Word order matters: A study on early syntax

Anna Gavarró

Universitat Autònoma de Barcelona

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Introduction

There is extensive evidence for early parameter setting in the syntactic productions of young children (Wexler 1998), much less is known about parameter setting before production starts. Here I report results on the early syntax of Hindi-Urdu replicating former results by Franck, Millotte, Posada and Rizzi (2011) on French on early sensitivity to word order parameters in infants.

An example from French

(1) Jean (n')aime pas Marie.
Jean loves NEG Marie
"Jean doesn't love Marie."

(2) (Ne) pas sembler hereux est une condition pour écrire des romans.
NEG seem happy is a condition to write D novels
"Not to seem happy is a prerequisite to write novels."

(3) *Jean (ne) pas aime Marie.

(4) *Ne sembler pas hereux est une condition...

An example from French

(5) Pas manger la poupée. Nathalie, 1;9
NEG eat-INF the doll

(6) Elle roule pas. Grégoire, 1;11
she works NEG

An example from French

Results by Pierce (1992), based on data from Philippe, Nathalie and Daniel, age range 1;8-2;3

(7)

	+fin	-fin
V NEG	173	2
NEG V	9	122

Early parameter setting

Very Early Parameter Setting (Wexler 1998)
Basic parameters of verb movement, e.g. V to I, V to I to C, are correctly set at the earliest observable stages (i.e. at the beginning of production of multiple word combinations, around 1;6).

A word order macro parameter

(8) [**describing** [the extraordinary events]]
(9) [**the** [extraordinary events]]
(10) [**in** [our town]]
(11) [**events** [which took place so recently in our town]]
(12) [**introduction** [to the social and political chronicle]]

A word order macro parameter

(13) Raajiiv-ne [ciTThii **likh-ii**] thii.
Rajiv-ERG letter write-PERF was
"Rajiv had written a letter."

(14) Ravi-ne [Sariita **ko**] kapRe di-ye.
Ravi-ERG Sarita to clothes give-PERF
"Ravi gave clothes to Sarita."

(15) Ravi-ne Sariitaa se [[suman kaa] **saamaan**] [kamare **me**] rakhne ko k
Ravi-ERG Sarita to Suman of things room in put to say-PERF
"Ravi told Sarita to keep Suman's luggage in the room."

A word order macro parameter

(16) Siita-ne kahaa thaa [ki Mohan aayaa thaa]. S V Aux CP
Sita-ERG say-PFV AUX-PST that Mohan come-PFV AUX-PST
"Sita said that Mohan had come."

(17) *Siita-ne [ki Mohan aayaa thaa] kahaa thaa . *S CP V Aux

(18) **ki** [Mohan aayaa thaa]

A word order macro parameter

(19) [Spec [X Complement]]
(20) [Spec [Complement X]]

The availability of (20) has been questioned (Kayne's antisymmetry); if there is no directionality parameter a such, (20) results from movement of the complement.

Antecedents

- Hirsch-Pasek and Golinkoff (1996) initiated the research on sensitivity to word order in infants by resorting to the preferential looking paradigm.
- They showed that 17-month old children comprehend active sentences such as (21) even though they are reversible, i.e. children are capable of identifying Agent and Theme on the sole basis of word order.

(21) Big Bird is washing Cookie Monster.

- In and of itself this result does not demonstrate that children are aware that in a language like English objects follow the verb.

- There is the possibility that children take the first argument to be the AGENT, given that the theta role is assigned to a specifier position, or that they had learned the sentences in the experiment without abstract knowledge of English syntax.
- It is also possible that children have memorized the verb templates in the experiment (see the objections of Dittmar, Abbot-Smith, Lieven and Tomasello (2008) to Gertner, Fisher and Eisengart (2006)) - but see Franck and Lassotta (2012).

Franck, Millotte, Posada and Rizzi (2011)

- Franck, Millotte, Posada and Rizzi (2011) designed an experiment testing awareness of the VO/OV contrast by children exposed to a VO language: French.
- They combined the preferential looking paradigm with the use of pseudo-verbs to preclude the possibility that children were able to understand sentences by simply having memorised similar verbal templates as suggested by Dittmar et al. (2008).
- They also resorted to the weird word order paradigm (Akhtar 1999), in which children are confronted to grammatical and ungrammatical sequences.

Franck et al.: Materials

- Nineteen 19-month old children natively exposed to French heard sentences such as (22), a well-formed SVO sentence of French, and (23), SOV, ill-formed.

(22) Le lion poune le cheval.
the lion pseudo-verb the horse

(23) La vache le lion dase.
the cow the lion pseudo-verb

Franck et al.: Method

- Two synchronised videos were shown to the children; in one of the screens, a causative action was portrayed (a character performing an action on the other character), in the other screen the same action was performed reflexively (each character performed on himself).
- By hypothesis, children able to parse (22) as a transitive SVO sentence would look at the causative action longer than at the non-causative.

