

Syntax First: Re-Examination of Clefts in Child Japanese

Wataru Sugiura and Kamil Deen

1. Introduction

A so-called subject advantage is widely observed in children's comprehension of A'-dependencies (e.g., Friedmann et al., 2009). This is observed in a number of constructions (e.g., relative clauses, clefts, etc.) and a number of languages, and is widely seen across populations (see Lau and Tanaka, 2021 for a review). One apparent exception to this widely-observed generalization comes from Ohba, T. Sano and Yamakoshi (2019, hereafter OSY), who reported an object advantage for Japanese clefts. They attribute children's errors to an Agent-first heuristic, where children's propensity to assign the agent role to the first nominal in a sentence leads to an object advantage. In this paper we re-examine this claim. Using two experiments that modify the task and visual stimuli, we test whether the reported object advantage reflects children's true grammatical knowledge or whether it emerges from a complicated experimental design. We find robust accuracy for subject clefts, and we observe substantially improved performance on object clefts once several pictorial confounds in OSY's experiment are removed.

We propose the Syntax First Hypothesis in children's sentence comprehension, according to which children are endowed with full knowledge of syntax (aka Full Continuity, as in Pinker, 1984) and are then able to deploy that knowledge fully, provided the experimental setting is conducive. When the visual scene or linguistic stimuli in an experiment introduce role ambiguity or competing cues, or when trial structure encourages carryover strategies, children may appear to rely on non-syntactic shortcuts such as Agent-first bias. Crucially, this does not imply that syntactic representations are absent; rather, heuristic-like responses can be a byproduct of methodological factors. More generally, our findings suggest that the "object advantage" reported in OSY for Japanese clefts is just a pattern that can be attributed to their experimental design.

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2. Background

Many studies have found that both children and adults understand subject relative clauses better and produce them more easily than object relative clauses (English: Bever, 1970; Diessel and Tomasello, 2005; Lau and Tanaka, 2021, Italian: Guasti et al., 2012, Hebrew: Friedmann et al., 2009, French: Durrleman et al., 2016, a.o.). Moreover, children often misinterpret sentences like (1b) as (1a), and when prompted to produce sentences like (1b), they do so with sentences like (1a), or a passivized subject relative clause (see, for example, Hsu et al., 2009; Tanaka, 2016).

- (1) a. the dog [that __ chased the cat]
- b. the cat [that the dog chased __]

A similar asymmetry has also been reported for cleft sentences.

- (2) a. It is the dog [that __ chased the cat].
- b. It is the cat [that the dog chased __].

Before discussing the developmental asymmetry, let us briefly look at the structure and function of clefts, since they are at the core of the current research. A cleft sentence is a type of focus construction that can be divided into two components: the focused NP and the presuppositional clause (e.g., Prince, 1978). The focused NP carries the newest or most salient information, while the presuppositional clause represents information that is already established or assumed in the discourse context. For instance, in the sentence in (2a), the phrase *the dog* serves as the focused nominal, and the clause *that chased the cat* conveys the presupposition that some entity chased the cat.

Due to this information structure, cleft sentences are inherently context-dependent. Their use is typically considered felicitous only when the presupposition is supported by the preceding discourse (e.g., Rochemont, 1986; Delin, 1992). For example, a context like “Look! Someone is chasing the cat.” satisfies the presupposition, making the use of (2a) natural and felicitous. Without such a context, the use of a cleft is likely to be infelicitous.

In terms of comprehension of clefts by children, subject clefts (SC) such as (2a) are generally found to be easier for children to comprehend than object clefts (OC) such as (2b) (English: Bever, 1970; Lempert and Kinsbourne, 1980; Tily et al., 2010; Japanese: K. Sano, 1977; Dansako and Mizumoto, 2007; Portuguese: Lobo et al., 2019). Hence, we see the alleged subject advantage in clefts as well.

Interestingly, OSY found that Japanese-speaking children exhibited higher accuracy in comprehension of object clefts compared to subject clefts. In their experiment, they provided a context picture (Fig 1), so as to make the cleft sentence felicitous (Rochemont, 1986, Delin, 1992, Lambrecht, 2001, a.o.; for an acquisition study, see Aravind et al., 2018).

- (3) Mite! Dareka-ga zou-o arat-tei-te,
 Look someone-NOM elephant-ACC wash-PROG-and
 zou-ga dareka-o arat-tei-ru-yo.
 elephant-NOM someone-ACC wash-PROG-PRES-SFP
 ‘Look! Someone is washing the elephant, and the elephant is washing someone.’

