Factors that impact the comprehension of SVO sentences in English-speaking toddlers: A pilot study

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Introduction

- In English, there are different linguistic cues for decoding subject and object relations in SVO transitive sentences (Chan, Lieven, & Tomasello 2009).
- Pronouns (e.g., I, me, he, she, him, and her).
- The agent marker "by".
- Subject-verb agreement.
- Word order.
- Children use both linguistic and non-linguistic cues (e.g., animacy knowledge) to comprehend sentences. Young children may rely more on non-linguistic cues (Chan et al., 2009; Chapman & Miller 1975; Childers & Echols 2004).
- Toddlers' comprehension performance followed this hierarchy: Animate Subject = Verb = Inanimate Object (AVI, cues converge) > Animate Subject = Verb = Animate Object (AVA, only word order is relevant) > Inanimate Subject = Verb = Animate Object (IVA, cues in conflict). These studies (Chan et al., 2009; Chapman & Miller 1975; Childers & Echols 2004) utilized active comprehension tasks (act-out and choosing the animate noun).

The Current Study

We aim to investigate toddlers’ use of animacy cue to comprehend SVO transitive sentences via eye-tracking technology. We also consider the interactions between toddlers’ animacy knowledge and inhibitory control abilities.

Research Questions

- Do children show this well-documented pattern in an eye-tracking paradigm?
- Are children’s animacy knowledge and inhibitory control skills related to sentence interpretation?

Participants

<table>
<thead>
<tr>
<th>Age (years/months)</th>
<th>Child 1</th>
<th>Child 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Maternal Education</td>
<td>18 years - Master’s Degree</td>
<td>21 years – Doctorate Degree</td>
</tr>
<tr>
<td>Languages</td>
<td>Monolingual - English</td>
<td>Bilingual – English and Spanish</td>
</tr>
<tr>
<td>Sessions to complete all tasks</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1: Demographic Information of Child 1 and Child 2

Tasks

Comprehension: Eye-Tracking

- We used the Tobii Pro Spectrum eye tracker.
- It is assumed that children’s eye gaze patterns reflect their understanding of the verbal prompt.

Card Sorting Tasks

Animacy

- Card sorting based on if the object was “living” or “non-living.”

Inhibitory Control: Color-object

- 1st stage – sorting by color (i.e., red VS blue).
- 2nd stage – sorting by shape (i.e., rabbit VS flower).

Inhibitory Control: Day-Night

- 1st stage – sorting using conventional rules: sun → daytime; moon → night time.
- 2nd stage – sorting using reversed rules: moon → daytime; sun → night time.

For both inhibitory control tasks, we examined accuracy of sorting in the second stage.

Results

<table>
<thead>
<tr>
<th>Task</th>
<th>Child 1</th>
<th>Child 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animacy</td>
<td>16/16</td>
<td>10/16</td>
</tr>
<tr>
<td>Color-Object</td>
<td>9/10</td>
<td>0/10</td>
</tr>
<tr>
<td>Day-Night</td>
<td>10/10</td>
<td>0/10</td>
</tr>
</tbody>
</table>

Table 2: Results of Card-Sorting tasks for Child 1 and Child 2

Discussion

RQ 1: Neither child showed the predicted pattern.

- Child 1 showed an IVA->AVI->AVA pattern.
  - Compared to previous studies that used act-out or pointing tasks, the current study used the eye-tracking technique, a rather passive task.
  - Child 1 may prefer IVA animations because these events and sentences as rarer in real life.
- Child 2 did not demonstrate a clear comprehension hierarchy.
  - Child 2 had less valid trials compared to Child 1.
  - Child 2 may find all animations equally interesting.

RQ 2: More data are needed to answer this research question.

- Child 1 showed stronger animacy knowledge and inhibitory control skills than Child 2.
- Due to the small number of participants, there is not enough data to support the claims that children’s animacy knowledge and inhibitory control skills are related to sentence interpretation.

References


Acknowledgements

- Terry Epling, Communication Sciences and Disorders Graduate Student, University of Delaware
- U. Zhang, The Department of Communication Sciences and Disorders, University of Delaware
- Ning Hou, The Department of Communication Sciences and Disorders, University of Delaware
- Yang Han, The Department of Communication Sciences and Disorders, University of Texas at Austin
- Isabel Ryan, The Department of Linguistics and Cognitive Science, University of Delaware
- Participating children and parents