A Snapshot of (Really) Early CP Occurrence: Sentence Final Particles in Child Japanese

Giulio Ciferri Muramatsu and Zixi Liu

1. Introduction

How do children develop an adultlike syntactic tree? Competing acquisition theories make different predictions regarding the order of acquisition. The prominent Growing Tree hypothesis (Friedmann et al., 2021) assumes a bottom-to-top acquisition order and predicts that CP-related structures are acquired the latest. On the contrary, the more recent Inward Growing Spine hypothesis (Heim and Wiltschko, 2025) and the Granularity account (Bosch and Biberauer, 2024) argue that CP-related structures can emerge early. To examine these competing theories, we will revisit the acquisition of Japanese sentence final particles (SFPs). SFPs are often associated with illocutionary acts. (1) is an example of the SFP *yo*, which signals certainty[1].

(1) Rei-wa iku yo.
Rei-TOP go yo.
'(I'm telling you that) Rei will go.'

It is well-known that Japanese SFPs can emerge in child speech very early, before age 2;00 (Clancy, 1985; Shirai et al., 2000, i.a.). Meanwhile, syntactically SFPs are associated with CP or even higher structures (Endo, 2020; Miyagawa, 2022; Miyagawa and Hill, 2025; Ueda, 2009, i.a.). Therefore, it seems that the early emergence of Japanese SFPs poses an empirical problem to the Growing Tree hypothesis. However, the early emergence alone does not disqualify the Growing Tree hypothesis, since emergence does not always entail knowledge. To ascertain if child uses of Japanese SFPs are really problematic for hypotheses predicting late CP-emergence, we need to examine if children show an adult-like knowledge of the SFPs in their uses. In addition, the Growing Tree hypothesis

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[1]Throughout this paper, we will adopt the following glossing conventions. TOP = topic marker, NOM = nominative case, ACC = accusative case, Q = question particle, COP = copula, MOD = modal, PFV= perfective marker

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makes clear predictions about the relative order in which structures emerge. It is not sufficient to simply show that SFPs generally appear early in development. Instead, we must compare SFPs that occupy higher positions in the syntactic structure with those in lower positions. This paper presents our corpus study that addresses these two issues by analyzing child spontaneous speech data. To give a quick preview, we will establish that the acquisition of Japanese SFPs is really problematic for the Growing Tree hypothesis. The paper is organized as follows: Section 2 will introduce the theoretical and empirical background, together with our research questions. Section 3 will discuss our corpus analysis. Section 4 will give a general discussion of our findings and their implications for the acquisition theories.

2. Background and Research Questions

2.1. Theories of the Acquisition of Syntactic Structure

Based on predictions regarding the developmental timeline of CP-related structures, acquisition theories can be broadly divided into three camps: late emergence accounts ('Late-CP'), early emergence accounts ('Early-CP'), and neutral positions that refrain from making temporal predictions (e.g., Rizzi's (1993) Truncation analysis). Here we focus on the first two.

Following a long-standing intuition in the literature that children's acquisition of syntax starts from the lower part to higher parts of the tree (Radford, 1990), the Growing Tree hypothesis (Friedmann et al., 2021) predicts that the syntactic tree is acquired bottom-up, and that CP-related structures emerge last. Based on Hebrew spontaneous speech data and repetition tasks, the authors argue that syntactic tree development proceeds through three stages mapped to the cartographic structure (Figure 1). Stage 1 (IP and VP) emerges first, followed by Stage 2 (low CP), then Stage 3 (high CP). Figure 1 below is a schematic representation of this, where A>B means A is structurally higher than B.

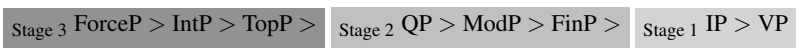

Figure 1: Stages in the Growing Tree Hypothesis (adapted from Friedmann et al. (2021)

The Growing Tree hypothesis makes specific predictions: 1) structures within the same stage emerge simultaneously despite height differences. 2) Structures in higher stages cannot be available to children before lower ones. This predicts that CP-related structures in Stage 2 and Stage 3 will be acquired after TP(IP)-related structures in Stage 1.

