The Effect of Lexical Representations on Morphosyntax in Preschool Children

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Grammatical Development
- Morphosyntax: Subset of grammatical morphemes that marks tense and agreement
- Typically developing preschoolers optionally omit tense and agreement morphemes: “Optional Infinitive Stage” (Rice et al., 1998; Wexler, 1994, 1996)
- Lexical Verbs:
  - Third Person Singular: “Everyday she dance vs. She dances”
  - Past Tense: “Yesterday she dance vs. She danced”
- Copula and Auxiliary Be/Do Verb Forms:
  - “*She ___ dancing vs. She is dancing”
  - “*She ___ nice vs. She is nice”
  - “*Do she dance? vs. Does she dance?”

Optional Infinitive Stage cont.
- Optional omission represents incomplete/emerging knowledge (Wexler, 1994)
- Optional omission of tense markers is resolved between 3- and 5-years in typical language learners
- Are there linguistic factors outside of the morphosyntactic domain that predict the optional omission of tense and agreement morphemes?

Grammatical Morphology & the Lexicon
- Lexical Size & Grammatical Morphology
  - The relationship between the size of the lexicon and growth in grammatical morphology has not been consistently observed (e.g., Marchman & Bates, 1994; McGregor et al., 2005; Moyle et al., 2007; but see Hadley & Holt, 2006; Rice et al., 2006)
- Lexical Representations & Grammatical Morphology?

Lexical Representations
- Neighborhood Density:
  - The number of similar sounding words based on a one sound substitution, addition, or deletion (Dense vs. Sparse; Luce & Pisoni, 1998)
  - e.g., Neighbors of the word “kick” include “lick” “kiss” “click”
  - Dense → kick
  - Sparse → move
- Dense words have more complete/stable representations than sparse words (e.g., Storkel, 2002; Metsala & Walley, 1998)
Neighborhood Density & Normal Language Development

• Children’s early vocabularies consist of more dense, than sparse words (Storkel, 2004)
• Children learn dense words better than sparse words (e.g., Storkel, 2001, 2003)
• Dense words facilitate sound production (e.g., Gierut et al., 1999; Lee & Storkel, 2008; Morrisette & Gierut, 2002)
• The effect of neighborhood density on morphosyntax production has not been examined

Research Question

• Are certain verbs more vulnerable to optional omission of morphosyntactic forms than others?
  » Do lexical representations influence the production of morphosyntax by typically developing children in the OI stage.
  » Third person singular accuracy in two morphosyntax production tasks:
    » Sentence Imitation
    » Spontaneous Elicitation

Participants

<table>
<thead>
<tr>
<th>Children with Typical Development (n = 16)</th>
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<tr>
<td>6 boys, 10 girls</td>
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<td>Chronological Age (months)</td>
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<td>39 (35-47)</td>
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<td>Receptive Vocabulary (PPVT-4 Standard Score)</td>
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<td>114 (96-138)</td>
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<td>Third Person Singular Accuracy (TEGI)</td>
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<td>47% (13-78)</td>
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</tbody>
</table>

- All children were native English speakers
- All children had normal hearing
- All children correctly articulated word final [s, z]

Stimuli

• 30 early-acquired verbs
  » 15 dense: 18 neighbors
  » 15 sparse: 10 neighbors
• Matched on phonological (e.g., phonotactic probability), lexical (e.g., age of acquisition) & syntactic (e.g., argument structure) characteristics

Sentence Imitation Task

• Children were asked to repeat 30 pre-recorded sentences including the third person singular structure
  » 15 sentences with a dense verb
    » The woman kicks the ball
      » Kicks: 21 neighbors
    » 15 sentences with a sparse verb
      » The woman moves the ball
      » Moves: 5 neighbors

Spontaneous Elicitation Task

• Children were asked to generate a sentence after hearing a prerecorded script.
  » 15 scripts including sentences with a dense verb
  » 15 scripts including sentences with a sparse verb
“Here is a woman and this is the ball. The woman’s job is to kick the ball. Now you tell me what the woman does every day at her job. Everyday she___”

“Here is a woman and this is the ball. The woman’s job is to move the ball. Now you tell me what the woman does every day at her job. Everyday she___”

**Scoring**

- Sentences in both tasks were scored as:
  - Correct
  - Moves
  - Incorrect
  - Move
  - Unscorable
  - Non-target verb
  - Different tense marker (e.g., past-tense)
  - No-response

**Independent Variable:**
- Neighborhood density of the target verbs
  - Dense versus sparse

**Dependent Variable:**
- Accuracy of third person singular production on a target verb in both tasks
  - Only responses that included the target verb were used to calculate accuracy

**Preliminary Results**

- 2 task (imitation vs. elicitation) x 2 neighborhood density (dense vs. sparse) ANOVA
  - Main Effect of Neighborhood Density
    - $F(1, 14) = 28.891, p < .001, \eta^2 = .674$
  - Main Effect of Task
    - $F(1, 14) = 2.778, p = .118$
  - Interaction between Task and Density
    - $F(1, 14) = .009, p = .927$

**Dense > Sparse**

![Graph showing accuracy of third person singular production on a target verb in both tasks.](image)
Summary & Conclusions

- Verbs with dense neighborhoods, or more complete lexical representations, facilitate morphosyntax production
  - Verbs with stable lexical representations may be easier to retrieve and facilitate morphosyntax production
- The quality of lexical representations may further inform the lexicon-morphosyntax relationship

Ongoing Data Collection

- Lexical Representations & Language Impairment
- Lexical Representations & Morphosyntactic Change
  - Does manipulating neighborhood density increase gains in morphosyntax for typically developing children and children with SLI?

Thank you!

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