Franck et al.: Results

- This preference was found when the children heard the grammatical transitive sentence (22), while no preference was found when they heard the ungrammatical sentence (23).
- Therefore the conclusion of these eye-tracking measures is that children exposed to French have set, at 19 months, the parameter that determines the VO/OV alternation according to the adult setting.

Goals

- Our goal is to replicate the experiment on French in a language with another word order choice, an OV language.
- We hypothesise that, as in French, children at 19 months will have acquired an abstract word order pattern according to the target grammar and thus will be able to parse an SOV sentence.

Rationale

- Early word order parameter setting predicts (i) above-chance looks at a transitive representation in the DP DP V condition (which conforms to SOV), and (ii) chance performance in the ungrammatical V DP DP condition (unless performance is guided by an SO bias, in which case a preference for the causative representation should also be found).
- Cf. the predictions of the item-based word order hypothesis: chance performance in both conditions since the verbs used are unknown to the children.

A sketch of Hindi-Urdu syntax

- Hindi-Urdu is SOV (in fact the language is consistently head-final), and argument DPs bear morphological case (*ne* in *Ram-ne* for Ergative, *ko* in *Raavan-ko* for Accusative).
- Word order alternations from (24) are possible as a result of focusing or topicalisation (25).

(24) Raam-ne Raavan-ko dekhaa.
Ram-ERG Ravan-ACC see-PFV
'Ram saw Ravan.'

Word order variation

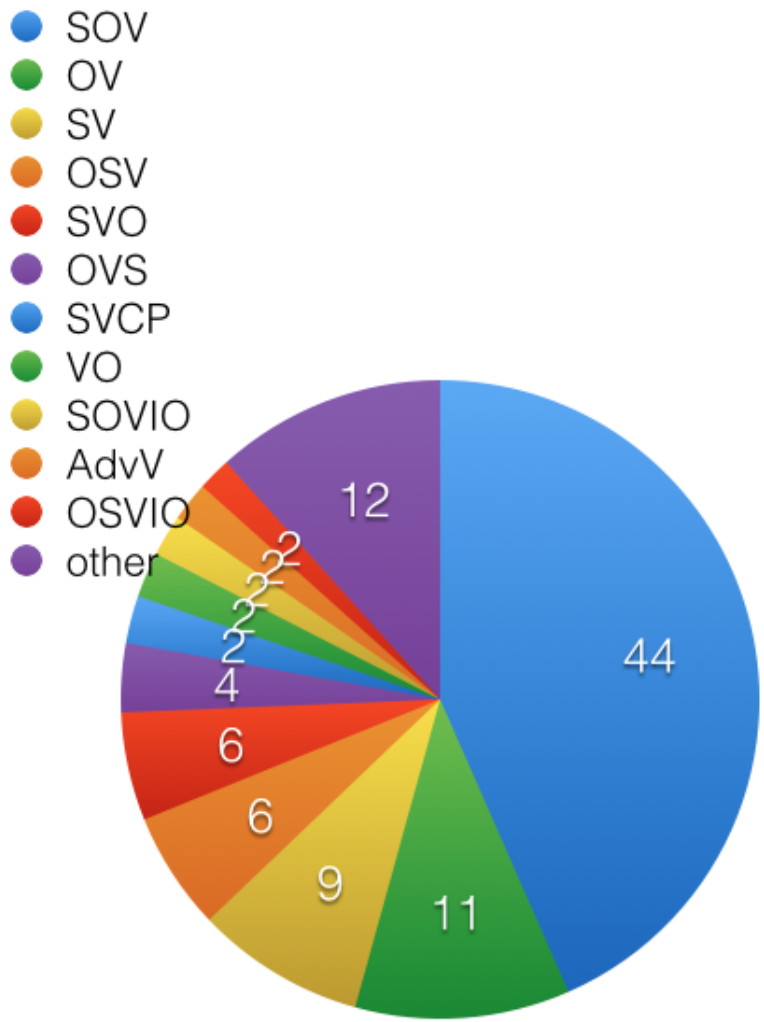
(25)
a. Raam-ne dekhaa Raavan-ko SVO
b. Raavan-ko dekhaa Raam-ne. OVS
c. Dekhaa Raavan-ko Raam-ne. VOS
d. Dekhaa Raam-ne Raavan-ko. VSO
...

