LANGUAGE ACQUISITION

Where does language come from?

• Most children acquire language at a rapid rate without much direct teaching of language. So, how do they learn it?

• Children need to hear language to acquire language.

• Children need to use language to grow their language skills.
**LANGUAGE ACQUISITION**

Where does language come from?

- Two basic natural processes:
  - Fast-mapping (receptive focus)
  - Incidental teaching (expressive focus)

- Instruction (vocabulary and syntax focus)

- To understand the developmental process and how we might frame instructional goals, we need to learn a bit more about what we mean by 'language'.

**DEFINING THE COMPONENTS OF ORAL LANGUAGE**

- **Semantics:** Understanding the meaning of words (vocabulary, synonyms, definitions).

- **Morphology:** Understanding the different variations of words (e.g., suffixes, affixes).
  - A *morpheme* is the minimal meaningful unit of a language.

- **Syntax:** Putting words together to form larger meaning units (e.g., grammar).
  - Use of increasingly complex (longer) phrases and use of correct morphosyntax (e.g., plurals, past tense).

- **Hierarchical** in development (later developing components made possible by earlier components).

**DEFINING THE COMPONENTS OF ORAL LANGUAGE**

- Linguists typically divide oral language into five categories:
  - Phonology
  - **Semantics**
  - Morphology
  - Syntax
  - Pragmatics

**SEMANTIC ACQUISITION**

- Around 18 months, language changes in two ways:
  - (a) Vocabulary growth increases. A typical child begins to learn words at a very fast rate and will keep learning at that rate or faster through adolescence; and
  - (b) primitive syntax begins, with two-word strings.

- Preschool is a time of rapid vocabulary development.
  - A typical 2-1/2-year-old knows ~450 words
  - A typical 3-year-old knows ~1,000 words
  - A typical 5-year-old knows ~5,000 words

- On average, school-age children add 2,000–4,000 words a year to their vocabularies.
COMPREHENSION & PRODUCTION OF SYNTAX

- Both production and comprehension follow a developmental sequence of increased complexity.
- Just like with vocabulary, receptive comprehension of syntax in speech begins earlier and is usually stronger than productive capacity.

LANGUAGE ACQUISITION

- Not all children receive the same high quality and quantity of language and vocabulary input.
- This means children are often very unequal in their language development even by 2 years old (over and above the naturally occurring individual differences in approximate acquisition timelines).

INDIVIDUAL VARIATIONS BEGIN EARLY

- Children have differing types of initial words:
  - Referential focus on object labels
  - Expressive focus on interactions
- Sources of variability: internal
  - Gender
  - Memory skill
  - General cognitive ability
- Sources of variability: external
  - Frequency of input received
  - Timing of input received
  - Type of input received: complexity, expansions, specificity

Syntax Development

- Single words
- Two-word phrases
- 3+ word simple sentences
- Varied sentence structure, wh-questions, negation
- Simple relative clauses
DEVELOPMENTAL CONSEQUENCES

Birth  Preschool  Kindergarten  Elementary  Middle School  High School

High Achieving Children

Low Achieving Children

Closing the Gap

FUTURE RISK

How Does Preschool Oral Language Skill Connect with Later Literacy Skills?...

A Model of the Role of Oral Language in the Development of Reading

FUTURE RISK

- Early vocabulary and language skill is related to future reading and reading comprehension
- Early language limitations can impede further language growth
- Also related to overall academic success, including high school graduation and beyond
**DIRECT ROLE of Oral Language in Reading**

**LANGUAGE ACQUISITION CONSEQUENCES**
- Likely need to be more instructionally proactive to try to accelerate high risk children’s growth and try to catch them up
- May require more intentional and explicit methods than would typically need to use
- But, the earlier the better because the gap may be at its narrowest point

**LANGUAGE INSTRUCTION**
- Children from at-risk backgrounds are already months or years behind average language and vocabulary levels
- Want to fill in the holes, and
- Want to try to teach generalizable content and skills that children can apply in many oral and written language contexts

**DEFINING THE COMPONENTS OF ORAL LANGUAGE**
- **Semantics**: Understanding the meaning of words (vocabulary, synonyms, definitions)
- **Morphology**: Understanding the different variations of words (e.g., suffixes, affixes). A **morpheme** is the minimal meaningful unit of a language
- **Syntax**: Putting words together to form larger meaning units (e.g., grammar)
  - Use of increasingly complex (longer) phrases and sentences
  - Use of correct morphosyntax (e.g., plurals, past tense)
### EXAMPLES OF PRE-K SYNTAX GOALS FROM STATE STANDARDS

- Uses age-appropriate grammar in conversations and increasingly complex phrases and sentences.
- Child typically uses complete sentences of four or more words, usually with subject, verb, and object order.
- Connects phrases and sentences to build ideas.
- Child uses sentences with more than one phrase.
- Child combines more than one idea using complex sentences.
- Child combines sentences that give lots of detail, stick to the topic, and clearly communicate intended meaning.

