Beyond frequency: Does verb class affect order of learning?

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Boston College
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@ABC Conference
Introduction

Factors that influence the order of acquisition

- Frequency (Goodman, Dale, & Li, 2008; Hansen, 2017)
- Syntactic class (Gentner, 1982; Goodman et al., 2008; Hansen, 2017)
- Imageability (Hansen, 2017; McDonough, Song, Hirsh-Pasek, Golinkoff, & Lannon, 2011)
Introduction

Factors that influence the order of acquisition

• Frequency (Goodman, Dale, & Li, 2008; Hansen, 2017)
• Syntactic class (Gentner, 1982; Goodman et al., 2008; Hansen, 2017)
• Imageability (Hansen, 2017; McDonough, Song, 15 Hirsh-Pasek, Golinkoff, & Lannon, 2011)

Insufficient in their explanatory power
Introduction

Hartshorne, Pogue, & Snedeker (2015)

\textit{John} frightened \textit{Mary}.
\textit{Mary} feared \textit{John}.
Introduction

Hartshorne, Pogue, & Snedeker (2015)

*John frightened Mary.*

*Mary feared John.*

• Frequency: frighten-type verbs < fear-type verbs
• Order of acquisition: frighten-type verbs > fear-type verbs

So ... why?
Introduction

Hartshorne, Pogue, & Snedeker (2015)

*John frightened* Mary.

Experiencer

*Mary feared* John.

Experiencer
Introduction

Hartshorne, Pogue, & Snedeker (2015)

*John frightened Mary.*
Experiencer

*Mary feared John.*
Experiencer

• Linking rule: agents of caused events <-> sentential subjects
  --> frighten-type > fear-type
Introduction

What drives the difference in the order of acquisition?
• Linking rule: agents of caused events <-> sentential subjects

Alternatives:
• Verb-class size: frighten-type (253) > fear-type (57)*
• Cognitive salience: caused changes > persistent attitudes?

The current study

Three experiments with three different pairs of verb classes
• Frighten-type vs. fear-type
• Chase-type vs. flee-type
• Give-type vs. receive-type
Experiment 1: frighten-type vs. fear-type

Predictions:

<table>
<thead>
<tr>
<th></th>
<th>Frighthen-fear</th>
<th>Chase-flee</th>
<th>Give-receive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>fear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verb class</td>
<td>frighten</td>
<td></td>
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<tr>
<td>Causality</td>
<td>frighten</td>
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<tr>
<td>Salience</td>
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</tbody>
</table>
Experiment 1: frighten-type vs. fear-type

Experimenter 1

See Elephant? Elephant is playing outside. Then he sees Monkey. Elephant screams. Then he runs away and hides.
Experiment 1: frighten-type vs. fear-type

Experimenter 1: See Elephant? Elephant is playing outside. Then he sees Monkey. Elephant screams. Then he runs away and hides.

Experimenter 2: I know what happened. The elephant fears the monkey.
Experiment 1: frighten-type vs. fear-type

Experimenter 1

See Elephant? Elephant is playing outside. Then he sees Monkey. Elephant screams. Then he runs away and hides.

Experimenter 2

I know what happened. The elephant fears the monkey.

Child
Experiment 1: frighten-type vs. fear-type

Materials:
• 8 frighten-type vs. 8 fear-type

Participants:
• 3 year-olds (54)
• 4 year-olds (73)
• 5 year-olds (82)
• 6 year-olds (34)

Results:
• Frighten-types > fear-type
## Experiment 1: frighten-type vs. fear-type

<table>
<thead>
<tr>
<th></th>
<th>frighten vs. fear</th>
<th>chase vs. flee</th>
<th>give vs. receive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>N</td>
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<td></td>
</tr>
<tr>
<td>Verb class</td>
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<td></td>
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<tr>
<td>Causality</td>
<td>Y</td>
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<td>Salience</td>
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</table>
Experiment 2: chase-type vs. flee-type

Predictions:

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<th>Frigthen-fear</th>
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<tr>
<td>Frequency</td>
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<td>chase</td>
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</tr>
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<td>Verb class</td>
<td>frighten</td>
<td>chase</td>
<td></td>
</tr>
<tr>
<td>Causality</td>
<td>frighten</td>
<td>neither</td>
<td></td>
</tr>
<tr>
<td>Salience</td>
<td>--</td>
<td>chase?</td>
<td></td>
</tr>
</tbody>
</table>

- Chase-type more salient (Landau & Gleitman, 2015; Fisher, Hall, Rakowitz, and Gleitman, 1994)
- Mixed (Gleitman, January, Nappa, and Trueswell, 2007):
Experiment 2: chase-type vs. flee-type

Experimenter: story
Tiger chased Giraffe.

Child: act out
Experiment 2: chase-type vs. flee-type

Materials:
• 3 chase-type vs. 3 flee-type

Participants:
• 3 year-olds (43)
• 4 year-olds (43)
• 5 year-olds (40)
• 6 year-olds (41)

Results:
• An early advantage of flee-type
Experiment 2: chase-type vs. flee-type

Accuracy for each verb against log frequency, split into four age groups, with linear regressions shown.
Experiment 2: chase-type vs. flee-type

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## Experiment 3: give-type vs. receive-type

### Predictions:

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- receive-type more salient (Freeman, Sinha, & Stedmon, 1981; Fujita, 2000; Lakusta & Landau, 2005, 2012; Papafragou, 2010; Regier & Zheng, 2007)
Experiment 3: give-type vs. receive-type

Video: two experimenters exchange objects

What did the boy/girl give?
Experiment 3: give-type vs. receive-type

Materials:
• 4 give-type vs. 4 receive-type

Participants:
• 3 year-olds (107)
• 4 year-olds (105)
• 5 year-olds (109)
• 6 year-olds (104)

Results:
• An early advantage of receive-type
## Experiment 3: give-type vs. receive-type

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Implications

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- None of frequency, verb class size, salience or causality can explain all cases
- Towards a theory of word acquisition
Acknowledgements

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References


References (cont’d)