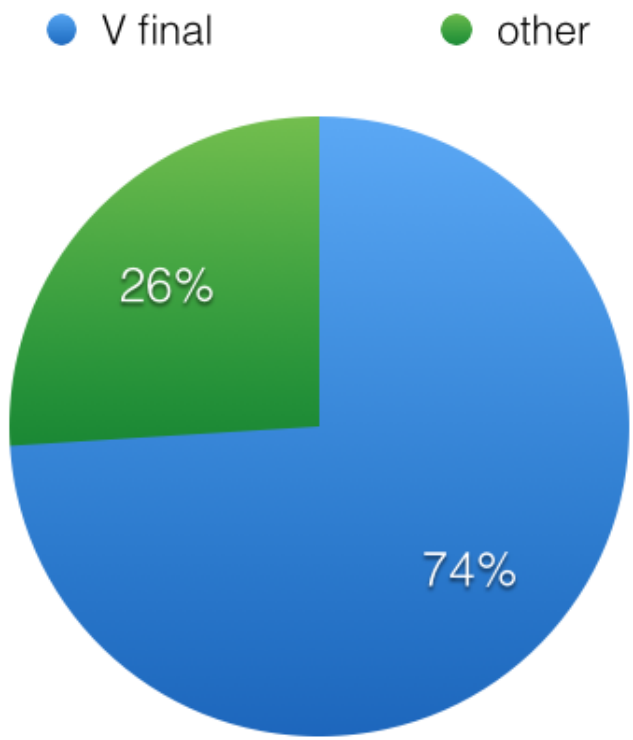
- For discussion of these departures from the basic word order, see Mahajan 1990, 1997, Kidwai 2000, Manetta 2012.

Word order variation

- In order to establish the distribution of the basic word order DP DP V in spoken Hindi-Urdu, a corpus study was carried out.
- We considered the transcriptions of spoken language taken from dialogues recorded in the *NavBharat Times*. A total of 5200 sentences were transcribed and analysed.
- All declarative and interrogative clauses were included in the recount.

Spontaneous production

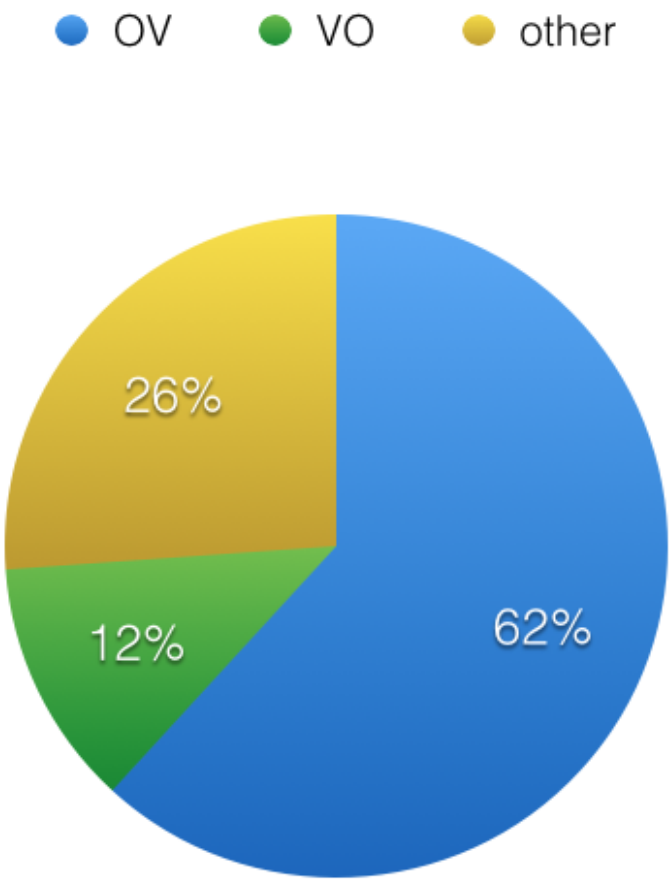




Spontaneous production

- Verbs appear predominantly in final position (73.6% of the total).
- Sentences with an overt object represent 81.9% of the total. Of these, the sentences in which there is direct evidence for the OV order (without any intervening material) represent 72% (61.5% of the total number of sentences).
- Sentences with the VO sequence constitute only 13.8% (11.8% of the total number of sentences)
- Thus, over 70% of the sentences containing an object display OV order.