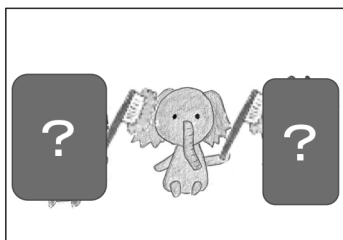


Figure 1. Context picture in OSY

Children then heard either an SC or OC with the target picture (Fig 2). Note that Japanese clefts begin with the so-called presuppositional clause followed by the focus phrase (see Hoji, 1987; Hiraiwa and Ishihara, 2012 for syntactic derivation of Japanese clefts).¹

- (4) a. [__ Zou-o arat-tei-ru no]-wa inu da-yo. (SC)
 elephant-ACC wash-PROG-PRES C-TOP dog COP-SFP
 ‘It is a dog that __ is washing the elephant.’
 b. [Zou-ga __ arat-tei-ru no]-wa usi da-yo. (OC)
 elephant-NOM wash-PROG-PRES C-TOP cow COP-SFP
 ‘It is a cow that the elephant is washing __.’

¹ Previous syntax studies have claimed that Japanese possesses two distinct types of cleft constructions (Hoji, 1987; Hiraiwa and Ishihara, 2012). According to their analysis, the classification depends on the morphological marking of the focused NP: if the focused NP bears a case marker, the sentence is classified as a cleft; however, if the focused NP is bare, the sentence is categorized as a pseudo-cleft.

- (i) [Taro-ga _ tabe-ta no]-wa kono-ringo-o/-ø (3-tu) da.
 Taro-NOM eat-PAST C-TOP this-apple-ACC/-ø 3-CL COP
 ‘It is (three of) these apples that Taro ate.’

(Hiraiwa and Ishihara, 2012)

The crucial point of their claim is that Japanese clefts involve syntactic movement, while pseudo-clefts do not. If this analysis is correct, then both the sentences used in OSY and those in our own experiments should be classified as pseudo-clefts, given the bare nature of the focused NPs.

on the middle character, who in turn is performing that same action on the third character.

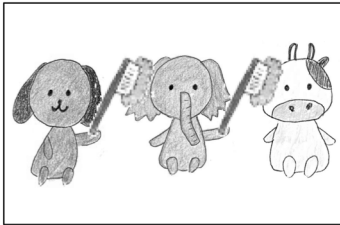


Figure 3. Target picture in OSY

This is a clever picture because it allows the depiction of an agent and a theme of the very same action all in the same picture. However, this introduces some complexities which we believe are disadvantageous for the testing of young children. First, the leftmost character in Fig 3 may be interpreted as an (indirect) agent of the washing of the cow. Even though the elephant is (directly) washing the cow, children might infer that the dog is also indirectly washing the cow, as part of a sequential event. Second, the middle character has theta-role ambiguity. This elephant is being washed by the dog in this picture, and at the same time, this elephant is also washing the cow. And finally, the event may be perceived cumulatively: the rightmost character may be seen as the most affected character of the three animals, since the washing seems to originate on the left and accumulate as you move rightwards. Our point is that there is a lot of visual and cognitive decoding required in order to make sense of this picture, and we are not convinced that young children are able to do that on the fly while being tested.

In sum, while this picture is a clever one from an experimental point of view, it is rather challenging from children's point of view, and we think that this type of picture may be confusing for them.

Moreover, we note that OSY's experiment used a within-subject design and included eight SOV practice items. Since their practice items were all agent-first, and the OCs were mixed in with SCs, there was an imbalance of agent-first NPs versus theme-first NPs in the overall experimental list, perhaps accentuating the reliance on the Agent-first bias. In what follows, we address these methodological concerns in our own experiment, along with a replication experiment of OSY's study.

4. Experiments

To examine Japanese-speaking children's knowledge of clefts more precisely, we conducted the following two experiments. In both experiments, we used a character-selection task, where children were asked a question using a cleft sentence. The head noun of the cleft, therefore was always the *wh*-question word, *dare* 'who'. We also used a between-subject design where children in each

condition heard blocks of SCs and blocks of OCs (not intermingled, as in OSY), counterbalanced. We also manipulated the picture design, as described below.

Forty-four monolingual Japanese children from 4;0 to 5;6 participated in this study, and were divided into two experiments, each consisting of two groups. Within each group, children received a block of three SC trials and a block of three OC trials, with the order of presentation counterbalanced between the groups.

