Psych 229: Language Acquisition

Lecture 7
Categories & Models

Gómez & Lakusta 2004: Categorization

**Categories & Models**

Gómez & Lakusta 2004: Categorization

What’s going on (aX, bY paradigm) - a 2 step process

**Initial Association**

\[ a \rightarrow X \text{ (with cue)}, \quad b \rightarrow Y \text{ (with cue)} \]

**Category Membership (abstract)**

D1 is type a since it goes with X - how is D1 like other as?

D2 is type b since it goes with Y - how is D2 like other bs?

17-month olds can do both steps

What about younger children?

7-12 months abilities: previous work

So let’s look at 12-month olds...

**General procedure**

Basic (Example) Task: Data

<table>
<thead>
<tr>
<th>syllables</th>
<th>amount of data, short exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>17 months old can do both steps</td>
</tr>
<tr>
<td>1</td>
<td>7-12 months abilities: previous work</td>
</tr>
</tbody>
</table>

**Novel “vocabulary”**

<table>
<thead>
<tr>
<th>syllables</th>
<th>amount of data, short exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>17 months old can do both steps</td>
</tr>
<tr>
<td>1</td>
<td>7-12 months abilities: previous work</td>
</tr>
</tbody>
</table>

**Previous work (aX, bY paradigm)**

Gómez & Lakusta 2004: Categorization

What’s going on (aX, bY paradigm) - a 2 step process

**Initial Association**

\[ a \rightarrow X \text{ (with cue)}, \quad b \rightarrow Y \text{ (with cue)} \]

**Category Membership (abstract)**

D1 is type a since it goes with X - how is D1 like other as?

D2 is type b since it goes with Y - how is D2 like other bs?

17-month olds can do both steps

What about younger children?

7-12 months abilities: previous work

So let’s look at 12-month olds...
Infants can make abstract rules and apply it to new items. But what is the relationship of this to "real" categorization? 

Abstraction = # of syllables (how realistic is this?)

Threshold for generalization

If abstracted, infants should make the association (familiarity preference), but if specific, they should not (novelty preference).

Main conclusion about categorization

In the current experiment, we showed that infants are able to make abstract rules and apply them to new items. However, the level of abstraction may vary depending on the context and the nature of the items.
Gómez & Lakusta 2004: Categorization

Discussion questions

Relation to bilingual learning: If children are equipped to learn the predominant structure (assuming it’s more than 83% of the data), what does this mean for bilingual children where the data distributions are far messier? (Related question: what if the two languages have different structures?)

Artificial language vs. real language situations: How valid are artificial language results for explaining real language learning, especially since artificial languages are missing so much information available in real languages?

Related: Is distinguishing between one and two-syllable words a realistic analogy for categorization?

Mintz 2003: Frequent Frames

Just to remind us of the problem again in more detail...

What information should children be tracking?

How about local linguistic environments?

18-month olds can use non-adjacent information

And lexical items are salient

Better than bigrams (transitional probability)

...more informative by themselves

The plan: Are frequent frames a useful strategy on real data? Do they yield the right information?

...more suitable and effective than how and higher

The goal of the work described here was not to provide a model of prescriptive categorization but rather to develop a framework for understanding what children are actually doing in such tasks. Specifically, the goal was to make the results of their categorization performance match the results of an analysis of the target categories. In this way, it is possible to see how children are making use of the information available in the data to form their categorization.
Mintz 2003: Frequent Frames

Table 1

<table>
<thead>
<tr>
<th>Frame</th>
<th>Precision</th>
<th>Recall</th>
<th>F1-Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame A</td>
<td>0.85</td>
<td>0.90</td>
<td>0.87</td>
</tr>
<tr>
<td>Frame B</td>
<td>0.75</td>
<td>0.85</td>
<td>0.80</td>
</tr>
<tr>
<td>Frame C</td>
<td>0.90</td>
<td>0.80</td>
<td>0.85</td>
</tr>
</tbody>
</table>

Mintz 2003: Frequent Frames

"Precision" and "Recall" for different frame categorizations showing mean values with standard deviation.