CONTRASTIVE TOPICALIZATION IN CHILD ENGLISH: THE CASE OF THE DATIVE ALTERNATION

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Abstract:

This paper reports the results of an elicited production experiment on the acquisition of English, designed to assess children's knowledge of contrastive topicalization strategies (Büring 2003). In particular, it was tested whether children's choice between the prepositional dative construction and the double object construction (the so-called "dative alternation") with the verb *give* was influenced by (i) the discourse givenness and topicality of themes and recipients, (ii) the situational necessity of contrast, and (iii) the use of the expected construction by the child's interlocutor (prompt). The results provide evidence for the role of all factors, showing that four-and-a-half-year-olds are sensitive to the distinction between topics and foci and are able to produce contrastive topicalization. Although children did not produce an adult-like rate of contrastive topicalization strategies (which is tentatively explained by their underuse of gapping constructions), they did reveal adult-like preferences with respect to the choice of a dative construction that better matches the context. Children's sensitivity to contrast is evidenced by the fact that children more frequently employed contrastive topicalization strategies as conditions increasingly required so — as well as the fact that in the presence of contrastive topicalization, topics and foci alike were categorically expressed as full noun phrases rather than pronouns. The paper provides further evidence for children's early pragmatic competence, especially active knowledge of contrastive topicalization, demonstrated in their adult-like, pragmatic-sensitive use of the dative alternation. This study thus contributes to the investigation of the interface between syntax and Information Structure in language acquisition.

Key-words:
Language acquisition, information structure, contrastive topicalization, focalization, dative alternation.

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1. INTRODUCTION

This paper investigates the acquisition of ***contrastive topicalization*** by children acquiring English as their first language, by presenting and discussing the results of an elicited production experiment. It thus contributes to the investigation of the interface between syntax and the interpretive components (especially pragmatics) in first language acquisition, by shedding light on a specific but complex phenomenon of Information Structure — that is, the interplay between matters of discourse (such as topic, focus, and contrast) and matters of sentence structure.

Contrastive topicalization is a genuine interface phenomenon, with interesting aspects seen in (the interplay of) structure, meaning, and form. According to Büring (2003), the primary function of contrastive topics is "to indicate a strategy" (towards answering a question) (p.535) (in the sense of Roberts 1996). A *strategy* does not fully answer a question; rather, (in a declarative sentence) it indicates an answer to a sub-question of the question under discussion. For instance, observe the dialogue in (1), supposing speakers A and B are aware that John has a couple of things that he does not want

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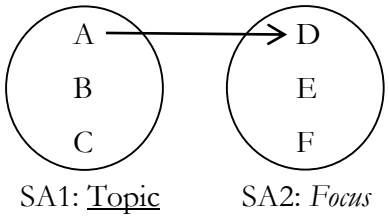
anymore (e.g. a book and a computer). In such context, the answer in B fully addresses the question under discussion in A. On the other hand, the speaker who answers the question may alternatively choose to use B', if he or she chooses a partial answer strategy. The sentence in B' breaks down the question into sub-questions, thus creating a contrastive interpretation among the alternative sentences in the set of possible partial answers.

(1)	A: What did John do in the end?	*Question under discussion (QUD)*
	B: He gave his things to his friends.	*Addresses the QUD*
	B': He gave <u>his book</u> *to Mary*.	*Addresses a sub-question of the QUD*
	(…and he gave <u>his computer</u> *to Bill*)	

More precisely, contrastive topicalization marks a relation between two sets of alternatives (a set of topics and a set of foci; see Büring 2003 and Wagner 2012, among others). The first set of alternatives (SA1) is the source of the topicalized element (underlined in the relevant examples), whereas the second set of alternatives (SA2) is the source of the focalized element (italicized in the relevant examples). As schematized in (2), the element chosen from SA1 is associated/linked to an element of SA2. Topic and focus are thus *linked alternatives*.

(2)



The linking of elements from one set to another can in principle occur in either direction (subject to semantic and pragmatic factors, as the choice made in SA1 restricts the possibilities in SA2, a matter that will not be relevant here). In other words, either of the two sets of alternatives at stake

can be the source of the topic or the source of the focus. Now observe the dialogue in (3), supposing a second scenario where speakers A and B share the information that John wants to do something for his friends (e.g. Mary and Bill).

(3)	A: What did John do in the end?	*Question under discussion (QUD)*
	B: He gave his friends some gifts.	*Addresses the QUD*
	B': He gave Mary *a book*.	*Addresses a sub-question of the QUD*
	(…and he gave Bill *a computer*)	

Both scenarios (1) and (3) above have in common the formation of the unordered pairs in (4)a, but they differ in choosing the directionality of these pairs, i.e. in choosing which element is presented as the topic and which element is presented as its associated focus (cf. (4)b-c). This alternation (called "topic-focus swap" by Neeleman and van der Koot 2008) is here assumed to be conditioned by the discursive context and the speaker's attitude towards it.

(4)	a.	{Mary, book}, {Bill, computer}	*both scenarios*
	b.	<book, *Mary*>, <computer, *Bill*>	*scenario in (1)*
	c.	<Mary, *book*>, <Bill, *computer*>	*scenario in (3)*

This paper experimentally investigates whether — and, most importantly, how — (normally developing) children acquiring English as their first language make use of contrastive topicalization strategies. As illustrated above, contrastive topicalization is a complex discursive mechanism, for it involves both a topic and a focus component in a contrastive manner. In order to assess children's knowledge of this phenomenon, a *syntactic domain* where it could be tested was chosen — as revealed by the examples above, this domain was the so-called ***dative alternation***. Following much work on

this phenomenon, I call the two options for expressing the arguments associated with dative verbs the *Prepositional Dative construction* and the *Double Object construction*, as illustrated in (5).

(5) a. John gave a book to Mary. *Prepositional Dative construction*
b. John gave Mary a book. *Double Object construction*

Importantly, the choice of this syntactic domain was grounded on the fact that a number of authors (Gropen et al. 1989, Krifka 2003, Bresnan et al. 2007, Rappaport Hovav & Levin 2008, Stephens 2015, among many others) have shown that the dative alternation is not free, but subject to both semantic and pragmatic conditions. Particularly, Krifka (2003:3) points out that when the truth-conditions of the two constructions are "virtually identical", that gives Information Structure "a chance to determine the selection of the [prepositional dative] or [double object] construction in a particular context." Such claim was corroborated and strengthened by Bresnan et al. (2007), which argued that in actual use of the dative alternation, semantic biases may be overridden by factors of theme-recipient differentiation (cf. Collins 1995) — among which (most notably for our concerns here) is discourse givenness: "the dative structures tend to be chosen so that given referents precede nongiven referents in linear order" (p.75).

Having shown the basic properties of contrastive topicalization and how it may be realized in the dative alternation, I may now move on to questions of language acquisition. The paper is organized as follows. In Section 2, I present a brief background on the acquisition of elements of Information Structure, as well as on the acquisition of the dative alternation. In Section 3, I describe the elicited production experiment I conducted in order to assess whether contexts that allow for and/or require contrastive topicalization have an impact on children's use of the dative alternation. A general discussion is done in Section 4, and Section 5 concludes the paper.

2. ACQUISITIONAL BACKGROUND

In the Introduction it was shown that contrastive topicalization is a complex interface phenomenon, as it relates a topic and a focus with respect to sets of *contrastive alternatives* (in creating a sub-question strategy towards answering the question under discussion). Given that topicalization and focalization processes are anchored in the more general distinction between *given* and *new information* in discourse, they presuppose competence on the given-new distinction. That children are sensitive to such discourse information from a young age was demonstrated in a number of works, which I will briefly present in this section. My investigation of the acquisition of contrastive topicalization is thus grounded on evidence for early pragmatic competence.

The first question to be addressed is whether children are exposed (in the primary linguistic data) to enough cues to the distinction between given and new articulation. Fisher & Tokura (1995) conducted an experiment where mothers were asked to describe a puppet's actions both to an adult listener and to their 2-year-old infants. They observed that in mothers' speech both to the "competent" listener and to the "incompetent" listener, the cues for given information were similar, with respect to prosodic shape and sentential placement, when compared to first-mentioned elements. That child-directed speech also includes cues for topicality was claimed by Rohde & Frank (2014). By analyzing a video corpus of interactions between caregivers and children (6 to 20 months old), they observed that topic continuity is characterized both by linguistic markers (such as pronominalization and sentential position) and social cues of joint attention (such as eye gaze and pointing).

The next question is whether children indeed make use of the discursive information available in the input. That children are sensitive to the distinction between old and new information was argued for by e.g. Baker & Greenfield (1988). In a longitudinal study of four children (17 months to 2 years and 9 months old), they observed that the given-new distinction is operative already in the one-word

stage, with single-word utterances used to report new information, while the two-word stage expressed new information or a combination of given and new information, where totally presupposed information was omitted. A given-new distinction in young children was also observed by Dimroth & Narasimhan (2012).[2]

Considering that the given-new distinction is observable in young children's input and linguistic production, the question now is how they fare with topicalization and focalization, which are processes grounded on those broader concepts. With respect to focalization, Gökgöz et al. (2016) showed that contrastively focalized constituents in both speech (of children acquiring English; 3;09-6;04) and sign (of children acquiring American Sign Language; 4;07-8;0) were marked by a bundle of prosodic features. These results come from a production experiment where children were prompted to produce both neutral sentences and their counterparts where a constituent served as a correction. As for topicalization, it was shown by De Cat (2003, 2009) that French-acquiring children master its syntax and pragmatics as early as the age of 2 years and six months. Considering that in adult French, subject topics must be so marked via dislocation, the author observed both through corpus study (2003) and experimentally (2009) that children's subject topics are dislocated, while their dislocated subjects are compatible with topic interpretation.

De Cat (2009) additionally showed that children can distinguish the syntax of topics from the syntax of foci in French. In an elicitation study, she prompted 45 children (2;6–5;6) to produce sentences where the sentential subjects would have either topic or focus interpretation (depending on

[2] Dimroth & Narasimhan (2012), however, observed a non-adult-like new-before-given preference in German-acquiring children aged 3 to 5, and argued that the adult-like given-before-new preference is mastered by the age of 9. Their experiment tested the order of constituents in phrasal conjuncts. After seeing a box containing a previously-seen object and a newly-introduced object, and being asked what was in the box, children often reported the new object first. Children's new-before-given preference, in my view, may follow from the format of the experiment. The given information was not used to anchor or support the introduction of new information in discourse; rather, the given element and the new element were merely coordinated, while it is conceivable that the new object in the box would catch children's attention first. While that experiment reveals a given-new distinction in children's perception, it may not allow for firm conclusions about their discursive knowledge.

the condition). In the topic condition, the target items included three previously-introduced characters performing three different actions, and children were asked, "What are they doing now?". Children were expected to predicate about the given referents (in a contrastive manner, as there were three of them). In the focus condition, the target items included a new character in a previously-introduced scenario, and children were asked, "What is happening now?". Children were expected to introduce the new referent. The results show a success rate of over 90% — topics were encoded with topic syntax (with the use of e.g. dislocated NPs and subject clitics), and foci were encoded with focus syntax (with the use of e.g. full NPs in non-dislocated subject position and existential constructions).[3]

In the experiment that I conducted (to be described in the next section), the distinction between topic and focus fell upon the themes and recipients of the dative alternation. As was discussed in the Introduction, the alternation is subject to pragmatic conditions involving the theme-recipient differentiation, therefore it is a feasible domain in which to test contrastive topicalization. It is important to note, however, that the factors involved in the theme-recipient differentiation go beyond the ones of discursive nature. In particular, Bresnan et al. (2007) showed that in adult language a number of formal, semantic, and pragmatic properties of themes and recipients are aligned together in determining the choice of a dative construction — a fact often referred to as "harmonic alignment", illustrated in (6) below. Although they showed quantitatively (in a large corpus study) that the effects of the harmonic alignment are real, they also showed that each of these variables have an independent, significant effect in the choice of a dative construction. Particularly, out of 14 variables tested in that study, the three strongest predictors of the prepositional dative construction are "inanimacy of

[3] It is plausible that the competence with topicalization and focalization of children acquiring French differs from that of children acquiring English (particularly, the former might be expected to master such distinction earlier than the latter). This is an empirical question. The main point here is that early pragmatic competence of topicalization and focalization strategies in English is in principle possible (as it is attested in another language).

recipient", "non-pronominality of recipient", and "non-givenness of recipient".[4] An experiment designed to highlight the role of pragmatic factors (especially givenness/topicality) in speakers' choice of dative constructions must take into account other factors of the harmonic alignment, and ideally factor them out. Most importantly, the use of a contrastive situation is expected to considerably decrease subjects' use of pronouns (see footnote 4 for animacy; see Section 4.2 for pronominalization).

