Neighborhood Density and the Ruse in SLI

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INTRODUCTION

SLI in English-speaking children
• Delayed onset and significantly protracted growth of finiteness markers
  • He runs, He walked, He ran, He is running. They are running, He is happy
  • Extended Optional Infinitive (EOI) Account (Rice et al., 1995)
  • Variability is the byproduct of immature knowledge

Phonotactics (Leonard et al., 2007; Marshall & van der Lely, 2006)
• Explains past tense variability in SLI

Neighborhood Density
• Number of words that differ by one sound (Dense vs. Sparse)
• Correlated with age of acquisition (Garcia et al., 2003)
• Index the phonological quality of lexical representations (Storkel, 2002)
• Explains third person singular variability in typical development (Hoover, 2009)

Research Questions
(1) Is neighborhood density a source of 3rd person singular variability for SLI? (Study 1)
(2) Will increased exposure show neighborhood effects in learning for SLI? (Study 2)

STUDY 1: PRODUCTION

Participants
• 15 children ages 4.0 – 6.1 with SLI
• EOI profile (TEGI; Rice & Wexler, 2001; spontaneous language sample)
  • Normal hearing
  • Normal nonverbal intelligence (Reynolds & Karmhava, 2001)

Stimuli
• 30 early acquired verbs
  • Dense (M = 15 neighbors)
  • Sparse (M = 7 neighbors)
  • Storkel & Hoover (2010): (28) = 4.41, p < .001
  • Phonotactic probability, word frequency, syllable structure, age-of-acquisition, argument structure, final allomorph created by 3rd person singular allomorph balanced
  • Sentences featuring 3rd person singular constructed around verbs for two tasks
  1. Sentence Imitation: Children repeated 30 sentences
     • 15 DENSE: The woman KICKS the ball
     • 15 SPARSE: The woman MOVES the ball
  2. Spontaneous Elicitation: Children generated 30 sentences
     • 15 scripts with a DENSE verb
     • 15 scripts with a SPARSE verb

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

Dependent Variable: Third person singular % accuracy
Independent Variable: Neighborhood density (dense vs. sparse)

STUDY 2: TREATMENT

Participants
• 6 children ages 4.0 – 5.6 from Study 1

Stimuli
• 12 early acquired verbs
  • 6 dense (M = 13 neighbors)
  • 6 sparse (M = 6 neighbors)
  • (10) = 2.51, p < .05
  • Selected and balanced following Study 1 procedures

General Treatment Procedures
• Single-subject experimental treatment design
• Assignment to DENSE or SPARSE treatment condition
• No treatement baseline with repeated administration of Study 1 tasks
• 12 sessions of treatment
• Auditory input, direct imitation and spontaneously elicited productions
• Post-treatment test using Study 1 tasks

Dependent Variable
• Third person singular accuracy change for Study 1 Verbs

Analysis: 2 Density x 2 Task ANOVA

Primary Result
• Neighborhood density was not a source of variability for SLI
• Main effect of task only, F(1, 19) = 5.64, p < .05, η² = .23
• Counter to:
  • Typical development (Hoover, 2009)
  • Phonotactics (Leonard et al., 2007; Marshall & van der Lely, 2005)

STUDY 2: TREATMENT

Dense Condition
All Verbs

Dense Condition
Third Person Singular % Change

Sparse Condition
Third Person Singular % Change
Dense vs. Sparse

Dense Condition

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DISCUSSION

Integrated Conclusions
• Limited exposure was insufficient to activate neighborhood effects (Study 1)
• Immature knowledge for finiteness may overpower potential for effects
• Children with SLI are sensitive to neighborhood effects (Study 2)
• Neighborhood effects may be delayed/emergent requiring repeated exposure for
  • Repeated exposure to sparse verbs showed:
    • Greater overall third person singular change
    • Pattern of post-treatment neighborhood effects mirroring typical development (Hoover, 2009)
    • Recognition advantage for sparse verbs reduced variability in finiteness over time
    • Emerging representation of sparse verbs more amenable to change

Limitations
• Neighborhood effects interact with phonotactics (Hoover et al., 2010)
• Large exposure discrepancy between Study 1 & Study 2
• Difference in paradigm for Study 1 vs. Study 2
• Generalizability to entire finiteness system is limited

REFERENCES

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