In the Early-CP camp, we can find the Granularity Account (Bosch and Biberauer, 2024) and the Inward Growing Spine Hypothesis (Heim and Wiltschko, 2025). Both accounts specifically propose that CP-related structures can emerge

earlier than lower structures. Bosch and Biberauer (2024) reject that syntactic tree development shows directionality, and propose that CP emerges as one of the earliest functional projections. Heim and Wiltschko (2025) propose that the syntactic spine grows 'inward' with increasing complexity, and that speech act related structures (traditionally high CP-structures) emerge earlier than lower structures such as TP.

In summary, existing theories make different predictions about the relative acquisition timeline of CP. As we will see in the following sections, Japanese SFPs are generally believed to occupy positions in the CP domain or higher, which will be crucial for determining which of these competing theories is correct.

2.2. Syntactic Properties of Japanese SFPs *yo*, *ne*, and *no*

The majority of SFPs in Japanese occupy high structural positions. Syntactically, they are heads of functional projections, situated in CP or even higher projections (Miyagawa (2022), but see Saito (2015)), which we will refer to as CP-related structures. The SFPs *yo*, *ne*, and *no* are going to be the focus of our study. While the exact interpretive contribution of SFPs are still under debate, there seems to be a consensus that *ne* requests agreement from the addressee, *yo* signals certainty of the speaker, while *no* can signal emphasis, finiteness, or evidentiality (Davis, 2011; Hiraiwa and Ishihara, 2012; Rieser, 2017; Saito, 2015, i.a.).

(2) a. ima ame-ga hutteru yo. — *yo*: signals speaker certainty
now rain-NOM falling yo
'It's raining right now.'

b. kyou-wa samui ne. — *ne*: requests agreement
today-TOP cold ne
'It's cold today, isn't it?

c. kore-wa hon na no. — *no*: emphatic
this-TOP book COP no
'This is a book!' (Fujimoto, 2008)

Evidence for syntactic heights of *yo*, *ne*, and *no* comes from embeddability and relative order, which are the two common tests for height of syntactic constituents at the clause periphery. These tests show that *yo* and *ne* are arguably the highest among SFPs – they are at least in CP, and higher than *no*. First of all, *yo* and *ne* cannot appear in embedded environments (3), but *no* can (4).

(3) Rei-wa [$_{CP}$Hanako-ga kuru (*yo/*ne) to] omotta.
Rei-TOP Hanako-NOM come yo/ne C thought
'Rei thought Hanako would come.'

(4) Rei-wa [$_{CP}$ame-ga furu no ka to] kiita.
Rei-TOP rain-NOM fall no Q C asked
'Rei asked if it would rain.'

We follow the common analysis here and take (3)-(4) to mean that compared to *no*, *yo* and *ne* occupy a high position in the CP, or even higher than CP. In general, the higher an element is in the left periphery, – particularly if it is related to illocutionary acts, the more difficult it is for it to be embedded. In English, too, there are comparable phenomena: certain transformations – which often involve fronting of certain stressed elements and arguably a larger-than-usual clause-size – cannot occur in embedded clauses (examples below from Hooper and Thompson (1973), p. 478):

(5) *It's likely that seldom did he drive that car. (adverb preposing)
(Hooper and Thompson (1973), (96))]

(6) *I forgot that playing in the concert was Artur Rubinstein. (participle prep.)
(Hooper and Thompson (1973), (106))

Another piece of evidence comes from an important feature of Japanese SFPs: stacking. This refers to multiple SFPs co-occurring at the end of a single sentence. Stacking follows a rigid linear order. As shown below, *yo* and *ne* follow *no*; *no* can precede but not follow *yo* and *ne*. Given that Japanese is head-final, this means that *yo* and *ne* are higher than *no*.

(7) Rei-wa soko-ni iru (no) yo/ne (*no).
Rei-TOP there-at is no yo/ne
'Rei is there.'

We follow Saito (2015) and assume that *no* is a Finite head that selects TP: *no* must occur after a tensed verb, and cannot follow a modal, as shown below.