(6) Harmonic alignment with syntactic position (Bresnan et al. 2007:80)
   a. discourse given > nongiven
   b. pronoun > nonpronoun
   c. animate > inanimate
   d. definite > indefinite
   e. recipient shorter than theme > recipient longer than theme

As a pre-requisite for any pragmatic inquiries on the acquisition of the dative alternation, one critical question is when young children master the *syntax* of such constructions. Gropen et al. (1989) and Snyder & Stromswold (1997) have independently shown that the prepositional dative and the double object constructions are both mastered before the child's third birthday.[5] Therefore, I take the dative alternation to be an ideal empirical domain to test whether contrastive topicalization strategies affect children's word order choices. Initial evidence that informational factors influence children's use of the alternation was shown by Stephens (2015), in whose experiment a clear given-before-new preference emerged in children's production.

[4] The strongest predictor, "inanimacy of recipient", is left aside here, as I only tested the verb *give*, where the prototypical case is to have an animate recipient and an inanimate theme, which I kept constant (see Section 3).
[5] Although they are not acquired concurrently. Snyder & Stromswold (1997) show that the double object construction is in the general case mastered before the prepositional dative construction. It suffices for the purposes of my experiment that both constructions are present in children's grammar at the age range tested.

Stephens (2015) collected data from 64 children (3;10–5;04).[6] The test items were filmed silent vignettes where the agent, the theme, or the recipient was given information (previously introduced). After seeing the video, children were asked about the agent: "What did he/she do?". In the theme-given condition for the verb *give*, 100% of the (included) responses employed the prepositional dative construction. The recipient-given condition did not obtain a categorical effect, but obtained significantly more double object constructions than the control condition (agent given). Although her experiment shows a clear given-before-new preference, the author herself points out that it is inconclusive with respect to whether this is a direct effect of givenness, or an indirect effect of pronominalization — over 80% of given themes and recipients were realized by children as pronouns. As discussed above, pronominalization highly correlates with givenness (cf. harmonic alignment; see also Wasow 2002). Therefore, since givenness directly affects the choice of referring expression (full noun phrase or pronoun), her experiment does not provide convincing evidence that givenness by itself affects the choice of dative constructions in child language, as it does in adult language.

With the potential of preventing pronominalization of given themes and recipients, contrastive topicalization thus presents itself as a potential test domain to tease apart the effects of givenness from the effects of pronominalization in word order. As in De Cat's study with French children (but see section 4.2 for some qualifications on her results), the contrastive scenario is meant to enforce disambiguation through the use of full NPs (the use of full NPs instead of pronouns also being an indication of children's sensitivity to contrast).

The background is now set for the investigation of contrastive topicalization. The questions to be addressed include the following (note that these questions are intertwined):

[6] The discussion here is restricted to Experiment 1 of Stephens (2015). Stephens (2015) is a development of Stephens (2010), which I leave aside here for I consider that the coding and inclusion criteria of Stephens (2015) (namely to only include in the alternation the sentences where both theme and recipient appear) is more appropriate than the ones adopted in Stephens (2010).

(i) Are children sensitive to contrast in given information?[7]

(ii) If so, to what extent?

(iii) Do they distinguish topics from foci in scenarios of contrastive topicalization?

(iv) Do they have a given-before-new preference in scenarios of contrastive topicalization?

(v) If pragmatic conditions with respect to the necessity of contrast change, do children change their use (and/or frequency) of contrastive topicalization strategies?

(vi) What syntactic strategies do they use to mark contrastive topicalization?

These questions led to the elicited production experiment described in the next section.

3. THE EXPERIMENT

3.1. Participants

The data of this experiment come from ten children (3;11–5;02, M = 4;09) recruited through the UConn K.I.D.S. database[8] and tested in their respective childcares. An adult control group included ten UConn undergraduate students, recruited through the Department of Linguistics participant pool and tested on the university campus.

3.2. Materials

Test items consisted of child-appropriate stories narrated by one of two experimenters, presented to the children with the help of slide animations on a computer screen (see Appendices A and B). After hearing the story and simultaneously watching the slide presentation, children were

[7] Cf. Gökgöz et al. (2016), who show that children are sensitive to and produce contrast in information presented as *new* to the hearer (i.e. focus).

[8] "Kids in Developmental Science". More information at http://kids.uconn.edu.

prompted by a puppet (who was manipulated by the second experimenter and had missed the story) to say something about what they had seen.

Each story involved one main animate character (human or animal) in the role of *agent* (subject), which appeared first in the plot (as well as on the screen) and was explicitly conferred the discursive status of *aboutness topic* (e.g. "This is a story about Becky"). Each story also included three inanimate physical objects in the role of *themes* (direct objects) and three animate (human or animal) characters in the role of *recipients* (indirect objects). The agent performed three subsequent actions of *giving*, explicitly referred to by the mono-transitive expression *give away*. The action of *giving* was chosen due to *give* being the prototypical verb of the dative alternation. Moreover, the (near-)identical semantics of the two dative constructions with *give* allows for the role of Information Structure to be more clearly observable.[9]

The potential for contrastive topicalization fell upon the internal arguments of the verb, as each one theme was paired with one recipient (a theme-recipient pairing is referred to as a "token" of contrastive topicalization in the coding and analysis of the results). The architecture of the experiment is explained next.

The experiment consisted of three factors with two levels each (i.e., a 2x(2x2) design), as schematized in (7).

(7)	a.	Givenness	between subjects	{Themes Given}, {Recipients Given}
	b.	Contrast Status	within subjects	{Optional Contrast}, {Enforced Contrast}
	c.	Ditransitive Prompt	within subjects	{No Prompt}, {With Prompt}

[9] On that, Krifka (2003:13) writes, "Information Structure appears to be the decisive factor for verbs like *give* that essentially mean the same in the [prepositional dative] construal and in the [double object] construal", while for Snyder & Stromswold (1997:291) "with *give* it is largely a matter of choice which dative form one uses." This "choice", I intend to demonstrate, is heavily influenced by Information Structure.

The first factor is **Givenness**. In one level (**Themes Given**), all three themes (direct objects) of the story were presented before any recipients appeared. Themes were mentioned twice in the plot of the story, and after the second mention of each theme, its corresponding recipient had its only mention (while appearing on the screen). A plot example is in (8).

(8) *Aboutness*: This is a story about Becky.
Scenario: Becky is a sports teacher. Today she is teaching in the circus!
Topics: She brought several balls with her:
a soccer ball, **a basketball**, and **a football**.
Give: Becky will teach the animals of the circus.
So she wants to **give** these balls away.
Focus 1: Look! Becky is grabbing **the soccer ball**! Oh, here comes ***a lion***!
Focus 2: And now Becky is grabbing **the basketball**! Look, that's ***a zebra***!
Focus 3: Finally, Becky is grabbing **the football**! And here comes ***an elephant***!
End: That's how Becky takes care of her circus! She has a lot of fun there!

After the plot, when the often-absent puppet finally shows up, each theme received one more mention by the first experimenter, while recipients were only referred to with a collective (or umbrella) term (e.g. "animals"). The puppet's last line emphasized the topicality of the themes with a collective (or umbrella) term (e.g. "balls"), but crucially the puppet's prompt question was about the agent's action(s) (e.g. "What did Becky do?"). The end of a puppet's interaction is illustrated in (9) below.

(9) EXP: This was a story about Becky.
She teaches sports in the circus and she had a few balls to **give** away:
a soccer ball, **a basketball**, and **a football**.
Then the animals showed up in the circus.
PUPPET: That is so cool! Hey, CHILD [*name*], you saw the story!
I wanna know what happened with **the balls**.
So please tell me: *what did Becky do*?

The *Themes Given* level was meant to confer given status and contrastive topic potential to the themes, with the recipients being their potential associated foci. In order not to tax children's memory, all participants of the story remained accessible to them, as the last scene of the plot (which showed all three theme-recipient pairings) was still visible on the computer screen. However, it is important to emphasize, the recipients were unknown by the puppet. The second level (**Recipients Given**) followed the same pattern, but crucially had the discursive status of themes and recipients switched. Recipients appeared first and were given contrastive topic potential, whereas themes were given focus potential. A plot of a *Recipients Given* story is illustrated in (10). The discursive status of the agents remained constant across the two levels of the *Givenness* factor.[10]

(10) *Aboutness*: This is a story about Becky.
Scenario: Becky has a big circus. She does lots of fun stuff there!
Topics: One thing she does is take very good care of the animals:
a lion, **a zebra**, and **an elephant**.
Give: Becky wants to teach them how to play sports!
She has a few things to **give** away that might help.
Focus 1: Look! Becky is going to **the lion**. "Here's ***a soccer ball*** for you!"
Focus 2: Oh, now Becky is going to **the zebra**! "You can have ***a basketball***!"
Focus 3: Finally, Becky is going to **the elephant**! "And here's ***a football***!"
End: That's how Becky takes care of her circus! She has a lot of fun there!

The puppet's prompt question about the agent (rather than the potential contrastive topics) was meant to leave for the child to decide whether she would report one single event of giving or divide it into sub-events, in which case contrastive topicalization was expected (cf. discussion on Büring's sub-question strategies in the Introduction). Children were expected to provide an answer

[10] See Appendix A for examples of plots and Appendix B for examples of slide animations.

that employed a ditransitive construction with the verb *give*. Themes-Given conditions were expected to prompt the prepositional dative construction (e.g. "Becky gave the balls to the animals" or "Becky gave the soccer ball to the lion, the basketball to the zebra, and the football to the elephant"), while Recipients-Given conditions were expected to prompt the double object construction (e.g. "Becky gave the animals (some) balls" or "Becky gave the lion a soccer ball, the zebra a basketball, and the elephant a football").

The second factor is **Contrast Status**. In one level (**Optional Contrast**), the context was such that it did not really matter what each character was given in the end (i.e. there was no clear or needed association between a theme and a recipient). This level included a puppet that was not so demanding (this puppet would miss the story because he was too sleepy that day and would always take a nap during the story time). This puppet simply inquired of the child about the agent's action. The example in (8)-(9) above illustrates an *Optional Contrast* story. In the second level (**Enforced Contrast**), the plot was such that it did matter that the pairing between a theme and a recipient was done properly by the agent (e.g. the bones must have been given to the dog / the dog must have been given bones). A different puppet was used in the conditions of this level, one that was more demanding and keen to learn (this puppet was presented as smart and would miss the stories because he would always have to attend a class during the story time). The plot and the puppet's question and needs enforced that the child stated what happened to each of the objects/characters. He would inquire of the child about the agent's action(s) in a manner that expected a more comprehensive answer. The example in (11) illustrates the end (i.e. the experimenter-puppet interaction) of an *Enforced Contrast* story.

(11) EXP: This was a story about Bob the farmer.
He had a farm, and he had different kinds of animal foods to **give** away:
bones, **fish**, and **bananas**.
Then the animals showed up in the farm.

PUPPET: That is so nice! I wanna have a farm too!
I need to know how to do things around the farm in the right way!
Hey, CHILD [*name*], you know the right way to run a farm!
I need to know what happened with **the animal foods**.
So please tell me: *what did Bob do*?

Children were expected to provide more answers with the expected construction (prepositional datives for themes-given, double objects for recipients-given) in the *Enforced Contrast* conditions than in the *Optional Contrast* conditions, as the former increases the necessity to break down the *giving* event into sub-events, therefore increasing the necessity to distinguish topics from foci.

The third factor is **Ditransitive Prompt**. In the first level (**No Prompt**), the expected ditransitive construction was employed neither in the plot nor in the experimenter-puppet interaction. That was the case of the stories exemplified above. In the second level (**With Prompt**), the expected ditransitive construction was employed once by the experimenter and once by the puppet (both after the plot, during the experimenter-puppet interaction), in accordance to *Givenness* (prompts that mismatched Givenness were not employed, in order the keep the interactions as felicitous as possible). A prompt was only used for the first theme-recipient pairing, as illustrated in (12) (which is the end of a themes-given, optional contrast story).

