Getting Support for ‘Support’: The Privileging of ‘Support-From-Below’ in Early Spatial Language Acquisition

Experiments in Linguistic Meaning
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Support:
A force dynamic relation between objects
(Coventry et al., 1994; Herskovits, 1986; Vandeloise, 2010)
Research Question

How do young children learn the spatial language that encodes such an abstract spatial relation?

Very broad, highly abstract category?

Infant research suggests no....
Past research

- Infants *reason* about support configurations (see Baillargeon & DeJong, 2017)

- 2.5 – 4 months: Support = Contact

- ~ 5 months: Type of support matters

- > 5 months: More sophisticated reasoning

- Infants *categorize* support configurations (see Park & Casasola, 2015, *JECP*)
Past research

Support-From-Below is special

Also, language research...
Past research

• Basic Locative Construction (Levinson & Wilkins, 2006) (BE on in English) → SFB

‘Division of Labor’ (see Landau, 2018)

Proportion of descriptions using is on and lexical verbs

- 1.00
- 0.80
- 0.60
- 0.40
- 0.20
- 0.00

Support from Below

Mechanical Support

is on

Lexical verb of attachment (e.g., “hang”)

(Landau, Johannes, Skordos & Papafragou, 2016, Cognitive Science; Johannes, Wilson, & Landau, 2016, Cognition)
Past research

Infant cognition research

‘Division of Labor’ in language research

Support-From-Below is privileged...

(See Landau, 2018)
Current hypothesis:
‘Privileging’ of Support-From-Below has consequences for language learning

• If so,

1) Infants should preferentially map the canonical term for encoding support (e.g., “on”) to Support-From-Below (SFB) over Mechanical Support

2) Children should show a ‘Division-of-Labor’ very early in language development
Experiment 1: Preference to map “on” to SFB?

N = 24, 20-month-olds

“Look at the toy and the box.”

“Look here! What do you see? Look here!”

“Find the toy that IS ON the box.”
Results

Time course analysis for looking durations at SFB and Support-Via-Side events during Salience vs. Test phases
Exp. 1: Conclusion

• 20-month-old infants map “on” to Support-From-Below vs. Support-Via-Side

The Basic Locative Construction (“is on”) maps preferentially to Support-From-Below in early spatial language learning

SFB is privileged for the domain of support

• What about a ‘Division of Labor’ in early development?
Experiment 2a: Do children map...

BE on \(\rightarrow\) Support-From-Below

Specific lexical verbs (hang, stick, etc.) \(\rightarrow\) Mechanical Support

• Participants:
  • N =14 for 3.5- and 4.5-year-olds

• Method: Elicited Production
“If Nicholas cannot find his smock, you’d say, your smock...”.
<table>
<thead>
<tr>
<th>PRACTICE</th>
<th><img src="basket.png" alt="Basket" /></th>
<th><img src="shoe.png" alt="Shoe" /></th>
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<td><img src="pot.png" alt="Pot" /></td>
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<tr>
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<td><img src="chair.png" alt="Chair" /></td>
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<tr>
<td>HANGING</td>
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<td><img src="frame.png" alt="Frame" /></td>
<td><img src="flag.png" alt="Flag" /></td>
</tr>
<tr>
<td>ADHESION</td>
<td><img src="canister.png" alt="Canister" /></td>
<td><img src="notepad.png" alt="Notepad" /></td>
<td><img src="mug.png" alt="Mug" /></td>
</tr>
</tbody>
</table>
‘Division of Labor’

Results

Privileging of SFB

Proportion of IS ON used

Support-From-Below

Adhesion

Hanging
Experiment 2b: Do children map...

BE on → Support-From-Below
Specific Verbs (hang, stick, etc.) → Mechanical Support

• Participants:
  • N =15, 3.5- and 4.5-year-olds

• Method: Forced Choice Comprehension Task
  • Two characters give different descriptions....
| LEXICAL VERB USED BY ADULTS | SUPPORT FROM BELOW | ADHESION SUPPORT | HANGING SUPPORT |
|-----------------------------|--------------------|------------------|-----------------
| IS ON                       | “I say it is on the box.” | “I say it is on the easel.” | “I say it is on the hook.” |
| VS                          | ![Image of toy car on a box](image) | ![Image of easel](image) | ![Image of hanging from a hook](image) |
| INCORRECT LEXICAL VERB      | “I say it is taped to the plate.” | “I say it is clipped to the apple.” | “I say it is taped to the backpack.” |
| IS ON                       | ![Image of toy car on a plate](image) | ![Image of apple](image) | ![Image of backpack](image) |
Results

Is on vs. a lexical verb

Examples:
- is on vs. standing on
- is on vs. taped to
- is on vs. hanging from

Children prefer lexical verb

Is on vs. *incorrect* lexical verb

Examples:
- is on vs. taped to
- is on vs. clipped to
- is on vs. sticking to

Support - From-Below
Adhesion
Hanging

Children prefer is on
Exp. 2: Conclusion

- Children show a ‘Division of Labor’ early in development

Consistent with spontaneous production study; See Lakusta et al., 2020, LLD
What about mapping language to the mechanical support?

1. Privileged concept of SFB differentiates semantic space
2. Children need to learn how specific lexical verbs map to mechanical support. Role for first-hand experience with mechanical support and parent input?
Overall Conclusion

Support-From-Below is privileged…consequences for early spatial language learning
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