I. Introduction

- Specific language impairment (SLI): presence of language difficulties in the absence of related factors (Leonard, 1998)
- Comprehension difficulties in children with SLI may be the result of limited linguistic processing ability
- WH-question comprehension tasks used to assess processing limitations (Deevy & Leonard, 2004)

Structural Distance

- Subject question: What [ x was hitting the flower ]?
- Object question: What [ the apple hitting x ]?
- Location of gap (e.g., x; argument position to which the WH-word is related) must be identified before WH-question can be interpreted
- Greater distance between WH-word & gap = delay in interpretation = higher processing demands
- Subject questions: shorter distance (gap: subject position)
- Object questions: greater distance (gap: object position)
- Greater structural distance in object questions may result in higher processing load (Deevy & Leonard, 2004)

Syllabic Distance

- Long subject question: What [ only just now x was hitting the flower ]?
- Long object question: What [ the apple only just now hitting x ]?
- Adverb padding (e.g., only just now) increases length in # of syllables without changing structure
- Long questions should be more difficult than short

Linguistic Processing Limitation Account

- Predicts that long object questions are the most difficult to understand because structural & syllabic distance increase processing demands

II. Methods

Participants:

- 11 children with SLI (M age = 5.3; SLELT-II < 10th %-ile) & 11 TD children (M age = 4.6; SLELT-II > 17th %-ile) matched for receptive vocabulary raw scores (PPVT-III); All participants: age appropriate nonverbal ability & oral structure/function, passed hearing screening, appeared neurologically unimpaired

Visual Stimuli:

- Saw movie of object hitting another object on LCD projection display

Verbal Stimuli:

- Heard variety of pseudo-randomized questions (after action) manipulated for structural (e.g., subject, object) & syllabic (e.g., +/− padding) distance

Data:

- Eye movements recorded during study and later coded frame-by-frame
- Analyzed eye movements conducted after question presentation; calculated % looking time to target (vs. non-target)
- Mixed-model ANOVA: group (e.g., SLI, TD), structural distance (e.g., subject, object), syllabic distance (e.g., short, long)

III. Results

- In preliminary task (e.g., identify objects shown on screen), demonstrated above-chance looking behavior (TD: 75%; SLI: 71%)
- Supports assumption that eye movements reflect comprehension

Significant Main Effects

- Structural Distance (F(1, 20) = 5.27, p = 0.03)
- Syllabic Distance (F(1, 20) = 4.70, p = 0.04)

Significant Interactions

- Structural Distance x Group (F(1, 20) = 4.64, p = 0.04)
- Syllabic Distance x Group (F(1, 20) = 3.73, p = 0.068) * marginal

IV. Discussion

Main effect for structural distance

- Deterioration in performance on object questions
- Interaction of structural distance x group : TD group is creating subject/object asymmetry

Main effect for syllabic distance

- Deterioration in performance on long (e.g., padded) questions
- Interaction of syllabic distance x group (margin): TD group is creating short/long asymmetry
- SLI group: variability in distance does not create variability in performance
- Increased processing demands should = reduced performance

We propose that the children with SLI were using a non-grammatical strategy to answer the WH-questions.

Overt Strategy: look for the object not named in the question

Question: What was the apple hitting?

Overt Strategy: not apple, must be flower

To test Overt Strategy:

- Introduce ambiguity by using 3 objects in visual stimuli (instead of 2)
- Overt Strategy not sufficient because 2 objects not named in question
- Predict SLI group performance < TD group performance

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References