(12) EXP: This was a story about Grandma.
She was at home, and she had a number of desserts to **give** away:
a candy, **an ice-cream**, and **a cookie**.
Then the kids showed up in the house.
She gave **the candy** to ***the girl***…
PUPPET: [*Puppet interrupts*] Another yummy story! Hey, CHILD [*name*], you saw the story!
I wanna know what happened with **the desserts**.
I know that Grandma gave **the candy** to ***the girl***,
but please tell me: *what else did she do*?

Children were expected to follow the prompt in addressing the remaining two theme-recipient pairings of the story, therefore increasing the number of expected ditransitive constructions in the *With Prompt* conditions in comparison to the *No Prompt* conditions.

3.3. Procedure

The experiment was conducted in the following way. Children were divided into two groups of five subjects each. Children in Group 1 (3;11–5;0, M = 4;06) were shown the *Themes-given* conditions and children in Group 2 (4;07–5;02, M = 5;0) were shown the *Recipients-given* conditions.[11] This division was made for the practical reasons of logistics and feasibility and was not expected to affect the results, given that the two syntactic constructions targeted are acquired at least one year before the age tested in this experiment (cf. Section 2 above). The experiment was divided into two sessions, conducted in different days up to one week apart, again for practical reasons (in order for each session not to exceed 15-20 minutes). *No Prompt* conditions were considered "pragmatically weaker" than *With Prompt* conditions, in the sense that the latter were expected to give rise to a higher number of expected constructions. Therefore, the choice was made to present *No Prompt* conditions in the first session and *With Prompt* conditions in the second session, in order to allow for a crescendo of the "pragmatic strength".[12]

The flow of the experiment is schematized in (13) and (14) below. Each test condition consisted of a set of three stories, and before each set the child saw a training story, which served the purpose of introducing the puppet of that set (training stories only included one theme-recipient pairing). Within a session, conditions were also presented in order of "pragmatic strength", i.e. *Enforced*

[11] A story presented to Group 1 and its couterpart presented to Group 2 had exactly the same characters and a similar plot (to the extent possible, given that they had to vary on what was given topic potential and what was given focus potential).
[12] The expression "pragmatic strength" is used atheoretically here and simply refers to the expected rate of expected responses.

Contrast conditions were expected to give rise to a higher number of expected constructions than *Optional Contrast* conditions, and therefore were presented in the second half of the session. In the first session, the first set of stories (Set 1) included [Optional Contrast, No Prompt] stories, and Set 2 included [Enforced Contrast, No Prompt] stories, with a different *Givenness* value for each of the two groups. In the second session, Set 3 included [Optional Contrast, With Prompt] stories and Set 4 included [Enforced Contrast, With Prompt] stories.[13]

(13) ***Session 1***

Group 1

a.	Training Th-Given	*1 story*	*Puppet A introduced*	
b.	Th-Given, OptC, NoP	*3 stories (test items)*	*Puppet A*	***Set 1***
c.	Training Th-Given	*1 story*	*Puppet B introduced*	
d.	Th-Given, EnfC, NoP	*3 stories (test items)*	*Puppet B*	***Set 2***

Group 2

d.	Training Rec-Given	*1 story*	*Puppet A introduced*	
e.	Rec-Given, OptC, NoP	*3 stories (test items)*	*Puppet A*	***Set 1***
f.	Training Rec-Given	*1 story*	*Puppet B introduced*	
g.	Rec-Given, EnfC, NoP	*3 stories (test items)*	*Puppet B*	***Set 2***

[13] While the experiment was designed having in mind the "pragmatic strength" of the conditions (with Set 1 being the weakest and Set 4 the strongest), a priori I had no compelling theoretical reasons to expect either of Set 2 and Set 3 to be stronger than the other (i.e. more likely to give rise to the expected construction). However, Jon Gajewski (p.c.) points out that speakers tend to be more congruent to the linguistic discourse than the situational context, which would make Set 3 stronger than Set 2. This prediction was borne out by the results presented in Section 4.

(14) ***Session 2***

Group 1

a.	Training Th-Given	*1 story*	*Puppet A' introduced*	
b.	Th-Given, OptC, W/P	*3 stories (test items)*	*Puppet A'*	***Set 3***
c.	Training Th-Given	*1 story*	*Puppet B' introduced*	
d.	Th-Given, EnfC, W/P	*3 stories (test items)*	*Puppet B'*	***Set 4***

Group 2

d.	Training Rec-Given	*1 story*	*Puppet A' introduced*	
e.	Rec-Given, OptC, W/P	*3 stories (test items)*	*Puppet A'*	***Set 3***
f.	Training Rec-Given	*1 story*	*Puppet B' introduced*	
g.	Rec-Given, EnfC, W/P	*3 stories (test items)*	*Puppet B'*	***Set 4***

All sessions were recorded in audio and video and subject's responses were transcribed and coded manually. In the next section, I present the coding criteria.

3.4. Coding

Before going into to the results of the experiment, I will present the coding criteria used in the quantitative analysis. Recall from the last section that, when asked "What did [the agent] do?", subjects in principle had the choice to report the agent's action of giving as one single event or divide it into sub-events. If a subject chose to report a single event with a single (simple) sentence (and crucially the theme-recipient pairings were not explicit), his/her answer fell into the category labeled "1 for All" (i.e. one sentence for all theme-recipient pairings), as illustrated in (15) with child data. Answers in this category were further coded with respect to the possible dative constructions. Prepositional dative constructions were coded "Th" (i.e. theme first) and double object constructions were coded "Rec" (i.e. recipient first). Any answers that did not include a ditransitive verb and both internal arguments

were coded as "Other" (i.e. answers that for any reason did not distinguish the order of the internal arguments of the ditransitive verb).

(15) **1 for All**

a.	Th	*She gave the balls to them*	(A1G1, 4;09)
		He gave a doll and a guitar to the princesses	(N1G2, 5;0)
b.	Rec	*He gave all the animals footballs.*	(S1G2, 5;01)
		He gave them a cupcake and a hotdog	(K1G2, 5;01)
c.	Other	*He gave them away forever*	(E1G1, 4;03)
		Santa Claus gave away a tablet, a doll, and a piano	(E1G2, 4;07)

When subjects divided the agent's action into sub-events and presented clear theme-recipient pairings, each pairing was considered a "token" (i.e. an instance of contrastive topicalization), as illustrated in (16) with child data. Tokens were also divided into three categories: Prepositional dative ("Th"), double object ("Rec"), and "Other". A token slot was coded as "Other" if for any reason a given theme-recipient pairing was missing (no token provided) or was unclear with respect to the order of the internal arguments (e.g. if the answer did not contain both theme and recipient).[14]

(16) **Tokens**

a.	Th	*He gave the bucket to the cleaner (…)*	(C1G1, 5;0)
		(…) and the hat to the whale	(M1G1, 4;05)
b.	Rec	*He gave the dog bones (…)*	(E1G2, 4;07)
		(…) and he gave the whale a hat	(S1G2, 5;01)
c.	Other	*(…) and the doctor give a... a doctor car (…)*	(S1G2, 5;01)
		Gave them away	(C1G1, 5;0)

[14] If a "1 for all" answer was provided instead of individual tokens, all token slots of the story were assigned the value "Other" (missing).

Answers that made use of tokens (theme-recipient pairings) were further classified with respect to "Token Majority". The two sets of stories tested on the first experiment session (Set 1 and Set 2) had three token slots available per story (as there were three themes and three recipients), while the stories tested on the second session (Set 3 and Set 4) had two token slots available per story (as the first theme-recipient pairing was used as a prompt). For all sets, the criterion chosen was a simple majority: if a story had at least two tokens with the same value, that story would be counted as having that value as its Token Majority. If no majority could be established or there were no tokens, the answer fell under the label "Other". Child examples are provided in (17).

(17) **Token Majority**

a. Th	*and the scarf to the turtle* (Th) *and the hat to the whale* (Th)	(M1G1, 4;05)
b. Rec	*John the Mayor gave the policeman a police car* (Rec)*, and the doctor give a... a doctor car* (Oth)*, and the fireman a fireman… truck* (Rec)	(S1G2, 5;01)
c. Other	*He gave the gifts to them* (1 for All)	(A1G1, 4;09)

With the above classification, one given story (test item) could not have at the same time a specified value ("Th" or "Rec") for "1 for All" and a specified value ("Th" or "Rec") for "Token Majority" (as these two broad categories cross-cut whether the answer sub-divides the giving event or not). However, a given story could lack a specified value for both (falling under the "Other" label for both, e.g. if tokens were used but no majority could be established or no answer at all was provided), although that was rarely the case (see Appendix C for an example of a subject's coding chart).

Answers were additionally coded with respect to being the expected construction or not. For Group 1, theme-first ("Th") answers were coded as "Yes"/expected, while recipient-first ("Rec") and "other" answers were coded as "No"/unexpected. Conversely, for Group 2, recipient-first ("Rec")

answers were coded as "Yes"/expected, while theme-first ("Th") and "other" answers were coded as "No"/unexpected. We may now proceed to the results.

3.5. Results

In order to assess subjects' overall use of the dative constructions to distinguish given/topical elements from new/focal elements, regardless of contrastive topicalization, I combined in Figure 1 the results of the categories "1 for All" and "Token Majority" (recall that the answer to one given story has a value for at most one of the two categories). Each group includes a total of 60 answers (5 subjects x 12 stories). Adults who saw the Themes-Given conditions (Group 1) strongly preferred prepositional dative constructions (84.5%|R, 81.7%|A).[15] On the other hand, adults who saw the Recipients-Given conditions (Group 2) strongly preferred double object constructions (75.9%|R, 73.3%|A). Even though children's data include a substantially higher rate of "Other" responses (30.8%|A), they revealed the same preferences as adults. In Group 1, a categorical preference for the prepositional dative construction emerged (100%|R, 66.7%|A). Group 2 preferred the double object construction (62.2%|R, 46.7%|A).

I will now present the results for each of the three factors of the experiment, leaving aside the answers coded as "1 for All". Here I consider only the counts of individual "tokens" of contrastive topicalization, that is, overt pairings between themes and their corresponding recipients (or vice-versa).[16]

[15] Percentages will be given in the format (X%|R, Y%|A), which reads as "X% of Relevant answers (one of the two dative constructions), Y% of All answers". I chose to include answers in "Other" categories in the graphs and tables because of the questions raised in this experiment. It is important to know *where* the higher rates of relevant answers appear, especially with respect to the "pragmatic strength" of the conditions, which increased as the experiment progressed (from Set of stories 1 to Set of stories 4).

[16] It is important to emphasize that the "1 for All" and "Token Majority" coding is only relevant for the "Overall" assessment of the results, which investigates the distinction between topics and foci regardless of contrastive topicalization. The results concerning contrastive topicalization tokens, on the other hand, are solely based on the count of individual theme-recipient pairings.

1. Givenness: Figure 2 shows that adults employed contrastive topicalization strategies in over 90% of the 150 possible cases, while children did so in only about 50% of the cases. However, adults and children showed similar preferences with respect to the choice of a dative construction according to the context (i.e. the topic-focus distinction). Adults in Group 1 preferred prepositional datives in their contrastive topic tokens (81.9%|R, 78.7%|A), while those in Group 2 mostly opted for double objects (72.7%|R, 67.3%|A). Children in Group 1 categorically chose prepositional datives (100%|R, 51.3%|A), while those in Group 2 preferred double objects (58.7%|R, 31.3%|A).