### CHALLENGES IN SPEECH & PRINT

- "In-between" words that can create potholes in understanding.
  - Conjunctions: Would you like cake or ice cream?
  - Prepositions: The dog hid his bone beneath the tree.
  - Adverbs: Malik slowly stretched his arms.
  - Negation: Do not run into the street.
  - Elaborated phrases: Molly wanted to ride the big, twisty roller coaster.
  - Combinations of these: I want ice cream but not with sprinkles.
  - Complex phrases: Josh reached down for the shaggy dog, whose ears perked up again suddenly as he began to bark.

### INSTRUCTIONAL FOCUS

- Sentence level syntactical features can be roadblocks to listening and reading comprehension, yet.
- Few prior interventions—outside of special education/speech/language clinical work—have focused on these specific syntactical and semantic targets.

### Increasingly complex text

- **Separate sentences**
  - Simple sentence structure
  - Conventional word order
- **Connections with conjunctions**
  - Compound sentence structure
  - Coordinating and subordinating
- **Elaborated sentences**
  - Complex sentence structure
  - Multiple clauses and phrases
LATER COMPREHENSION & WRITING CHALLENGES

- Oral
  - Missed details
  - Incorrect sequences
  - Partial retention

- Written
  - Lack of details
  - Lack of organization
  - Lack of cohesive transitions

INSTRUCTIONAL DESIGN

- Goal was to focus intervention on sentence level syntactical targets in both:
  - **Receptive** (behavioral response and listening comprehension)
  - **Expressive** (productive authentic utterances)
INSTRUCTIONAL DESIGN

- Additional focus on mental state vocabulary and complex complement sentence structure, as linked syntactic-semantic targets that are related to comprehension of academic language
  
  I think that it is raining outside
  
  I know that candy is sweet

INSTRUCTIONAL DESIGN

- 12 weeks of intervention
- 20 minutes per day for 4 days a week, pull-out instruction in small groups of 4 children
- Total of 16 hours of instruction

INSTRUCTIONAL TARGETS

<table>
<thead>
<tr>
<th></th>
<th>Unit 1</th>
<th>Unit 2</th>
<th>Unit 3</th>
<th>Unit 4</th>
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<tbody>
<tr>
<td>First grade</td>
<td>Conjunctions</td>
<td>Passive Structure</td>
<td>Quantifying Adverbs</td>
<td>Elaborated Noun Phrases</td>
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<td>Kindergarten</td>
<td>Prepositional Phrases</td>
<td>Conjunctions</td>
<td>Modal Verbs</td>
<td>Adverbial Phrases</td>
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<tr>
<td>Prekindergarten</td>
<td>Prepositional Phrases</td>
<td>Conjunctions</td>
<td>Adverbial Phrases</td>
<td>Negative Structure</td>
</tr>
</tbody>
</table>

INSTRUCTIONAL CONTEXT

First Question: How do we make Syntax... FUN??!

All grades include Motion-Science concepts as context of stories and activities
PRE-K INSTRUCTIONAL FEATURES

- Explicit instruction in small number of syntactical features per week, with extensive opportunities for practice in multiple contexts
- Model → Receptive → Expressive lesson format with explicit scaffolding
- Highly interactive with two-dimensional images and three-dimensional manipulation of movement props

PRE-KINDERGARTEN UNIT 1

Objective: By the end of the unit, students should be able to:
- Indicate location of prepositions
- Use primary target prepositions appropriately in a sentence
- Understand prepositions that are opposite in meaning (i.e., above and below)
- Correctly repeat back a sentence using a primary target preposition

Primary Targets:
Above, Below, Behind, Between

PRE-KINDERGARTEN UNIT 2

Objective: By the end of the unit, students should be able to:
- Follow directions that include conjunctions to indicate appropriate pictures
- Complete a sentence containing a primary target conjunction
- Use primary target conjunctions appropriately in a sentence
- Correctly repeat back a sentence using a primary target conjunction

Primary Targets:
And, Or, But

In the beginning of the story, Jessica had a choice to make. What were Jessica's two choices?
PRE-KINDERGARTEN UNIT 3

Objective: By the end of the unit, students should be able to:
- Answer questions about how the action in the sentence was completed
- Use adverbial phrases appropriately in a sentence
- Correctly repeat back a sentence using adverbial phrases
- Indicate pictures that are correctly depicting various -ly adverbs

Primary Targets:
- Quickly, Tightly, All, Only

PRE-KINDERGARTEN UNIT 4

Objective: By the end of the unit, students should be able to:
- Indicate pictures that depict where a given action is not happening
- Complete a negative sentence
- Correctly answer a question about what is not true or incorrect in a sentence
- Answer questions about what one should “never” do
- Understand what actions are done always, never or sometimes

Primary Targets:
- Not, Don’t, Can’t, Isn’t, Won’t, Never, Un-

METHOD: OVERVIEW YEAR 1

- Small scale field design studies following a cycle:
  - Design → test → revise → test
  - We did this independently for each of the 4 instructional units, so 8 total trials across the year with preschoolers
  - 64 children participated. Each group of 16 children participated in two of the trials, but not the same unit twice
  - 3 weeks of intervention, Pre- and post-test