(8) Rei-wa [ame-ga furu (*daroo) no]-o kitaishita.
Rei-TOP rain-NOM fall MOD no-ACC expected
'Rei expected that it might rain.'

Given our discussion above, we assume the positions of *yo*, *ne*, and *no* as schematized in Figure 2. This will become relevant for our corpus study in Section 3, where we examine the Growing Tree Hypothesis and its predictions on the SFP emergence order.

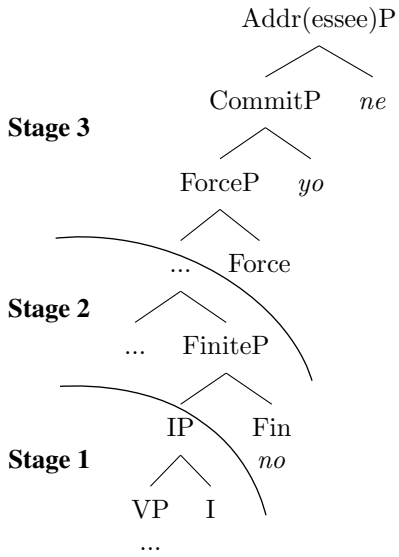

Figure 2: Japanese Right Periphery

To quickly summarize, we showed above that *yo*, *ne*, and *no* are all in CP-related structures and that *yo* and *ne* are higher than *no*.

2.3. Research Question: Acquisition of *yo*, *ne*, *no*

Recall that according to the Growing Tree hypothesis, syntactic structures are acquired bottom-to-top, which means the relative syntactic height predicts the order of emergence; Structures that belong to later stages should emerge later than structures belonging to earlier stages. It makes the following predictions regarding Japanese SFPs, which we will test in our corpus study.

(9) Predictions from the Growing Tree hypothesis

a. *yo* and *ne*, which belong to Stage 3 (Figure 1), should occur later than *no*, which belongs to Stage 2.

b. The early occurrences of *yo* and *ne* might not be adult-like, given that CP-related structures should be acquired late.

Before we introduce our study in Section 3, we will quickly review the current status of the acquisition research on Japanese SFPs and point out some gaps. Current research on the matter relies primarily on corpus analysis (except for (Matsui et al., 2006; Matsui, 2014)). They have successfully established the emergence order of Japanese SFPs in child speech. Research shows that SFPs appear early in development, with *yo*, *ne*, and *no* emerging before age 2;00 in some children

(Clancy, 1985; Shirai et al., 2000). Among these particles, some corpus studies also indicate that *yo* and *ne* emerge earlier than *no* (Fujimoto, 2008; Murasugi, 2014).

However, these foundational studies leave some important questions unaddressed: the apparent earliness of *yo* and *ne* may simply reflect frequency effects. A conceivable scenario is that *yo* and *ne* are observed earlier in child speech, not because they are acquired before *no*, but simply because they occur more frequently than *no* in child speech in general. In that scenario, their seemingly early emergence is just an accident due to their high frequency. A second critical question concerns whether children's early SFP usage is adult-like. This distinction is crucial for using Japanese SFPs to evaluate theories of syntactic acquisition. To establish early acquisition of CP-related structures, mere emergence is insufficient—we must demonstrate genuine knowledge. Regarding pragmatic competence, children show some awareness of *yo*'s pragmatic functions (Matsui et al., 2006) and can use *ne* in appropriate contexts (Murasugi, 2013, 2014). However, the literature lacks sufficient discussion of whether children's syntactic knowledge is adult-like. In fact, Murasugi (2013, 2014) raises a compelling possibility that early uses of *yo* and *ne* may not involve adult-like CP knowledge. She bases her claim on the fact that in adult grammar, *yo* and *ne* can also occur sentence-internally; we will refer to such instances as SIPs (sentence-internal particle), to distinguish them from SFPs. As SIPs, *yo* and *ne* can appear almost after any major constituent—which, following the arguments of Murasugi (2013, 2014), suggests an absence of CP structure.

(10) Rei-ga-(yo/ne) kinoo-(yo/ne) kooen-ni-(yo/ne) itta.
Rei-NOM-yo/ne yesterday park-to went
'Rei went to the park yesterday.'