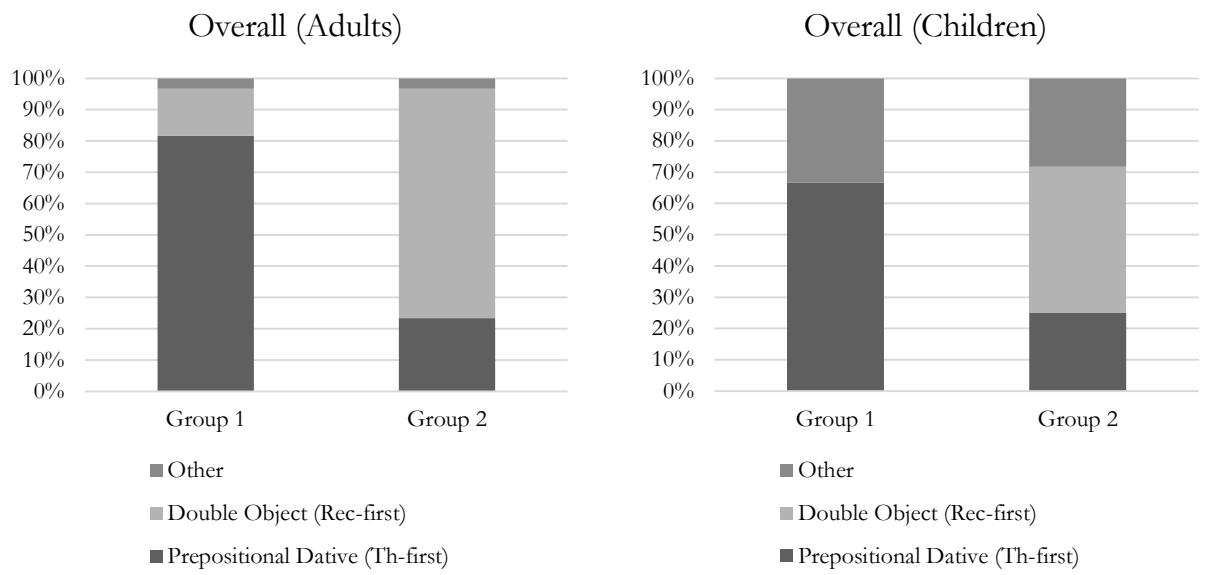
2. Contrast Status: Figures 3 and 4 show subjects' construction preferences for each set of stories.[17] Conditions with Optional Contrast appeared on the first half of each session of the experiment (Sets 1 and 3), while conditions with Enforced Contrast appeared on the second half of each session (Sets 2 and 4). The preference of adults in Group 1 for prepositional datives went from [78.6%|R, 73.3%|A] in Sets 1 and 3 (combined), to [85.1%|R, 84%|A] in Sets 2 and 4 (combined) (see Figure 5). The preference of adults in Group 2 for double objects went from [64%|R, 54.7%|A] in Sets 1 and 3 (combined), to [80%|R, 80%|A] in Sets 2 and 4 (combined) (see Figure 6). As seen above, children in Group 1 never produced double object constructions, but the effect of Contrast Status is seen in their overall use of prepositional dative tokens — from [100%|R, 45.3%|A] in Sets 1 and 3 (combined), to [100%|R, 57.3%|A] in Sets 2 and 4 (combined) (see Figure 5). In children of Group 2, the overall use of double objects increased with the enforcement of contrast, although proportionally to prepositional datives it decreased (i.e. the overall use of prepositional datives also

[17] Sets 1 and 2 could each elicit up to 45 contrastive topicalization tokens, while Sets 3 and 4 could each elicit up to 30 tokens. See Appendix D for overall results, with the categories "1 for All" and "Token Majority" combined.

increased) — double objects went from [63.6%|R, 28%|A] in Sets 1 and 3 (combined), to [55.3%|R, 34.7%|A] in Sets 2 and 4 (combined) (see Figure 6).[18]

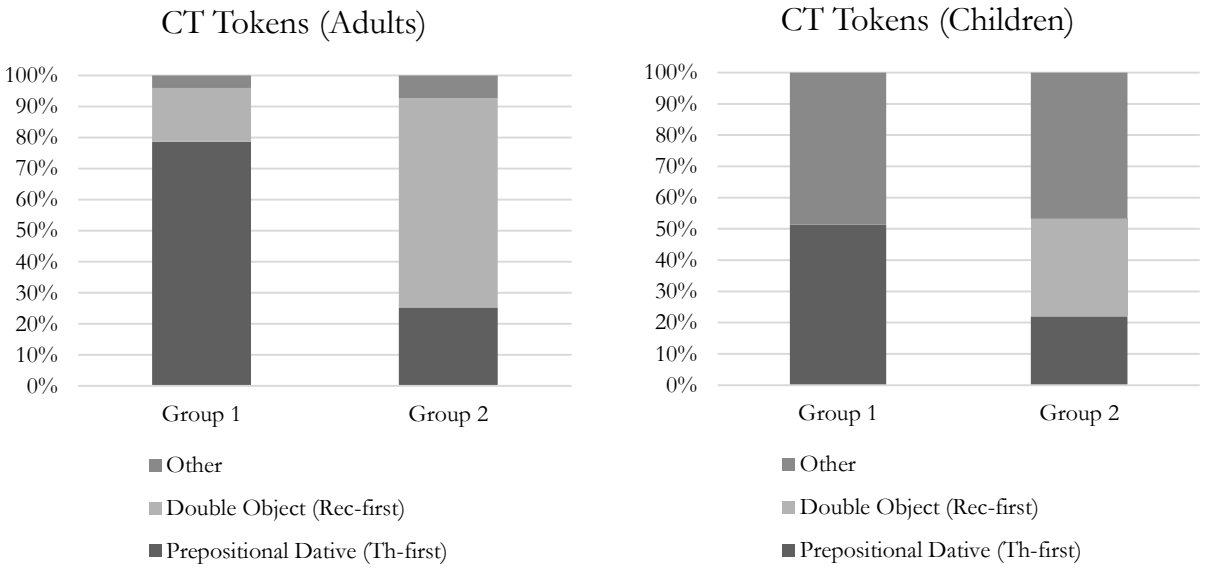
3. Ditransitive Prompt: With respect to the role of the absence or presence of a Ditransitive Prompt in the stories, the overall picture that emerges from Figures 3 and 4 is that conditions that included a prompt (Sets 3 and 4, presented in the second session of the experiment) elicited a much higher number of the expected constructions than the conditions that did not include a prompt (Sets 1 and 2), in adults and children alike. The preference of adults in Group 1 for the prepositional dative construction went from [69%|R, 64.4%|A] in Sets 1 and 2 (combined), to [100%|R, 100%|A] in Sets 3 and 4 (combined) (see Figure 7), whereas the preference of adults in Group 2 for the double object construction went from [63%|R, 56.7%|A] in Sets 1 and 2 (combined) to [86.2%|R, 83.3%|A] in Sets 3 and 4 (combined) (see Figure 8). The preference of children in Group 1 for the prepositional dative construction went from [100%|R, 33.3%|A] in Sets 1 and 2 (combined) to [100%|R, 78.3%|A] in Sets 3 and 4 (combined). Note that, although the ratio of prepositional datives over double objects remained constant at 1:0, the use of prepositional datives was much more frequent when the prompt was used (see Figure 7). Children in Group 2 chose the double object construction in [48.8%|R, 23.3%|A] in Sets 1 and 2 (combined), while jumping to [70.3%|R, 43.3%|A] in Sets 3 and 4 (combined) (see Figure 8).

[18] This is likely due to the unexpected results of Set 2 of Children in Group 2, where prepositional datives outnumber the expected double objects. Regardless of construction choice, enforcement of contrast increased the number of relevant answers (i.e. the use of contrastive topicalization) throughout.



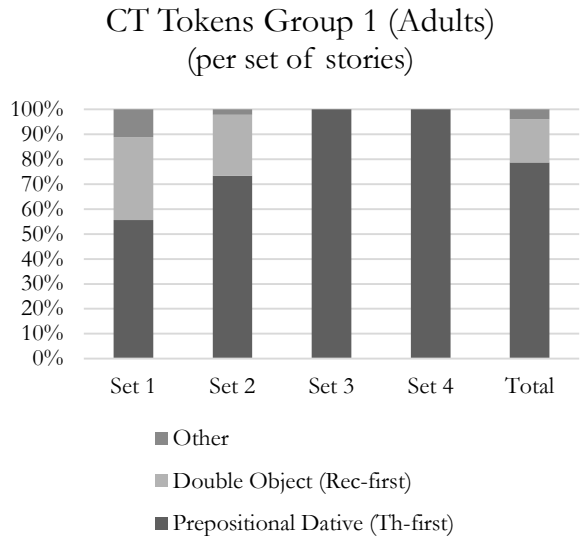
Overall	Adults Group 1	Adults Group 2	Children Group 1	Children Group 2
Prepositional Dative (Th-first)	(81.7%) 49	14 (23.3%)	(66.7%) 40	15 (25%)
Double Object (Rec-first)	(15%) 9	44 (73.3%)	(0%) 0	28 (46.7%)
Other	(3.3%) 2	2 (3.3%)	(33.3%) 20	17 (28.3%)

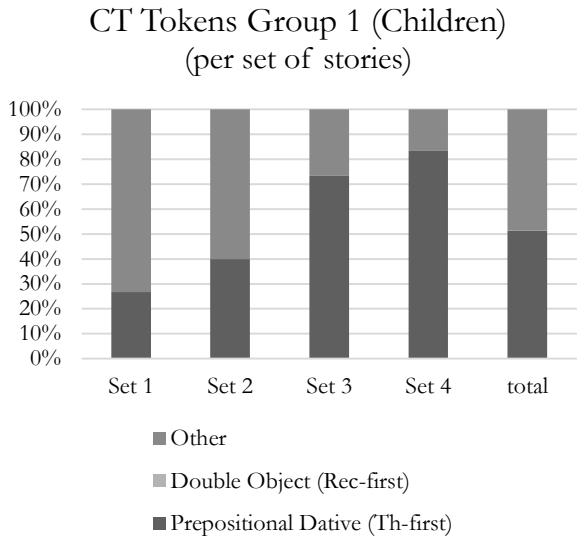
Fig. 1: Overall results (categories "1 for All" and "Token Majority" combined)



Contrastive Topic Tokens	Adults Group 1	Adults Group 2	Children Group 1	Children Group 2
Prepositional Dative (Th-first)	(78.7%) 118	38 (25.3%)	(51.3%) 77	33 (22%)
Double Object (Rec-first)	(17.3%) 26	101 (67.3%)	(0%) 0	47 (31.3%)
Other	(4%) 6	11 (7.3%)	(48.7%) 73	70 (46.7%)

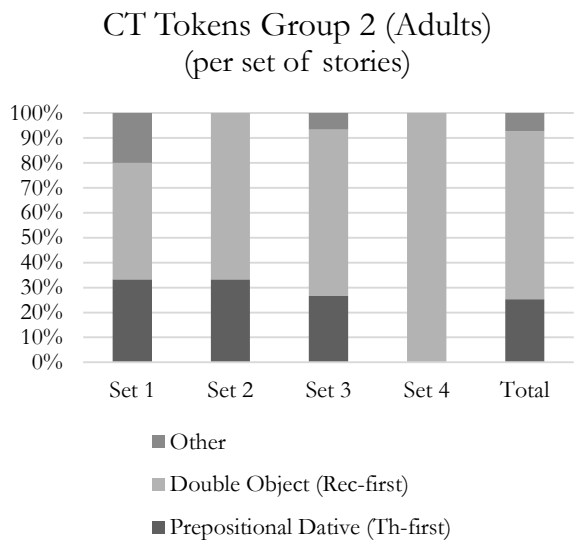
Fig. 2: Contrastive Topic Tokens

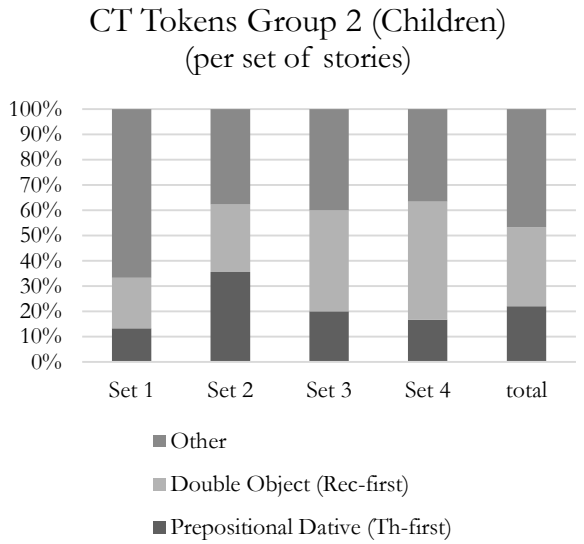




CT Tokens (per set)	Adults Group 1					Children Group 1				
	Set1	Set2	Set 3	Set 4	**Total**	Set 1	Set 2	Set 3	Set 4	**Total**
Prep. Dative (Th-first)	25 (55.6%)	33 (73.3%)	30 (100%)	30 (100%)	**118 (78.7%)**	12 (26.7%)	18 (40%)	22 (73.3%)	25 (83.3%)	**77 (51.3%)**
Doub. Object (Rec-first)	15 (33.3%)	11 (24.4%)	0 (0%)	0 (0%)	**26 (17.3%)**	0 (0%)	0 (0%)	0 (0%)	0 (0%)	**0 (0%)**
Other	5 (11.1%)	1 (2.2%)	0 (0%)	0 (0%)	**6 (4%)**	33 (73.3%)	27 (60%)	8 (26.7%)	5 (16.7%)	**73 (48.7%)**

