math knowledge.

Playing Games

- Following directions
- Taking turns
- Empathy
- Making choices
- Functional language (my turn)
- Basic concepts (more, all, less)

Storytelling

- Temporal words (before, next)
- Descriptive words (higher, long)
- Causal words (because, since)
- Emotion words
- Pragmatic language
- Problem solving

nurture me
ALLIANCE

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