## The Problem

### Filler-Gap Dependencies

Wh-questions (1-2) and Relative Clauses (3-4) are thought to be formed by the same grammatical mechanisms, and parsed using the same parsing mechanisms.

1. Which dog bumped the cat?
2. Which dog did the cat bump?
3. Show me the dog that bumped the cat
4. Show me the dog that the cat bumped

Adults have shown asymmetries in parsing subject (1,3) and object (2,4) extractions.

### Two Asymmetries

- **Subject-Object Asymmetry**
  - Older children (3-5yrs) have shown asymmetries comprehending subject and object relatives.

- **Wh Question-Relative Clause Asymmetry**
  - 20-month-olds can understand subject and object wh-questions (1-2). But they cannot understand relative clauses, (3-4)

### Hypotheses

1. **Processing limitations at 20-months** mask grammatical knowledge. 20-month-olds attempt to parse both wh-questions and relative clauses like adults as active fillers, but struggle without salient cues to the filler.
2. **20-month-olds have separate representations and parsing strategies for wh-questions and relative clauses**

### Predictions

1. Increasing the salience of the filler will aid 20-month-olds in parsing and comprehending relative clauses
2. Older children should have overcome the processing difficulties caused by the non salient filler and be able to parse relative clauses
3. Subject-Object asymmetries should be present if our measurements are sensitive enough

### Current Study

#### Testing these Predictions

- Increase salience of filler (morphologically marked who as relative pronoun instead of that)
- Test older children (30-month-olds) on relative clause comprehension

#### Participants & Design

- 80 20 month olds (mean 20.7) and 58 30-month olds (mean 30.23)
- 6 trials per subject
- 3 target utterances per trial

Factors:
- Extraction (subject vs object)
- Relative Pronoun (that vs who)

#### Materials

<table>
<thead>
<tr>
<th>Action</th>
<th>Test</th>
<th>Target utterances</th>
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<tbody>
<tr>
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<td>Who Relatives</td>
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<td>(1) Show me the dog who bumped the cat</td>
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<td>(2) Show me the dog who the cat bumped</td>
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<td>That Relatives</td>
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<td></td>
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<td>(1) Show me the dog that bumped the cat</td>
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<td></td>
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<td>(2) Show me the dog that the cat bumped</td>
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#### Results

1. **20-month-olds: that-relatives**
   - 20-month-olds don’t appear to comprehend that-relatives (last 3 trials, all p values n.s.)
2. **20-month-olds: who-relatives**
   - 20-month-olds appear to comprehend who relatives (last 3 trials, condition means: p < 0.02, object-chance: p < 0.05, subject-chance: n.s.)
3. **30-month-olds: that-relatives**
   - 30-month-olds appear to comprehend that relatives. (last 3 trials, condition means: p < 0.005, object-chance: p < 0.05, subject-chance: n.s.)
4. **30-month-olds: who-relatives**
   - 30-month-olds appear to comprehend who relatives. (last 3 trials, condition means: p < 0.08, object-chance: p < 0.005, subject-chance: n.s.)

#### Conclusions

- Morphological marking on the filler improves 20-month-olds’ performance, indicating that they have the grammatical knowledge necessary for the parsing of relative clauses.
- Closer examination of 20-month-old that-relative data shows signs that infants may have some understanding but are overwhelmed with processing demands.
- 30-month-olds were able to comprehend both types of relative clauses and close examination of their data suggests a possible subject-object asymmetry.