Fig. 3: Contrastive Topic Tokens per set of stories (Group 1)





CT Tokens (per set)	Adults Group 2					Children Group 2				
	Set1	Set2	Set 3	Set 4	**Total**	Set 1	Set 2	Set 3	Set 4	**Total**
Prep. Dative (Th-first)	15 (33.3%)	15 (33.3%)	8 (26.7%)	0 (0%)	**38 (25.3%)**	6 (13.3%)	16 (35.6%)	6 (20%)	5 (16.7%)	**33 (22%)**
Doub. Object (Rec-first)	21 (46.7%)	30 (66.7%)	20 (66.7%)	30 (100%)	**101 (67.3%)**	9 (20%)	12 (26.7%)	12 (40%)	14 (46.7%)	**47 (31.3%)**
Other	9 (20%)	0 (0%)	2 (6.7%)	0 (0%)	**11 (7.3%)**	30 (66.7%)	17 (37.8%)	12 (40%)	11 (36.7%)	**70 (46.7%)**

Fig. 4: Contrastive Topic Tokens per set of stories (Group 2)

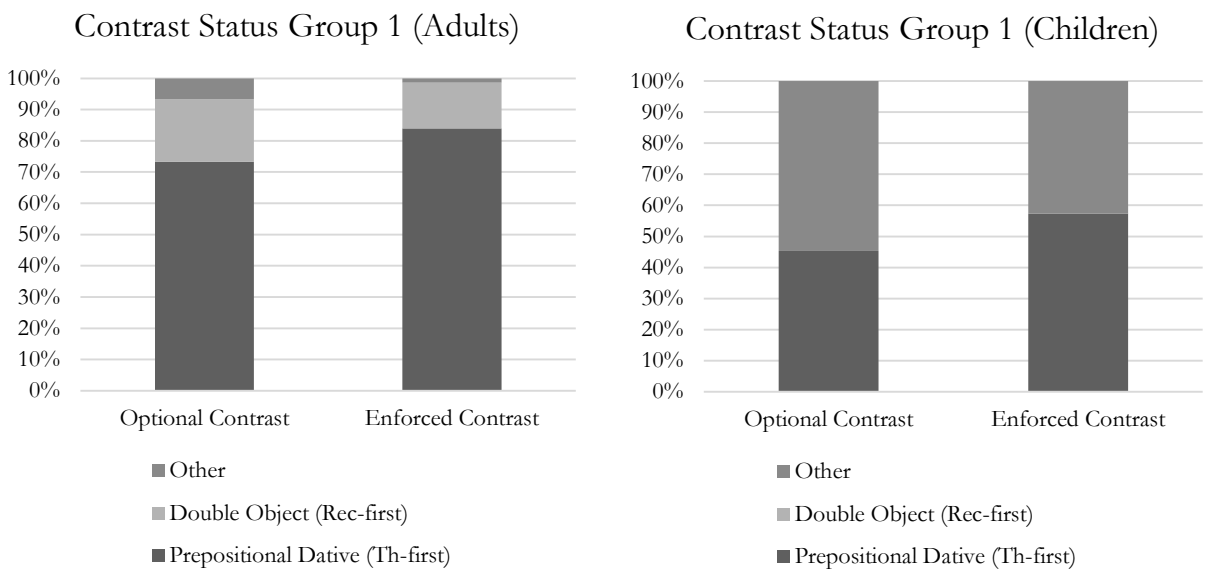


Fig. 5: Contrast Status (Group 1)

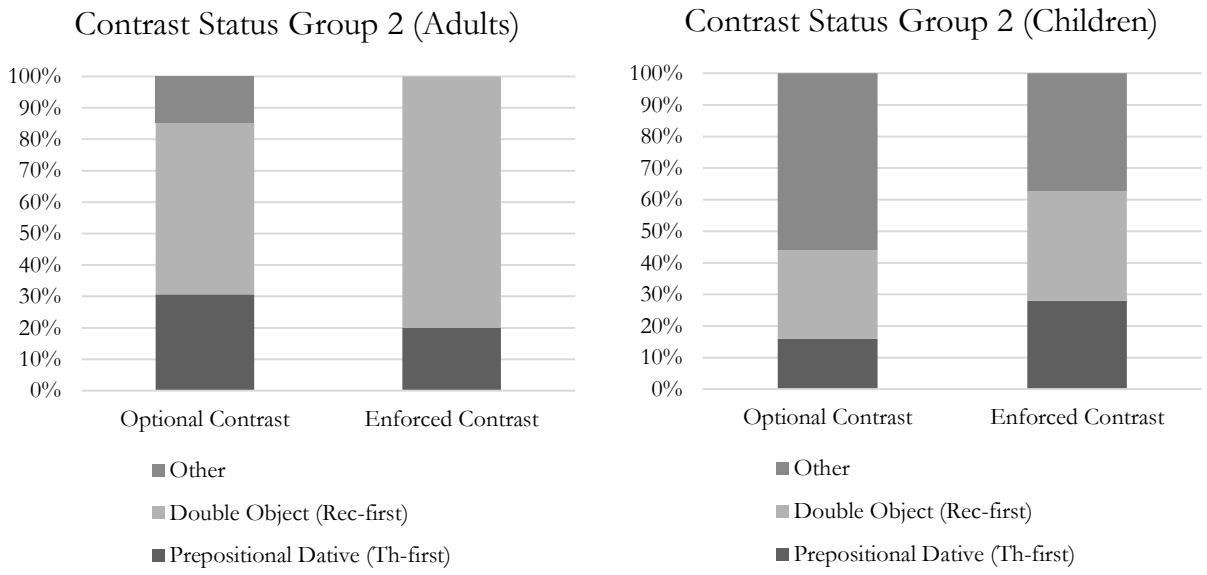


Fig. 6: Contrast Status (Group 2)

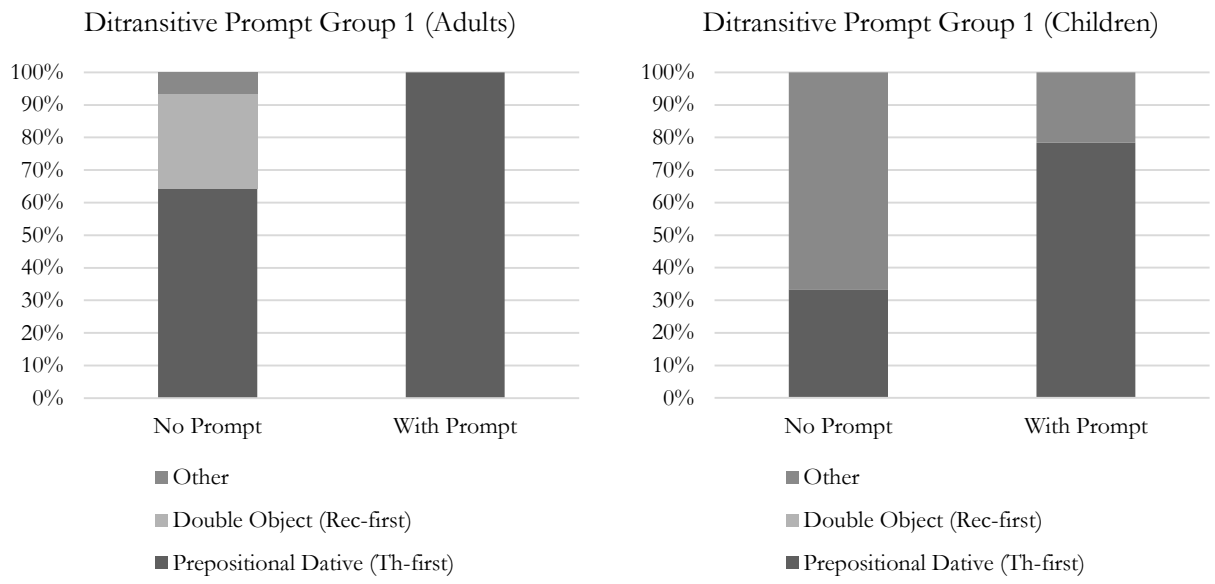


Fig. 7: Ditransitive Prompt (Group 1)

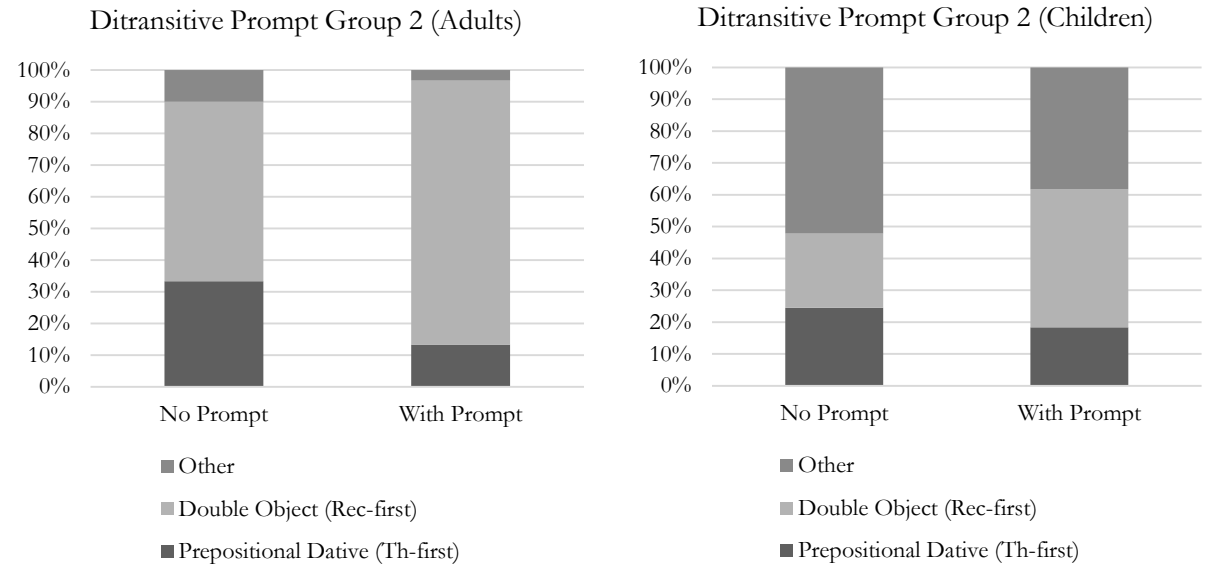


Fig. 8: Ditransitive Prompt (Group 2)

In order to assess the significance of the results presented above, I made use of generalized linear mixed models (GLMM) and Asymptotic Wald Tests.[19] In order to test the significance of the factor *Givenness* in the adult data, that is, the difference between Group 1 and Group 2 shown in Figure 1, I excluded the four "other"-type answers and I ran a binomial model with respect to the overall answers ("Th"=63, "Rec"=53). The factor *Givenness*, as expected, was found to be a significant predictor of the dative construction. Prepositional datives in Group 2 were significantly less frequent than in Group 1 (Z=–2.600, p=.00931).

Recall from Figure 1 that Group 1 of children did not produce a single double object construction. In order for the model to converge, I had to artificially add one point of variation in the data (noise), which I did by replacing one "other"-type answer by a "Rec" answer in one subject of Group 1. Again excluding all "other"-type answers ("Th"=55, "Rec"=29), I ran a binomial model to predict the type of answer by the factor *Givenness*. As in the adult data, prepositional datives in Group 2 were significantly less frequent than in Group 1 (Z=–2.268, p=.0233).

When considering only the cases where contrastive topicalization was used, that is, only the count of contrastive topicalization tokens shown in Figure 2, the GLMMs also found a significant difference between Group 1 and Group 2, especially in children. I again excluded the "other"-type answers (adults: "Th"=156, "Rec"=127; children: "Th"=110, "Rec"=48, including 1 noisy "Rec" for the same reason as above) and I ran a binomial model to predict the type of answer by the factor *Givenness*. In the adult data, prepositional datives in Group 2 were significantly less frequent than in Group 1 (Z=–2.559, p=.0105). The same result obtained in the child data (Z=–3.067, p=.00217).