Based on this, and that *yo* and *ne* are also the first ones to emerge in child speech, Murasugi proposes that initially, 'children do not fully know the (adult) syntactic properties of sentence final particles' (Murasugi (2014); p.154). We take this to mean that children initially represent these particles syntactically as SIPs rather than true SFPs. If correct, early use of *yo* and *ne* would not demonstrate CP knowledge and could not support Early-CP theories.

Our study thus addresses two key questions based on (9): 1) Do *yo* and *ne* emerge significantly earlier than *no* when controlling for frequency? 2) Can we determine whether adult-like syntactic knowledge underlies early uses of *yo* and *ne*? To give a spoiler, the answer is yes to both questions.

3. Corpus Studies

3.1. Methods

We conducted a corpus study to test the questions above. We examined utterances from three children (Asato, Nanami, and Tomito) in the MiiPro corpus, from

the CHILDES database (Miyata and Nisisawa, 2009, 2010a,b). We examined utterances up to age 3;00, when all children seem to have acquired the relevant SFPs. Table 1 is a summary of the basic information of the consulted portion of the corpus.

Table 1: Corpus Information

Child	Files	Age Range	Total Utterances	MLU-w range
Asato	46	1;01.27 – 3;00.01	20056	1.00 ∼2.45
Nanami	37	1;01.29 – 3;00.14	17074	1.00 ∼2.78
Tomito	44	1;02.10 – 3;00.13	21207	1.00 ∼3.08

The time of emergence of SFPs was measured by their First of Repeated Uses (FRU) (Snyder, 2007), defined as the first clear use followed by a repeated use (by latest in the next file). Using the CLAN 'combo' command, we searched for all utterances ending with *yo* and *ne*, and their alternate forms *yoo* and *nee*. As for *no*, we searched for utterances with *no* and its phonological alternation *n* tagged as QUD in the %mor tier.

3.2. Findings

Our findings are summarized in Table 2 and Figure 3. Figure 3 visually presents the FRU of each SFP, and occurrences of *yo* and *ne* before *no* for each child. For example, Asato has used *yo* 31 times before *no* emerges.

Table 2: FRU and total occurances for *yo*, *ne*, and *no*

Name	SFP	FRU	Total Occurrences (∼3;00)
Asato	yo	1;02.23	691
	ne	1;03.05	317
	no	1;10.11	555
Nanami	yo	1;03.22	542
	ne	1;09.28	281
	no	1;11.10	802
Tomito	yo	1;07.11	1201
	ne	1;08.23	458
	no	1;11.03	1090