4.1. Experiment 1: Partial Replication of OSY

In this experiment, we used OSY-style picture stimuli, with three animals in each picture as shown below.

- (7) a. Context
- | | | | |
|-------------|-------------|----------------|-----|
| Dareka-ga | inu-o | arat-tei | te, |
| someone-NOM | dog-ACC | wash-PROG | and |
| inu-ga | dareka-o | arat-tei-ru | yo. |
| dog-NOM | someone-ACC | wash-PROG-PRES | SFP |
- ‘Someone is washing the dog, and the dog is washing someone.’
- b. SC
- | | | | | | |
|------------|----------------|--------|------|----|-----|
| [__ Inu-o | arat-tei-ru | no]-wa | dare | ka | na? |
| dog-ACC | wash-PROG-PRES | C-TOP | who | Q | SFP |
- ‘Who is it that __ is washing the dog?’
- c. OC
- | | | | | | |
|------------|----------------|--------|------|----|-----|
| [Inu-ga __ | arat-tei-ru | no]-wa | dare | ka | na? |
| dog-NOM | wash-PROG-PRES | C-TOP | who | Q | SFP |
- ‘Who is it that the dog is washing __?’

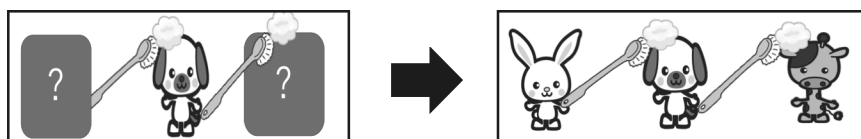


Figure 4. A sample of a context picture (left) and a target picture (right)

Twenty children participated in this experiment, and we assigned them to one of two groups: a group that received three SC trials followed by three OC trials (Group 1, $n = 12$, 4;1–5;4, mean = 4;9) and a group that received the reverse order (Group 2, $n = 8$, 4;0–5;6, mean = 4;10). The results of this experiment are shown in Figure 5.

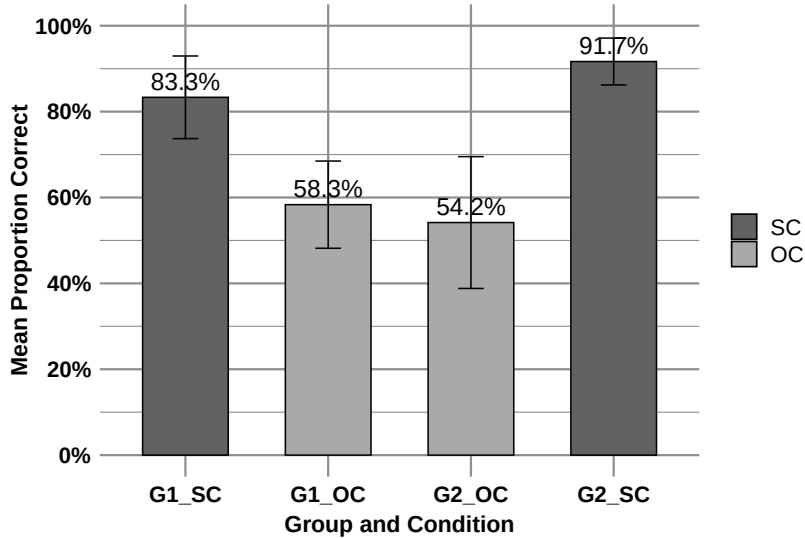


Figure 5. Results of Experiment 1

A Generalized Linear Mixed Model found a significant main effect of condition for both groups (G1 (OC vs. SC): $\beta = 1.28$, OR = 3.6, 95% CI: [1.19, 10.7], $p < .05$, G2 (OC vs. SC): $\beta = 2.36$, OR = 10.6, 95% CI: [2.58, 43.6], $p < .01$). In short, we found high accuracy for subject clefts and low accuracy for object clefts regardless of order. Thus, we observed a subject advantage in clefts of child Japanese with our protocol, contrary to OSY’s results. There are at least two possible explanations why this subject advantage emerges in our experiment versus OSY’s. It may be due to the between-subject design (recall, OSY used a within-subjects design), or due to the character-selection task (recall, OSY used a traditional TVJT with declarative test sentence). At this point, we admit both possibilities.

4.2. Experiment 2: Revised Methodology

In our second experiment, we continued to use the block design and the character-selection task, but we employed a different picture from the OSY style picture. Inspired by Hsu et al. (2009) and Tanaka (2016), we used a split picture design as in Figure 6.