In order to test for effects of the factors *Contrast Status* and *Ditransitive Prompt*, which were shown in Figures 5 to 8, I collapsed the data of Group 1 and Group 2 (in each of the adult and child

[19] GLM modeling was performed using *R* (version 3.2.5; R Foundation for Statistical Computing, 2016) and the *lme4* software package (Bates et al. 2015). I used the function *glmer* with *logit* as the link function and *subject* as a random effect. I am particularly indebted to William Snyder for his help with the statistical analysis.

data) by coding whether the construction/token was expected or not (according to the *Givenness* value of each group). More specifically, all "Th" answers in Group 1 were counted as "Yes"/expected (with "Rec" and "Other" being counted as "No"/unexpected), whereas all "Rec" answers in Group 2 were counted as "Yes"/expected (with "Th" and "Other" being counted as "No"/unexpected). In total, the adult data had 219 expected tokens and 81 unexpected (total=300), whereas the child data had 124 expected tokens and 176 unexpected (total=300) (see Figure 2).

A binomial GLMM with the factor *Contrast Status* was fitted to the adult data. The model based on expected answers/tokens with Group 1 and Group 2 combined did not converge. I therefore ran an alternative model based on type of construction ("Th"=156 or "Rec"=127, excluding "other"-type answers), and searched for an interaction between Group and Contrast Status. The latter model converged, and there was a significant interaction ($Z=-2.721$, $p=0.0065$). In the child data, a model based on expected answers/tokens with Group 1 and Group 2 combined did converge, and unexpected answers were significantly less frequent in the Enforced Contrast stories than the Optional Contrast stories ($Z=-1.993$, $p=.0462$).

The effect of the factor *Prompt* was found to be highly significant, in adults and children alike. A binomial model (with +/- Prompt as a fixed effect) found that unexpected answers were significantly less frequent in With-Prompt stories than in No-Prompt stories ($Z=-6.172$, $p<.0001$). A similar result obtained in the child data ($Z=-6.301$, $p<.0001$).[20]

[20] I attempted to test for an interaction between *Contrast Status* and *Prompt* in both the adult data and the child data. Unfortunately the model based on expectedness of the adults' answers failed to converge, but the corresponding model for the children did converge, and there was no significant interaction.

4. DISCUSSION

4.1. On the results

Recall from Section 2 that the investigation of contrastive topicalization is embedded in the more general discussion about whether children are sensitive to the distinction between given and new information in discourse. The statistical significance of the results shown in Figure 1 corroborates the suggestion made by Stephens (2015) that children's choice of dative constructions reflects their ability to distinguish given information from new information — that is, children obey the adult-like given-before-new preference in choosing between the prepositional dative construction and the double object construction. Considering only the cases of contrastive topicalization (Figure 2), a very similar result obtains, pointing to the conclusion that children's given-new distinction is reflected on their choice of topic and focus in scenarios of contrastive topicalization (that is, when themes were topics, prepositional datives were categorically preferred, and when recipients were topics, double objects were preferred).

One question raised by the experiment is whether the manipulation of pragmatic conditions affects children's overall use of contrastive topicalization. As shown above, the pragmatic strengthening of the conditions (by enforcement of contrast and especially by the use of a ditransitive prompt) significantly increased the use of the dative construction that better matched the context according to givenness/topicality (i.e. the "expected" answer) in the child data.

The manipulation of *Contrast Status* had an effect on both adults and children. Like adults, children at the age of four and a half can assess the situational context and identify the necessity of contrast (which they did by establishing the proper theme-recipient pairings; see Figures 5 and 6).

The use of a *Ditransitive Prompt* had a larger effect in predicting the use of the expected dative construction (Figures 7 and 8). According to Bresnan et al. (2007), structural parallelism — that is,

"the existence of the same kind of structure in the same dialogue" (p.77) — is one of the conditioning factors of the dative alternation in adult language. The current experiment replicated that finding, while extending it to child language.

On a brief note, the comparison between the conditions *Contrast Status* and *Ditransitive Prompt* seems to suggest that children are more coherent to the linguistic discourse than the situational context. That is, the exact shape of their interlocutor's (i.e. the puppet's) question had a stronger effect on their answers than the puppet's (somewhat) implicit informational needs (to know whether the theme-recipient pairings were done properly by the agent of the story). It is important to note here that even though the use of a ditransitive construction in the puppet's prompt expectedly triggered the same construction in the child's speech (that is, the prompt functions as syntactic priming), it says nothing about whether children would report the two remaining theme-recipient pairings with one single dative construction or two. In principle, children could reply to a question like "I know that Grandma gave a candy to the girl, but what else did she do?" with a "1 for All" answer such as "She also gave desserts to the other children". However logically possible (and also pragmatically relevant), that was rarely the case. The use of a ditransitive prompt, beyond triggering the expected construction, facilitated the perception of sub-events, a strategy which children were robustly able to adhere to, by using contrastive topicalization tokens.

Finally, it is important to note that the puppet's crucial question did not explicitly require that children included the foci in their answers (e.g. "I need to know what happened with the animals. So please tell me: *what did Bob do*?"). Rather, the puppet's line mentioned the potential topics and asked for a predication (more precisely, a comment) about the *agent*. Linking a focus to a topic is a core characteristic of contrastive topicalization (recall from the Introduction that contrastive topicalization is a strategy that links an alternative from a set of topics to an alternative from a set of foci). That

children were able to add foci, by linking each topic to its corresponding focus, is evidence of their knowledge of contrastive topicalization.

Before ending this sub-section, I would like to address one issue that was not predicted by the experimental design and rule it out as a possible confound. In order to prompt the verb *give* in the experiment without using a ditransitive construction, the mono-transitive expression *give away* was used. Naïvely chosen, this expression did not go unnoticed by children. While only 8 (out 120) answers by adults included the word *away* (disregarding how many times it was used within a single answer), a much larger number of children used it in their answers. It is conceivable that the use of the word *away* in the stories may have increased the choice for prepositional dative constructions, given that double object constructions are ruled out if *away* is used (cf. (18) below). It was shown above that the double object construction was pragmatically disfavored in the conditions presented to subjects in Group 1, although in principle it was not completely impossible. That children in Group 1 did not provide any recipient-first answers (rather than providing some) may in part follow from the use of *away*, although not significantly: 31 out of 60 answers (12 test items x 5 children) did not include any instance of *away*, and could in principle employ double object constructions, which was not the case.[21]

(18) a. John gave away a book to Mary.
b. *John gave away Mary a book.

Moreover, even though the use of *away* may have conspired against the use of double object constructions by children in Group 2, crucially double object constructions significantly outnumbered prepositional datives.[22] *Away* was mentioned the same amount of times in the stories presented to

[21] It is also important to note that the use of *give away*, while precluding the use of the double object construction, does not entail the use of the prepositional dative construction, as it is also possible with mono-transitive structures, as in (i), which were coded as "Other" in this experiment. That was in fact the case of many of the uses of *away* by children in both groups.
(i) John gave a book away.

[22] If anything, removing the word *away* from the stories would likely *increase* the number of double object constructions in Group 2.

both groups, in exactly the same places, and yet, while 29 out of 60 answers in Group 1 included an instance of *away*, that was the case of only 17 out of 60 answers in Group 2 (a two-tailed Fisher's exact test revealed $p<0.05$). That is, answers with *away* appeared significantly more often where themes, rather than recipients, were topics (and therefore more likely to not be dropped and to appear first, the exact contexts where *away* can be used with the verb *give*). The topicality of recipients, and consequent preference for double object constructions, significantly constrained the use of *away*. I therefore maintain that the appearance of the expression *give away* in the stories had little effect (if any) in children's choice of a dative construction. The factors of Information Structure, as discussed above, prevailed.

4.2. On the design of the experiment and the harmonic alignment

Recall from the discussion in Section 2 that discourse givenness is often aligned with other formal properties, especially in that discourse-given elements tend be pronominalized. In the current experiment, it was expected that the nature of the contrastive scenarios would minimize the use of pronominalization by children. This expectation was robustly confirmed. Out 120 possible answers (12 stories x 10 subjects), 68 employed contrastive topicalization (by providing at least one token thereof). Out of these 68 answers, only one included a pronoun. This pronoun appeared in the last theme-recipient pairing, clearly because the child did not remember the character's name, Pocahontas (note that the child referred to both of the first two princesses as "Cinderella"). Interestingly, the pronoun appeared where a double object construction was expected.[23]

[23] A much larger rate of pronominalization appeared in "1 for All" answers. For instance, the pronoun "them", as in (i) below, appeared in 16 answers. This corroborates the claim that contrast minimized the use of pronominalization — when a contrastive strategy was not employed by children, pronouns were significantly more frequent.
(i) He gave the gifts to them. (A1G1, 4;09)

(19) *He gave Cinderella a... iPad, and Santa gave Cinderella a doll, and he gave hmm... he gave her a guitar.*
(D1G2, 5;02)

While confirming Stephens's (2015) results that children between the ages of 4 and 5 are sensitive to informational factors, the present study provides evidence for the independent role of givenness and topicality (which was found in adult language by Bresnan et al. 2007), given that pronominalization was factored out of the harmonic alignment. Recall that in Stephens's experiment an overall 80% of given themes and recipients were realized as pronouns (with 100% of pronominal themes appearing first and 80% of given pronominal recipients appearing first). Crucially, contrast was not part of that experiment, where each condition included only one agent, one theme, and one recipient/goal. Interestingly, however, like in her experiment, my experiment found a categorical effect of the themes' givenness in the choice of the prepositional dative construction, while the recipients' givenness had a smaller effect in the choice of the double object construction.

The (virtual) absence of pronominalization in the contrastive topicalization answers of my experiment raises an interesting question about De Cat's (2009) study on early topicalization in French. In her experiment, contrastive topicalization was also expected to minimize the use of pronouns (more specifically, she expected sentential subjects in the topic condition to be realized by more than just a subject clitic, as there were three different characters performing three different actions). Interestingly, however, children before the age of 4;06 used full noun phrases to refer to the subjects in only about 45% of the cases, while children between the ages of 4;06 and 5;06 used full noun phrases in 84% of the cases. The question is why.

For De Cat, children's underuse of full noun phrases (to disambiguate between the three agents of the topic conditions) is due to their reliance on joint attention with their interlocutor. Given that the experimenter too could see the pictures and have access to the relevant information, she

argues, children exploited the joint attention with their addressee and relied more on the situational context than on the linguistic discourse, reducing the amount of information expressed linguistically, often by pronominalization (and/or pointing). In my experiment, rather than interacting with the story teller, children were prompted by a puppet who had missed the story, to whom only some elements of the plot were revealed by the experimenter. Although that tactic certainly minimized the joint attention and shared knowledge between the child and the one asking the relevant prompt questions, that cannot have been the whole story of why pronouns were (almost) categorically avoided in the answers with contrastive topicalization — especially because the potential contrastive topics were revealed to the puppet (mentioned only once, though). In order to explain that result, two other properties of the design of my experiment must be taken into account.

First, De Cat's experiment collapsed two topical properties in one element. The sentential subjects in her topic conditions had at the same time *aboutness* status (viz. the prompt question, "What are they doing now?") and potential for *contrastive* status (as there were multiple agents in a given story). That conflation likely reduced the role of contrast and the aboutness of the subjects led to pronominalization. In my experiment, conversely, aboutness and contrast were teased apart. While aboutness explicitly fell upon the agents (e.g. "This is a story about Bob the Farmer"), about which a question was asked in the relevant prompt (e.g. "What did Bob the farmer do?"), the contrastive topic potential fell upon internal arguments of the ditransitive predicate (either themes or recipients). Crucially, the sentential subjects both in her experiment and in mine had a much higher rate of pronominalization than the contrastive topics of my experiment. This fact can be taken as more reliable evidence for the role of contrast in the speech of 4.5-year old children.