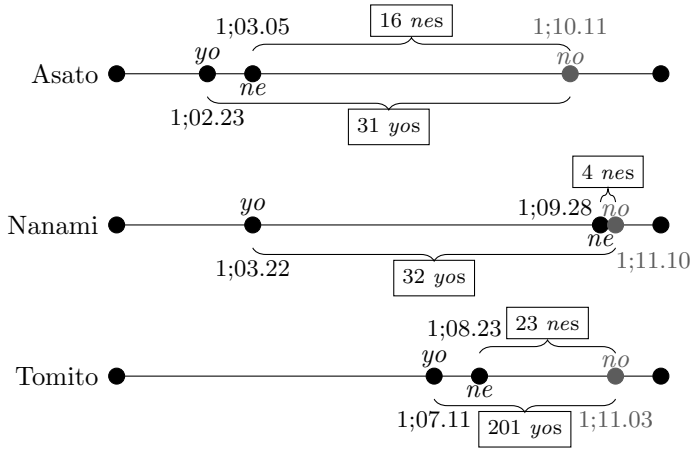

Figure 3: Emergence timeline of *yo*, *ne*, and *no*

Firstly, our findings concur with the literature (Clancy, 1985; Shirai et al., 2000) that SFPs can emerge quite early. All three particles emerged before age 2;00 with the three children, with some emerging even at around age 1;03. We also confirm the findings (Fujimoto, 2008; Murasugi, 2014) on the order of emergence among the particles; *yo* and *ne* do in fact emerge earlier than *no*. Fujimoto (2008) found this with Aki, Ryo, and Tai from the Miyata corpus (Miyata, 2012), and Murasugi (2013, 2014) with Sumihare from the Noji corpus (Noji, 1973). While these two studies observed this in a qualitative fashion, we were able to confirm the order statistically. A binomial test, based on the relative frequency of the particles in child utterances, confirmed that *yo* and *ne* were indeed significantly earlier than *no* with all three children ($p < 0.01$ for all cases). Furthermore, we found that input frequency cannot reliably predict the order of emergence of these particles. With Asato and Tomito, *no* is the last to emerge despite being the most frequent in the input, while the less frequent *yo* and *ne* emerge earlier (Table 3). The FRU information is repeated in Table 3 for ease of illustration.

Table 3: FRU and input frequency for *yo*, *ne*, and *no*

Name	SFP	FRU	Input frequency (per 1000 utterances)
Asato	yo	1;02.23	41.6
	ne	1;03.05	64.0
	no	1;10.11	66.5
Nanami	yo	1;03.22	63.7
	ne	1;09.28	63.5
	no	1;11.10	55.6
Tomito	yo	1;07.11	53.0
	ne	1;08.23	60.6
	no	1;11.03	91.5

Summarizing the findings discussed so far, for all children, *yo*, *ne*, and *no* emerge before age 2;00. In addition, *yo* and *ne* are both earlier than *no* for all children, even though *no* is more frequent for two of the three children.

Now, let us get back to the concern raised in Section 2.3. The mere emergence of an SFP does not necessarily reflect its acquisition (or the adult-like knowledge of its syntactic properties). With this in mind, we searched for SFP stacking in child utterances. Recall that in the adult grammar, SFP stacking always has rigid orders, stemming from the relative height of the stacked particles. Thus, the correct stacking order is *no-ne*, *no-yo*, *yo-ne*, while their order-reversed counterparts are incorrect. We specifically examined whether children are aware of this order restriction of SFPs. Results are shown in Figure 4.

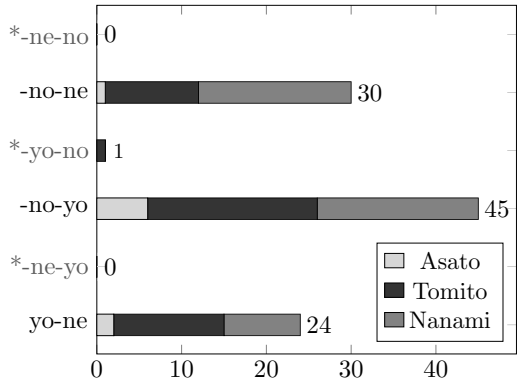

Figure 4: *yo*, *ne*, and *no* stacking in child speech

We found that for all three children, they not only produce SFP stacking of *yo*, *ne*, and *no*, but also never make mistakes in the stacking order[2]. We take this to mean that children are adult-like in their knowledge of the order restrictions of SFPs, and therefore of their syntactic properties, given that the order reflects a mapping from the relative structural heights[3]. We report an example of stacking from Nanami.

(11) kore nagai yo ne. [Nanami, 1;11.10]
this long yo ne
'This is long, right?'

We bring in another argument from the child SFP stacking cases to argue for their knowledge of CP-related structures. Recall Murasugi's concern that children might initially analyze *yo* and *ne* as SIPs, which means that their early uses of them do not imply knowledge of CP-related structures. The relevant SIP example is repeated below.

(12) Rei-ga-(yo/ne) kinoo-(yo/ne) kooen-ni-(yo/ne) itta.(=10)
Rei-NOM-yo/ne yesterday park-to went
'Rei went to the park yesterday.'

We observe that in the adult grammar, apart from the positions in the sentence, SIPs and SFPs also differ in one crucial aspect, which can help us distinguish the two. SFPs allow stacking, but SIPs do not. This is shown below: in the adult grammar, although *yo* and *ne* can occur sentence-internally on their own, stacking of *-yo* and *-ne* is acceptable only in the sentence-final position.

(13) Rei-ga(*-yo-ne) kooen-ni(*-yo-ne) itta-yo-ne.
Rei-NOM-yo-ne park-to went
'Rei went to the park.'

