

Prepositional Gaps at 15 Months of Age

English interrogatives feature wh-movement which fronts wh-words and creates gaps in the body of a question, as in (1).

- (1) What did Maryam buy __?

The acquisition literature suggests that 15-month-old infants are sensitive to gaps in wh-questions and respond correctly to wh-questions using interpretation heuristics based on verb knowledge; they do not yet represent filler-gap dependencies until 18 months of age (Gagliardi et al., 2016; Perkins & Lidz, 2019; Perkins & Lidz, 2021). Specifically, transitive verbs signal direct objects in declarative clauses, so when a gap follows a transitive verb, 15-month-olds are guided by the transitivity of the verb to search for the undergoer of the action denoted by the verb.

For instance, Gagliardi et al. (2016) show that 15-month-olds respond correctly to wh-questions as well as relative clauses whereas 20-month-olds respond correctly to wh-questions and relative clauses only with wh-words heading the relatives. The hypothesis based on the findings is that 15-month-olds do not represent the dependency between the filler and the gap but can find the patient to fill the role for the direct object gap in sentence understanding, whereas 20-month-olds represent filler-gap dependency but have trouble deploying the knowledge in real time. This is borne out in Perkins and Lidz (2019). Only 15-month-olds with higher vocabulary can identify the answer to wh-questions and relative clauses, suggesting that infants' knowledge of verb transitivity needs to be in place for their interpretation heuristics to come into play.

While infants learning English-type languages understand utterances of wh-questions by responding to gaps they observe in the body of the question, it is not well understood as to how general their gap-filling strategy is in tackling different questions. For instance, in terms of argument questions, the fronted wh-words (*what*, *who*) can be a complement required by a verb as in (2) or one required by a preposition as in (3).

- (2) What did she open __?

- (3) What did she open the box with __?

If 15-month-olds can use transitive verbs in predicting direct object gaps as in (2), do they generalize the strategy to prepositions that predict prepositional object gaps as in (3)? A further question would be what it can reveal about the acquisition path if 15-month-olds do or do not generalize the strategy to prepositions.

If 15-month-olds correctly respond to a wh-question with preposition stranding, this would suggest that infants' early disposition to respond to wh-questions is driven by a general role-filling heuristic that is informed by the expected transitivity of categories. As prepositions require dependents while verbs not always do, dependents of prepositions like "with" should be easier to recover compare to dependents of verbs.¹ This predicts that 15-month-olds should respond correctly to (3) regardless of their size of vocabulary (Perkins & Lidz, 2019). On another note, correctly responding to (3) would also demonstrate infants' early capacity for integrating a prepositional phrase into a verb phrase.

¹ In the Soderstrom corpus at CHILDES with age ranging from 0;5.3 to 1;0.29, "with" is transitive 94.6% of the times in Motherese (420 out of 444).

If, however, 15-month-olds fail to respond to wh-questions with preposition stranding, several factors could account for the difficulty. One possible factor is the difficulty with parsing an adjunct within a verb phrase. In other words, since the missing argument is inside an adjunct, responding to such an argument gap would require infants to first integrate the preposition into the verb phrase and then identify the missing piece inside a preposition phrase. This could still be taxing for 15-month-olds, as questions with preposition stranding are rare in infant-directed speech.² Note that this is unlike the task of directly mapping an NP complement of “with” onto an instrument, for which there is more input supporting the mapping (Hirzel et al., 2020; Lidz et al., 2017). Another factor is the semantic abstractness associated with the preposition “with”. That is, while infants’ role-filling strategy seems to work well with action-denoting lexical verbs that expect a patient, it might not be as effective for a semantically opaque preposition like “with” to trigger expectation for an instrument. Moreover, instruments relate to events in different ways, and it is unclear whether infants’ integration of instruments into verbs relies partially on their world knowledge of possible verb-instrument pairings.

While transitivity-based interpretation heuristics may guide 15-month-olds in responding to argument wh-questions, it does not seem to be well-suited for them to resolve adjunct wh-questions. For adjunct wh-questions like (4) and (5), the fronted wh-words (e.g., *how*, *why*) leave behind gaps that are impossible to be recovered.

(4) How did she open the box ___?

(5) Why did she open the box ___?

Crucially, if what engages 15-month-olds with responding to wh-questions is merely the signal of a locally absent dependent in the body of the clause, (4) or (5) would be clearly less engaging, as there is no element in the body of the clause, whatsoever, that can elicit a response and guide interpretation. This captures a major difference between argument and adjunct wh-questions – while the displacement of argument wh-words impairs the body of the question regarding its local configuration, the displacement of adjunct wh-words does not. That is, for (2) and (3), the body of the question “Did she open?” and “Did she open the box with?” are ungrammatical, yet for (4) and (5), the body of the question “Did she open the box?” is perfectly grammatical.

References

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² In the Soderstrom corpus of 1-year-olds, only 10 instances of a “with” gap in a question is found in Motherese, e.g., “Is there any other things we’d like to play with?”. In the Feldman corpus of 2- to 3-year-olds (1;6;0-2;3;0), only one instance of a “with” gap (1 out of 20) is found in Motherese, i.e., “It was the Jonathon’s that he had trouble with”.