Second, in her experiment the focus associated with a topic/subject fell upon the whole verbal predicate (the subject's action), whereas in my experiment the associated focus again fell upon an internal argument of the verb (a constituent smaller than a verbal predicate). In that respect, a

reasonable assumption is that the narrower the focus, the more likely it is to be marked (compare for instance the syntax and the prosody of a broad-focus, all-new sentence and the marked strategies of narrow focalization). That being so, having a narrower focus in my experiment facilitated the observation of how a focus is linked to a topic, creating the effect of contrastive topicalization. Recall that the elements given focus potential were not asked about — or even mentioned — in the puppet's questions. As discussed in the previous sub-section, that children were able to add foci on their own and link them to the corresponding topics (which by virtue of being contrastive were not pronominalized) is a strong indication of their knowledge of contrastive topicalization.

4.3. A "gap" in children's production

Although the results provide strong support for the hypothesis that 4.5-year-olds can distinguish topics from foci and are competent with contrastive topicalization, one important question that needs to be addressed is why they employed contrastive strategies in only about half of the cases (52.3%; see Figure 2).

In order to address that question, I would like to present one unexpected but very interesting result of the experiment. In the kind of contrastive topicalization used here, all possible alternatives of themes and recipients in a given story were known by the subjects and expected to be used in their answers, while the agent and the verb remained constant within a story. This combination created a perfect scenario for *gapping* constructions.[24] But for adults only.

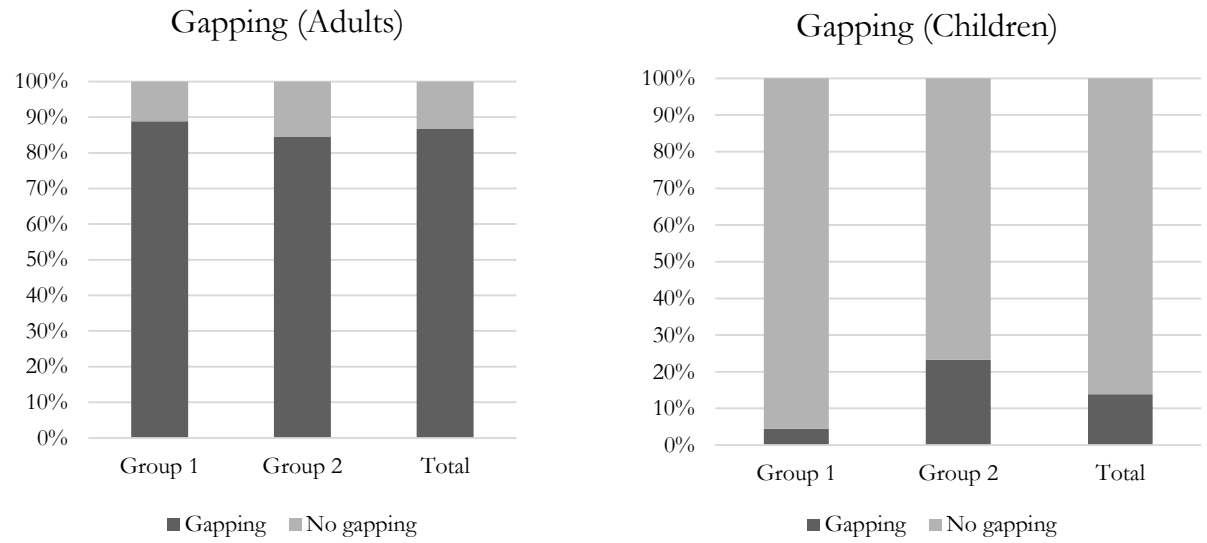
[24] For an analysis of contrastive ellipsis, see Konietzko & Winkler (2010). While the authors clearly analyze gapping in German as being an instance of contrastive topicalization ("CT-ellipsis"), they seem ambivalent with respect to English, mostly based on English constructions that do not parallel German. However, they analyze the example in (i) below as involving an implicit multiple *wh*-question (*Who plays what?*), and explicitly state that "[t]he contrasts are realized on the topics and the foci" (p.1438). I take this to be a clear instance of contrastive topicalization, as well as (20)a in the text.

(i) Sandy plays SOCCER and ANNA TENNIS. Konietzko & Winkler (2010:1437)

The use of gapping was possible in 18 tokens (theme-recipient pairings) of contrastive topicalization per subject.[25] However, while answers like (20)a were pervasive in the adult data (86.7% of 180), children used gapping in only 13.9% of the potential 180 cases (see Figure 9 below). Even children who provided complete and detailed answers often resorted to strategies like (20)b.

(20) a. *Becky gave the lion a soccer ball, the zebra a basketball, and the elephant a football.*
(S2P2, adult)

b. *Becky gave the lion a soccer ball, and Becky gave the zebra a basketball, and Becky gave the elephant a football.* (D1G2, 5;02)



Gapping	Adults Group 1	Adults Group 2	**Total**	Children Group 1	Children Group 2	**Total**
Gapping	(88.9%) 80	76 (84.4%)	**156 (86.7%)**	4 (4.4%)	21 (23.3%)	**25 (13.9%)**
No gapping	(11.1%) 10	14 (15.6%)	**24 (13.3%)**	86 (95.6%)	69 (76.7%)	**155 (86.1%)**

Fig. 9: Gapping

If for some reason gapping is not a construction that is fully mastered by English-acquiring 4.5-year-olds, one could hypothesize that its (near-)absence contributed to children's non-adult-like

[25] All tokens but the first in a sentence allowed for gapping. The stories without ditransitive prompt allowed for up to 12 gapping instances, while stories with ditransitive prompt allowed for up to 6 gapping instances.

rate of contrastive topicalization. Without gapping at children's disposal, the puppet's question about what the agent of the story did would require of them an answer with up to three full sentences. While some children, like subject D1G2 in (20)b above, were not intimidated by that, some might have chosen a less eloquent, more economical "1 for All" kind of answer in order to avoid producing such long utterances, which would require a larger processing load. This is not a surprising behavior, however. Katsos & Bishop (2011) showed that even though English-acquiring children as old as 5 to 6 years-old are aware of pragmatic informativity, they are still more tolerant of infelicity than adults, in allowing for pragmatically weaker interpretations (which has also been shown by Cremers et al. (to appear) to be the case in the exhaustivity of questions, in their experiment with French-acquiring 5-year-olds). It should also be pointed out that children's answers that fell under the label "1 for All", despite being less informative, were in most cases still pragmatically relevant, in that they did address the question being asked.

Regardless of why children did not have an adult-like rate of contrastive topicalization tokens, the most important question is why children used a contrastive strategy when they did. The fact is that when the conditions enforced the use of contrastive topicalization, the burden of longer utterances did not preclude children from using contrastive topicalization tokens.

Why gapping is nearly absent in children's responses (even though the situation was highly favorable for it) is a matter I could only speculate about at this moment. Although this finding raises interesting questions about the acquisition of complex ellipsis constructions and their relation to Information Structure in early language, I will leave the matter for future research.

5. FINAL REMARKS

The results of the experiment conducted in this study, as well as the discussion thereof, indicate that English-acquiring children, at least by the age of four and a half years old, are sensitive to discourse givenness, topicality, and contrast. Particularly, the role of Information Structure independently of pronominalization is highlighted, for contrast (and of course children's sensitivity to it) gave rise to a (virtually) categorical preference for full noun phrases where contrastive topicalization strategies were employed, to express topics and foci alike. It was shown that even with two full noun phrases expressing the internal arguments of the verb *give*, the given-before-new (i.e. topic-before-focus) preference was robust.

That this discursive distinction was reflected in scenarios of contrastive topicalization indicates that children at that age are sensitive to contrast also in given information (in addition to contrast in new information, as shown by e.g. Gökgöz et al. 2016). Despite showing some non-adult-like exhaustivity and informativity reluctance in the weaker pragmatic conditions, children did subdivide the relevant *giving* event into sub-events when the context became more favorable for that. In other words, the question made by the puppet ("What did [the agent] do?"), i.e. the question under discussion, was broken down into sub-questions, for each of which a dative construction provided an answer.[26]

On a somewhat speculative note, I would like to suggest that breaking down a question into sub-questions may be the decisive ability that children must master in order to be able to produce

[26] Putatively, the sub-questions were:
(i) What recipient did [the agent] give theme 1 to?
What recipient did [the agent] give theme 2 to?
What recipient did [the agent] give theme 3 to?
(ii) What theme did [the agent] give recipient 1?
What theme did [the agent] give recipient 2?
What theme did [the agent] give recipient 3?

contrastive topicalization — evidently, children must also be able to decide in which contexts they should apply that strategy. The crucial ingredients of contrastive topicalization — the given-new distinction, the sensitivity to contrast and alternatives, and the syntactic domain where the strategy can be used, such as the dative alternation — are mastered early, as has been demonstrated by the several works cited here. Therefore, assuming that one's pragmatic moves make use of the structures independently available in one's grammar, what children need in order to produce contrastive topicalization in an adult-like way is to be able to link the conversational necessity of breaking down a question into sub-questions to an available syntactic structure that meets that necessity. When that general ability is acquired and what makes it possible (in terms of innate knowledge and acquired knowledge) are open questions. In that sense, the current work envisions a bridge between contrastive topicalization and other phenomena that involve sub-question strategies in the face of alternatives, such as pair-list configurations and multiple *wh*-questions.

The results of the experiment reported in this paper thereby provide support for a body of work evidencing early pragmatic competence in language acquisition, to which competence on contrastive topicalization (in English, at least) must be added.

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APPENDIX

A. Plot samples

(1) **Training story: *Misty in the forest***
(Themes Given)

Aboutness:	This is a story about Misty.
Scenario:	Misty is going for a walk in the forest. She loves the outdoors!
Topic:	When she's hiking, she likes to pick up things from the ground.
	She picked up **a flower**, but she doesn't want it anymore.
Give:	She is not taking it home, so she wants to **give** it away.
Focus:	Oh, Misty is grabbing **the flower**! Look at that, that's ***Perry***!
End:	Misty loves to go hiking! There are lots of beautiful things in the forest!

Sleepy puppet was sleeping and missed the story. He wakes up at the end of the story.

PUPPET:	Hey, what's up?
EXP:	Hi, Jay-Jay! You missed a story.
PUPPET:	Oh, really? I wanna know what that story was about!
EXP:	This was a story about Misty. She went for a walk in the forest, and she picked up **a flower** that she wanted to **give** away. Then her friend showed up.
PUPPET:	What a fun story! Hey, CHILD [*name*], you saw the story! I wanna know what happened with **the flower**. So please tell me: *what did Misty do*?
CHILD:	_____
PUPPET:	That was a fun story! Thanks for telling it to me, CHILD [*name*]! Awwwnnn! I am so sleepy! I should go back to bed now! Bye!

(2) **Test item: *Becky has a circus***

(Themes Given, Optional Contrast, No Ditransitive Prompt)

Aboutness:	This is a story about Becky.
Scenario:	Becky is a sports teacher. Today she is teaching in the circus!
Topics:	She brought several balls with her:
	a soccer ball, **a basketball**, and **a football**.
Give:	Becky will teach the animals of the circus.
	So she wants to **give** these balls away.
Focus 1:	Look! Becky is grabbing **the soccer ball**! Oh, here comes ***a lion***!
Focus 2:	And now Becky is grabbing **the basketball**! Look, that's ***a zebra***!
Focus 3:	Finally, Becky is grabbing **the football**! And here comes ***an elephant***!
End:	That's how Becky takes care of her circus! She has a lot of fun there!

Sleepy puppet was sleeping and missed the story. He wakes up at the end of the story.

PUPPET:	Hey, what's up?
EXP:	Hi, Bobby! You missed a story.
PUPPET:	Oh, really? I wanna know what that story was about!
EXP:	This was a story about Becky. She teaches sports in the circus and she had a few balls to **give** away: **a soccer ball**, **a basketball**, and **a football**. Then the animals showed up in the circus.
PUPPET:	That is so cool! Hey, CHILD [*name*], you saw the story! I wanna know what happened with **the balls**. So please tell me: *what did Becky do*?
CHILD:	_____
(PUPPET:	Interesting! And what else? Tell me more!) *extra*
CHILD:	_____
PUPPET:	Fantastic! Oh, boy! I think the sleep bug bit me today. I'm gonna hit the hay!