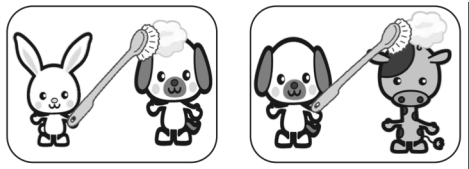


Figure 6. Split picture design in Exp. 2

In this style of experimental stimulus, some of the design flaws pointed out earlier are ameliorated or eliminated: there is no indirect agent, there is no theta-role ambiguity, and there is no character that is cumulatively the most affected.

Twenty-four Japanese-speaking monolingual children participated in this experiment. As in the previous experiment, we divided them into two groups based on the block design. Group 3 received three SC trials followed by three OC trials ($n = 12$, 4;3–5;4, mean = 4;9) and Group 4 received the reverse order ($n = 12$, 4;3–5;4, mean = 4;9). All procedures were the same as Experiment 1, except for the design of pictures. The results of Experiment 2 are shown in Figure 7.

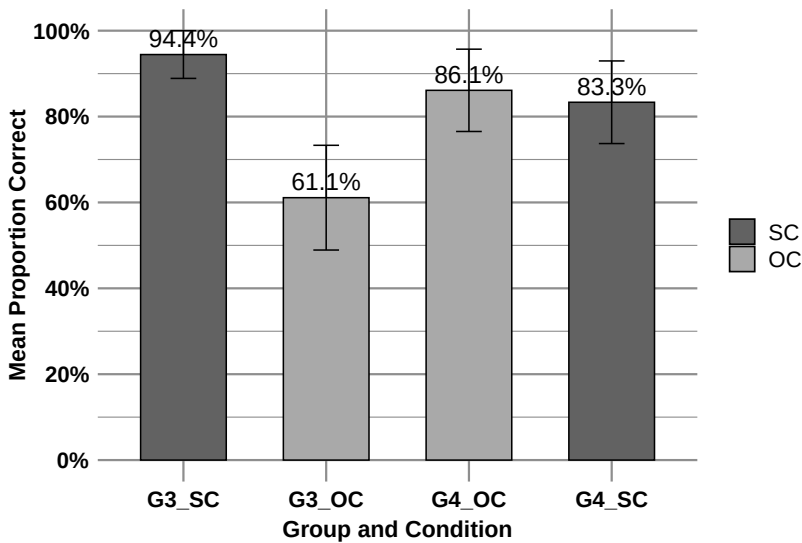


Figure 7. Results of Experiment 2

The accuracy for subject clefts was high, regardless of order of presentation. This suggests that children can comprehend SCs easily, contrary to OSY's results. Also, we found an asymmetry in OCs—Group 3 accuracy was around 60%, while Group 4 accuracy was above 80%. According to our statistical analysis, there was a main effect of condition (SC and OC) in Group 3 ($\beta = 4.183$, OR = 65.5, 95% CI: [8.0, 532.5], $p < .01$), but not in Group 4 (OR = 1.3, 95% CI: [0.18, 3.21], $p = .717$).

The only difference between Group 3 and 4 was in presentation order: in Group 3, OCs came after SCs, while in Group 4, OCs came before SCs. We think that what this shows is that in Group 3, SCs appear to be influencing the interpretation of OCs. In other words, this is an example of an experimental carryover effect of SCs onto OCs, where children interpret the SCs correctly, and then when faced with OCs, continue to expect SCs as the experimental items. Thus, accuracy on the OCs in this experiment suffers because children begin to expect SCs. Curiously, in Group 4, there is no carryover effect of OCs onto SCs.

Why would this be? We think this is because of the primacy of SCs and may be a manifestation of the well-known subject advantage. SCs are privileged, and therefore are more likely to induce a carryover effect, while OCs enjoy no such privilege. Without this privilege, upon hearing OCs, children in Group 4 form no expectation that the remainder of test sentences will be OCs. Rather, they encounter SCs after OCs and are perfectly poised to respond to them, regardless of what came before. In sum, this suggests that SCs may be somehow advantaged, in line with the Subject Advantage, as outlined at the beginning of this paper.

Finally, let us compare the results of Group 2 and Group 4, both of which received OCs first.