DESIGN STUDY

Group A
Unit 1
Unit 3
Group B
Unit 2
Unit 4
Group C
Unit 2R
Unit 4R
Group D
Unit 1R
Unit 3R
**Phillips Tier 2 Language Intervention**

**METHOD: YEAR 1 MEASUREMENT**

- Screening: Listening Comprehension (OWLS), Syntax (CELF-P-2, CASL)
- Pre-Post Measurement
  - Listening Comprehension: stories with embedded syntactical targets and mental state verbs
  - Sentence Level Assessment: receptive and expressive items
  - PPVT-III

**EFFECT SIZES BY TRIAL**

<table>
<thead>
<tr>
<th></th>
<th>Syntax CBM</th>
<th>Listening Comp. CBM</th>
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<tr>
<td>Unit 1 Trial 1</td>
<td>.21</td>
<td>.46</td>
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<tr>
<td>Unit 1 Trial 2</td>
<td>.02*</td>
<td>.30</td>
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<tr>
<td>Unit 2 Trial 1</td>
<td>-.07</td>
<td>.40*</td>
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<tr>
<td>Unit 2 Trial 2</td>
<td>.32</td>
<td>.30</td>
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<td>Unit 3 Trial 1</td>
<td>.79*</td>
<td>.25</td>
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<td>Unit 3 Trial 2</td>
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<td>.32</td>
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<tr>
<td>Unit 4 Trial 1</td>
<td>.86</td>
<td>.59*</td>
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<tr>
<td>Unit 4 Trial 2</td>
<td>.30</td>
<td>.02</td>
</tr>
</tbody>
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**METHOD: OVERVIEW YEAR 2**

- Instruction on syntactical targets and mental state verbs
- 82 Pre-K children
- Children screened-in on CELF, CASL subtests
- Pre-, mid-, and post-test
- Interventionists: Researcher trained, experienced teachers

**METHOD: OVERVIEW**

- Recruited from 11 schools in two cities in north Florida
- Children were screened on CELF Concepts & Following Directions and CASL Syntax Construction
- Qualifying Children scored at or below the 50th percentile on one or both measures
METHOD: PRE-POST ASSESSMENTS

- CELF: Sentence Structure
- OWLS: Listening Comprehension
- WJ: Picture Vocabulary
- Curriculum-Based Syntax Measures: receptive and expressive items
- Curriculum-Based Listening Comprehension: constructed passages with embedded syntactical targets and mental state verbs (a “distal” measure)

PRETEST BY CONDITION

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Treatment</th>
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<tbody>
<tr>
<td>Syntax CBM</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>9.26 (2.81)</td>
<td>10.69 (3.80)</td>
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<tr>
<td>Listening Comp. CBM 1</td>
<td>0.76 (0.83)</td>
<td>1.26 (1.09)</td>
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<td>Listening Comp. CBM 2</td>
<td>0.51 (0.66)</td>
<td>0.63 (0.62)</td>
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<tr>
<td>CELF-P2 Sentence Structure</td>
<td>20.49 (3.32)</td>
<td>22.00 (3.06)</td>
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<tr>
<td>OWLS-LC</td>
<td>23.07 (8.11)</td>
<td>27.04 (10.69)</td>
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<tr>
<td>WJ- Picture Vocabulary</td>
<td>11.85 (2.49)</td>
<td>13.46 (2.56)</td>
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</table>

ADJUSTED POST-TESTS

<table>
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<tr>
<th></th>
<th>Control</th>
<th>Treatment</th>
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<th>Effect Size</th>
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<tbody>
<tr>
<td>Syntax CBM</td>
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<td>Adj. Mean (SD)</td>
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<td>11.57 (3.59)</td>
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<tr>
<td>CELF-P2 Sentence Structure</td>
<td>13.34 (3.19)</td>
<td>14.87 (4.09)</td>
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<td>OWLS-LC</td>
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<td>30.31 (10.28)</td>
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<tr>
<td>WJ- Picture Vocabulary</td>
<td>14.92 (2.50)</td>
<td>13.86 (2.06)</td>
<td>&gt;.10</td>
<td>0.19</td>
</tr>
</tbody>
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METHOD: PARTICIPANTS: PRE-K

- Screened 120 children from 5 schools, 10 classrooms, Title 1 public pre-K

- Qualifying Subgroup: 45% Female; 74.4% African American, 18.3% White, 7.3% other

- Qualifying Screening Scores:
  - Range from 2-11 for Scaled Scores on CELF-P2-CFD and from 61-99 Standard Scores on the CASL-SC
  - CELF-P2-CFD mean = 6.27, SD = 2.11
  - CASL-SC mean = 80.81, SD = 9.18
DISCUSSION

- Strong impacts on curriculum-linked syntax and listening comprehension

- Although not significant, moderate, meaningful effect sizes for standardized test of syntax and promising findings for listening comprehension

- Suggests need to increase intensity of dose?

- Very promising initial data for the intervention