---

[2]We found one case of apparent error, shown below.

(i) Un datte ki-tchatte ii yo no da yo [Tomito 2;11.12]
yes because cut-PFV good yo n COP yo
'Yes, because it's ok to cut it.'

Here, the first *yo* occurs before *no*, which is not adult-like. Given the singularity of this example, and that the same SFP *yo* was repeated twice, we suspect that this is a speech error.

[3]See Sugisaki and Ogawa (2022) for discussion on similar findings with SFPs *ka* and *to*.

Crucially, in all the child examples we consulted, stacking only occurs in the sentence-final position, and not in sentence-internal positions. We thus take stacking of *yo* and *ne* in sentence-final positions to mean that children analyze them as sentence-final particles, and not sentence-internal particles. This suggests that children are aware that sentence-final particles require syntactic representation of a clause, and potentially CP-related structures.

In summary, in this section, we show that *no* emerges later than *yo* and *ne* in child speech when controlling for utterance frequency. Furthermore, the late emergence of *no* does not seem to be stemming from input frequency. Lastly, with SFP stacking, we suggest that children have an adult-like syntactic knowledge of SFPs.

3.3. Implications

Our findings show that *yo* and *ne*, despite being in a higher syntactic position than *no*, are acquired significantly earlier. They do not simply emerge earlier, but children appear to have an adult-like knowledge of these particles' syntactic properties. This means that Japanese-speaking children's acquisition of CP-related structures cannot proceed in a bottom-up way – contrary to Growing Tree hypothesis's prediction, according to which the higher *yo* and *ne* should emerge later than the lower *no*, contrary to our study's findings. Our results are in line with Early-CP approaches, such as the Inward Growing Spine Hypothesis (Heim and Wiltschko, 2025) or Bosch and Biberauer's (2024) finding that CP-structures such as illocutionary particles can emerge early.

We have not addressed a very important question. What exactly is the reason *no* emerges later than *yo* and *ne* so consistently? We think there are syntactic and semantic/pragmatic explanations worthy to be explored. For example, the crucial syntactic difference between *yo* and *ne* on the one hand, and *no* on the other, is their selectional requirements. *yo* and *ne* can occur after (almost) any constituent sentence-finally, which means that they do not have any selectional requirement. *no*, on the other hand, selects for TP (Saito, 2015, i.a.). One could stipulate that it is this additional syntactic knowledge of *no* that contributes to its delay relative to *yo* and *ne*. Similarly, *yo*, *ne*, and *no* differ in their semantic/pragmatic contribution. Both *yo* and *ne* have a clear communicative function. *yo* signals strong speaker commitment, while *ne* asks for addressee commitment. In contrast, *no* can have different functions concerning semantic/pragmatic import. It can signal evidentiality (Davis, 2011; Sudo, 2013, i.a.), but it also marks finiteness (Hiraiwa and Ishihara, 2012; Saito, 2015), to name two. This multifunctionality of *no* could be making its acquisition harder compared to the more transparent *yo* and *ne*. The exact function of these particles in the adult grammar is still under debate (Davis, 2011; Miyagawa, 2022; Matsumoto, 2023; Sudo, 2013, i.a.), and there is much more research left to be done on this matter.

4. Conclusions

In this study, we presented the findings from our corpus study of the acquisition of Japanese SFPs. We inspected the order of emergence among three particles, *yo*, *ne*, and *no*, in the utterance data of three children from the MiiPro Corpus (Miyata and Nisisawa, 2009, 2010a,b). By considering their frequency in child utterances, we were able to confirm statistically that *yo* and *ne* emerge earlier than *no*. Furthermore, based on examples of SFP stacking, we argued that child usage of these particles is backed up by adultlike syntactic knowledge. These findings have direct implications for the different acquisition theories of CP-related structures. The fact that *no*, much lower than *yo* and *ne*, is acquired later than the higher *yo* and *ne*, is problematic for theories assuming a bottom-up acquisition (Friedmann et al., 2021) and potentially support the Inward Growing Spine hypothesis (Heim and Wiltschko, 2025), or the Granularity account (Bosch and Biberauer, 2024).

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