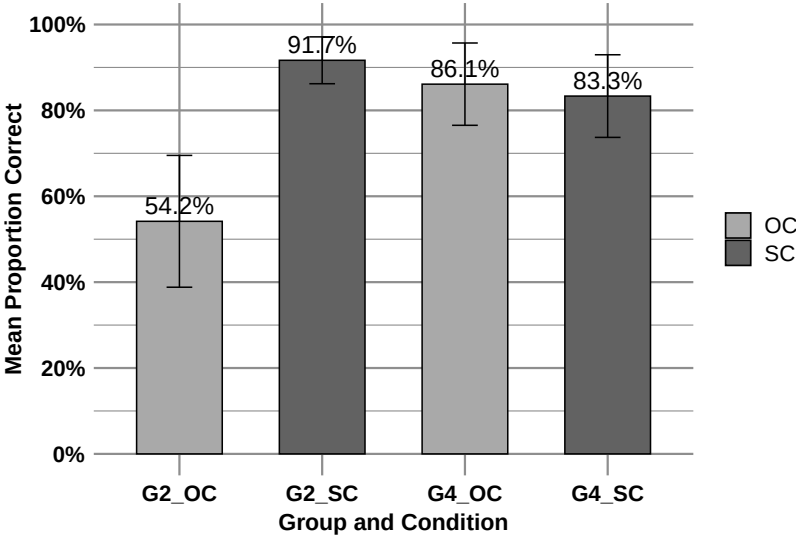


Figure 8. Results of Group 2 and Group 4

The most striking finding of this experiment is the significant improvement in the comprehension of OCs observed in Group 4 (over 86%), while the accuracy of OCs in Group 2 was around 54%. Crucially, the simple main effect analysis revealed that Group 4 achieved significantly higher accuracy on OCs than Group 2 ($p < .05$), while no such group difference was found for SCs ($p = .4$). These results suggest that the split pictures used in our experiment facilitated higher accuracy on OCs in child Japanese.

5. Discussion

Our results indicate that Japanese-speaking children seem to have full knowledge of both types of clefts.² We also suggest that the Agent-first bias may not be a “default” heuristic for children, as is often thought. Children in our study did not seem to rely on this bias. Rather, certain experimental complexities may mask children’s ability to use syntax.

We suggest an approach which we are calling the Syntax First Hypothesis: children’s initial instinct is to use syntax to resolve dependencies, and non-grammatical heuristics (such as the Agent-first bias) arise only when experimental infelicities occur. This hypothesis is reminiscent of Reinhart (1983a, b), who proposed Rule I and argued for two mechanisms potentially involved in anaphora resolution. The reference of a reflexive pronoun or (regular) pronoun could be resolved through syntax (Principle A or B), or through discourse by searching for potential antecedents. Reinhart argued that this second (discourse) mechanism is computationally more demanding, and therefore she invoked Rule I—a pragmatic principle stipulating that the syntactic mechanism should always be prioritized.

Chien and Wexler (1990) argued that children fail in Principle B experiments because they lack Rule I. This claim was later disputed by Conroy et al. (2009), and we likewise dispute the assertion that children do not possess Rule I. Our argument is that children always use syntax first—that is, Rule I is robust in children—and that any failure to employ syntax is attributable to experimental methodological problems. This explains why, we believe, OSY found an OC advantage in their experiment; certain experimental infelicities may have obscured the children’s inherent syntactic competence.

6. Conclusion

To conclude, OSY reported an object advantage in the comprehension of clefts in child Japanese, which they attributed to the Agent-first bias. We were skeptical of this result for two reasons. First, it contradicts the well-established Subject Advantage. Second, we identified several methodological issues in their design that warranted further investigation.

In the present study, we found that when these methodological concerns are addressed, children are able to comprehend both SCs and OCs to approximately the same degree. This finding suggests that the Agent-first bias is not as robust as some might think, nor is it a “default” heuristic used ubiquitously, as some have suggested (e.g., Shin, 2021). Rather, we propose that the Agent-first Bias only becomes evident when children are faced with an infelicitous experimental

² One might consider whether a subject-object asymmetry exists in simple wh-questions in child Japanese. Research indicates that in the acquisition of wh-*in situ* languages, children do not appear to exhibit an asymmetry in either the comprehension or production of simple questions (Yoshinaga, 1996). A notable exception to this general pattern is Tok Pisin, as discussed by Sato and Deen (2018).

context where the expectations of the experiment on their grammar are unclear. Such infelicities cause a processing breakdown, leading children to rely on domain-general heuristics like the Agent-first bias as a viable alternative. However, once these methodological infelicities are removed, children are fully capable of employing their underlying linguistic knowledge, as demonstrated in our experiment.

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