(3) **Test item: *Bob the Farmer***

(Recipients Given, Enforced Contrast, No Ditransitive Prompt)

Aboutness:	This is a story about Bob the farmer.
Scenario:	Bob has a big and beautiful farm. He takes care of it very well!
Topics:	He has several animals in his farm:
	a dog, **a cat**, and **a monkey**.
Give:	Bob the farmer has to make sure he feeds the animals in the right way!
	He has different kinds of animal foods to **give** away.
Focus 1:	Look! Bob is going to **the dog**. "You can have ***bones***!"
Focus 2:	Hmm, now Bob is going to **the cat**! "I have ***fish*** for you!"
Focus 3:	And now Bob is going to **the monkey**! "And here's ***bananas***!"
End:	That's how Bob takes care of his farm! He is a very good farmer!

Engaged puppet was in class and missed the story. He comes by at the end of the story.

PUPPET:	Hello! What's going on?
EXP:	Hi, Kiko! You missed a story.
PUPPET:	Oh, really? Tell me everything!
EXP:	This was a story about Bob the farmer. He had a farm, and he had several animals: **a dog**, **a cat**, and **a monkey**. And he had different animal foods to **give** away.
PUPPET:	That is so nice! I wanna have a farm too! I need to know how to do things around the farm in the right way! Hey, CHILD [*name*], you know the right way to run a farm! I need to know what happened with **the animals**. So please tell me: *what did Bob do*?
CHILD:	_____
(PUPPET:	Awesome! And what else? Tell me more!) *extra*
CHILD:	_____
PUPPET:	That was a cool story! Well, I have another class now. See you soon!

(4) **Test item: *Grandma's house***

(Recipients Given, Optional Contrast, With Ditransitive Prompt)

Aboutness:	This is a story about Grandma.
Scenario:	Grandma is a very nice old lady! She loves having people over!
Topics:	She has lots of kids at home today:
	a girl, **a boy**, and **a baby**.
Give:	She wants to surprise them!
	So she has a few deserts to **give** away.
Focus 1:	Oh, Grandma is going to **the girl**. "I have ***a candy*** for you!"
Focus 2:	Now Grandma is going to **the boy**! "You'll love ***an ice-cream***!"
Focus 3:	Finally, Grandma is going to **the baby**! "And here's ***a cookie***!"
End:	Oh boy! At Grandma's house, everything is so yummy!

Sleepy puppet was sleeping and missed the story. He wakes up at the end of the story.

PUPPET:	Hey, what's up?
EXP:	Hi, Jay-Jay! You missed a story.
PUPPET:	Oh, really? I wanna know what that story was about!
EXP:	This was a story about Grandma. She was at home, and she had lots of kids over: **a girl**, **a boy**, and **a baby**. And she had some desserts to **give** away. SHE GAVE **THE GIRL *A CANDY***…
PUPPET:	[*Puppet interrupts*] Another yummy story! Hey, CHILD [*name*], you saw the story! I wanna know what happened with **the kids**. I know that GRANDMA GAVE **THE GIRL *A CANDY***, but please tell me: *what else did she do*?
CHILD:	_____
(PUPPET:	Sounds delicious! What else? Tell me more!) *extra*
CHILD:	_____
PUPPET:	I love stories with food! I love eating, but I also love sleeping. I am going back to bed!

(5) **Test item: *Supergirl and the mission in the sky***

(Themes Given, Enforced Contrast, With Ditransitive Prompt)

Aboutness: This is a story about Super Girl.

Scenario: Super Girl has a mission in the sky. She has to save the universe!

Topics: For this mission, she has a number of aircrafts:
a spaceship, **a rocket**, and **an airplane**.

Give: Super Girl has to make sure her heroes accomplish their missions.
So she has to **give** these aircrafts away in the right way.

Focus 1: Hey, Super Girl is grabbing **the spaceship**! Look, that's ***an alien***!

Focus 2: Now Super Girl is grabbing **the rocket**! Hey, that's ***an astronaut***!

Focus 3: Finally, Super Girl is grabbing **the airplane**! And here comes ***a pilot***!

End: Woo-hoo! Super Girl saves the universe!

Engaged puppet was in class and missed the story. He comes by at the end of the story.

PUPPET: Hello! What's going on?

EXP: Hi, Mimo! You missed a story.

PUPPET: Oh, really? I wanna know what that story was about!

EXP: This was a story about Super Girl. She had a mission in the sky, and she had a number of aircrafts to **give** away: **a spaceship**, **a rocket**, and **an airplane**. Then the heroes showed up to the mission. SHE GAVE **THE SPACESHIP** TO ***THE ALIEN***…

PUPPET: [*Puppet interrupts*] That's an amazing story! I wanna save the universe too! I need to know how to do a mission in the right way! Hey, CHILD [*name*], you know the right way to accomplish a mission in the sky! I need to know what happened with **the aircrafts**. I know that SUPER GIRL GAVE **THE SPACESHIP** TO ***THE ALIEN***, but please tell me: *what else did she do*?

CHILD: _____

(PUPPET: Awesome! What else? Tell me more!) *extra*

CHILD: _____

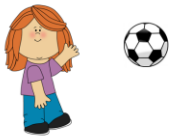
PUPPET: I love superhero stories! I can't wait to tell this story to the other kids in my school. I had lots of fun hearing your stories, CHILD [*name*]! Bye bye!

B. Slide animation samples

(1) Test item: *Becky has a circus* (Themes given)

1

2



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(2) **Test item: *Grandma's house* (Recipients given)**

1

Grandma's house

2

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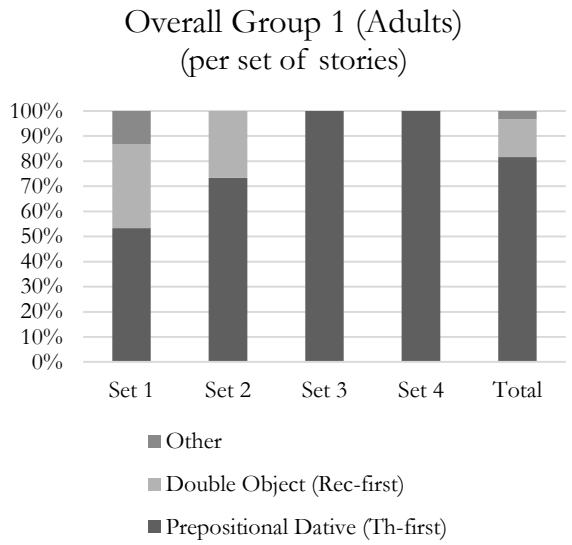
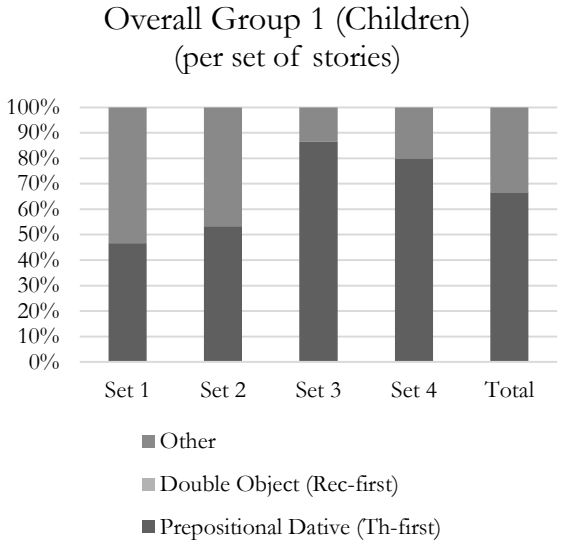
C. Coding chart sample

Subject: E1G2 (Group 2)					
No Prompt	**Token 1**	**Token 2**	**Token 3**	**Token Majority**	**1 for All**
Opt. Contrast. A	TH	TH	TH	TH	Other
Opt. Contrast. B	Other	Other	Other	Other	Other
Opt. Contrast. C	Other	Other	Other	Other	Other
Enf. Contrast. A	REC	REC	REC	REC	Other
Enf. Contrast. B	TH	TH	TH	TH	Other
Enf. Contrast. C	TH	TH	TH	TH	Other
With Prompt	**Token 1**	**Token 2**	**Token 3**	**Token Majority**	**1 for All**
Opt. Contrast. A	N/A	REC	REC	REC	Other
Opt. Contrast. B	N/A	REC	REC	REC	Other
Opt. Contrast. C	N/A	REC	REC	REC	Other
Enf. Contrast. A	N/A	REC	REC	REC	Other
Enf. Contrast. B	N/A	REC	REC	REC	Other
Enf. Contrast. C	N/A	REC	REC	REC	Other

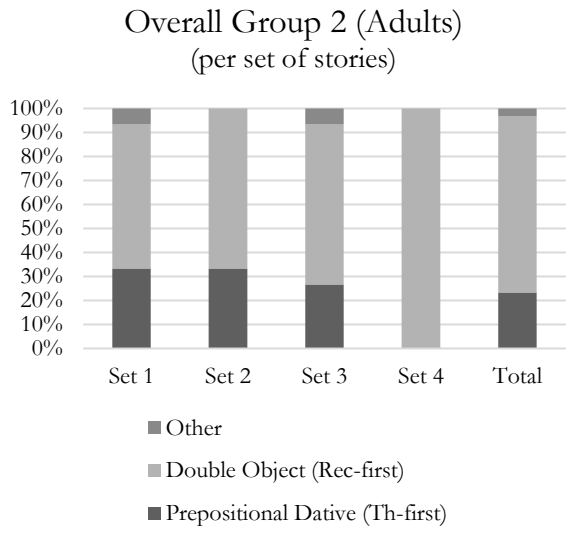
D. Overall results (per set of stories)

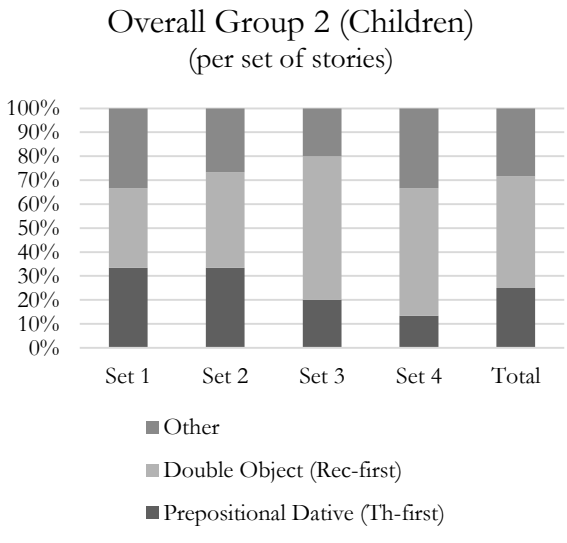




Overall (per set)	Adults Group 1					Children Group 1				
	Set1	Set2	Set 3	Set 4	**Total**	Set 1	Set 2	Set 3	Set 4	**Total**
Prep. Dative (Th-first)	8 (53.3%)	11 (73.3%)	15 (100%)	15 (100%)	**49 (81.7%)**	7 (46.7%)	8 (53.3%)	13 (86.7%)	12 (80%)	**40 (66.7%)**
Doub. Object (Rec-first)	5 (33.3%)	4 (26.7%)	0 (0%)	0 (0%)	**9 (15%)**	0 (0%)	0 (0%)	0 (0%)	0 (0%)	**0 (0%)**
Other	2 (13.3%)	0 (0%)	0 (0%)	0 (0%)	**2 (3.3%)**	8 (53.3%)	7 (46.7%)	2 (13.3%)	3 (20%)	**20 (33.3%)**

Fig. 1: Overall results per set of stories (Group 1)





Overall (per set)	Adults Group 2					Children Group 2				
	Set1	Set2	Set 3	Set 4	**Total**	Set 1	Set 2	Set 3	Set 4	**Total**
Prep. Dative (Th-first)	5 (33.3%)	5 (33.3%)	4 (26.7%)	0 (0%)	**14 (23.3%)**	5 (33.3%)	5 (33.3%)	3 (20%)	2 (13.3%)	**15 (25%)**
Doub. Object (Rec-first)	9 (60%)	10 (66.7%)	10 (66.7%)	15 (100%)	**44 (73.3%)**	5 (33.3%)	6 (40%)	9 (60%)	8 (53.3%)	**28 (46.7%)**
Other	1 (6.7%)	0 (0%)	1 (6.7%)	0 (0%)	**2 (3.3%)**	5 (33.3%)	4 (26.7%)	3 (20%)	5 (33.3%)	**17 (28.3%)**

Fig. 2: Overall results per set of stories (Group 2)