Spontaneous production



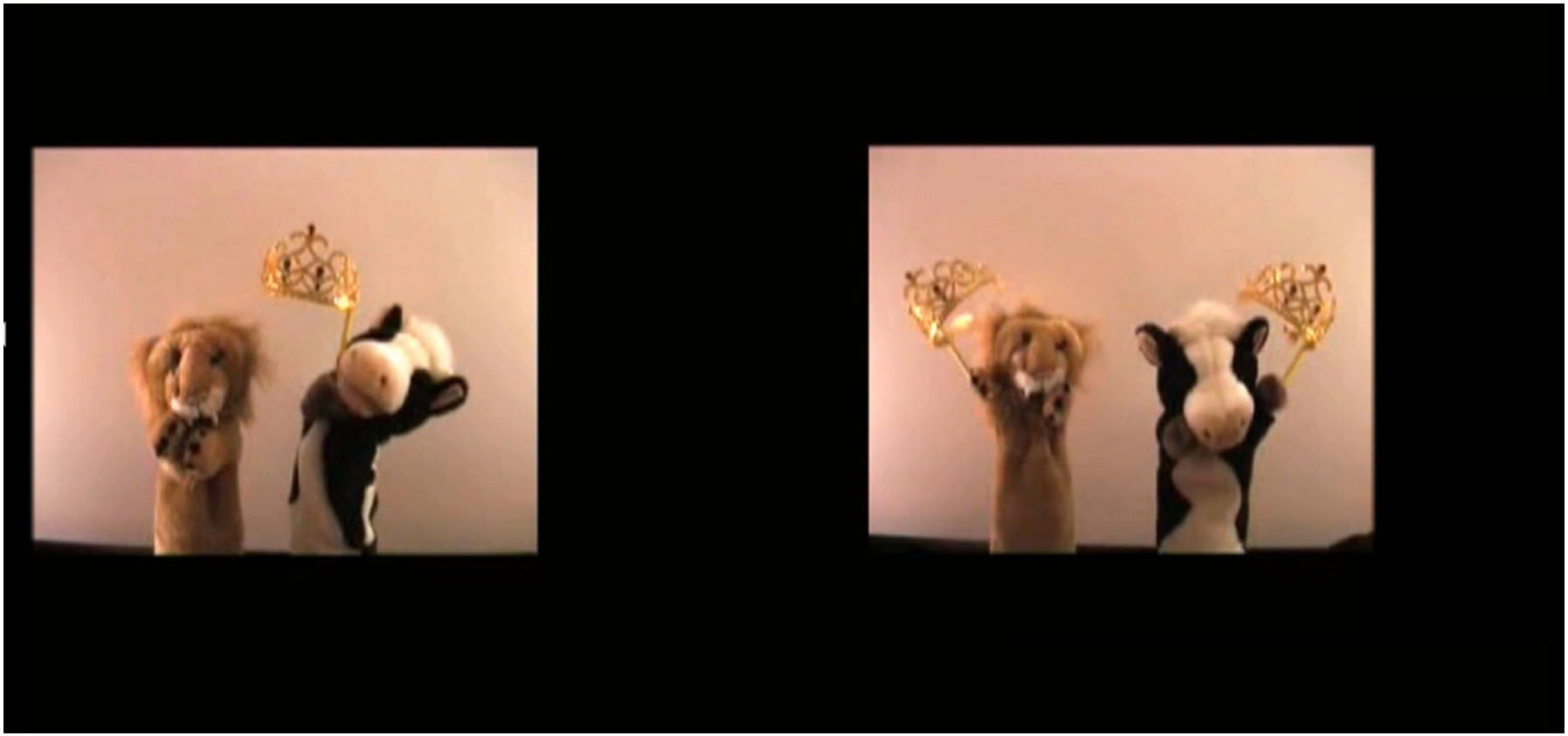
Our experiment: Subjects

- We replicated Franck et al's experiment with children exposed to Hindi-Urdu recruited in the metropolitan area of Barcelona.
- The participants in our experiment were twenty children of 19 months (age range: 1;7,2-1;7,7, mean age: 1;7,4).
- None of the children had a family history of language delay, language impairment or cognitive impairment. No child performance was excluded from the final analysis.

Materials

- The materials involve videos depicting causative and non-causative actions and two types of linguistic input: for Hindi-Urdu, well formed transitive DP DP V sentences and ill formed V DP DP sentences.
- The order VSO was chosen (instead of SVO as in the French experiment) because of its infrequency in adult spontaneous production: SVO was found in our recounts in 5.5% of sentences, VSO (with a different intonation) in only 1%. The critical condition SOV was kept.
- Having a reflexive action as distractor allowed us to have the same characters as in the target sentence as well as the same action performed.

Materials



Materials

- Two pseudo-verbs were formed combining the most commonly occurring syllables in Hindi-Urdu: the bisyllabic verb *choonna* (third person: *choona*) and the trisyllabic verb *khalaanaa* (third person: *khalaayaa*).
- The meanings assigned to the pseudo-verbs correspond to actions non-lexicalised in Hindi-Urdu: *choonna* to 'put someone's head under a net' and *khalaanaa* to 'put a crown on someone's head'.

Materials

(26) Kuthe-ne gadhe-ko khalaayaa. SOV
dog-ERG donkey-ACC V-PFV

(27) Choona gaay-ne sher-ko. VSO
V-PFV co-ERG lion-ACC

(28) [[L*H] [L*H] [H*L]]
(Patil et al. 2008, Féry 2010)

- There were 3 items of each type (grammatical vs. ungrammatical).
- The position of the causative video was counterbalanced across the experiment.

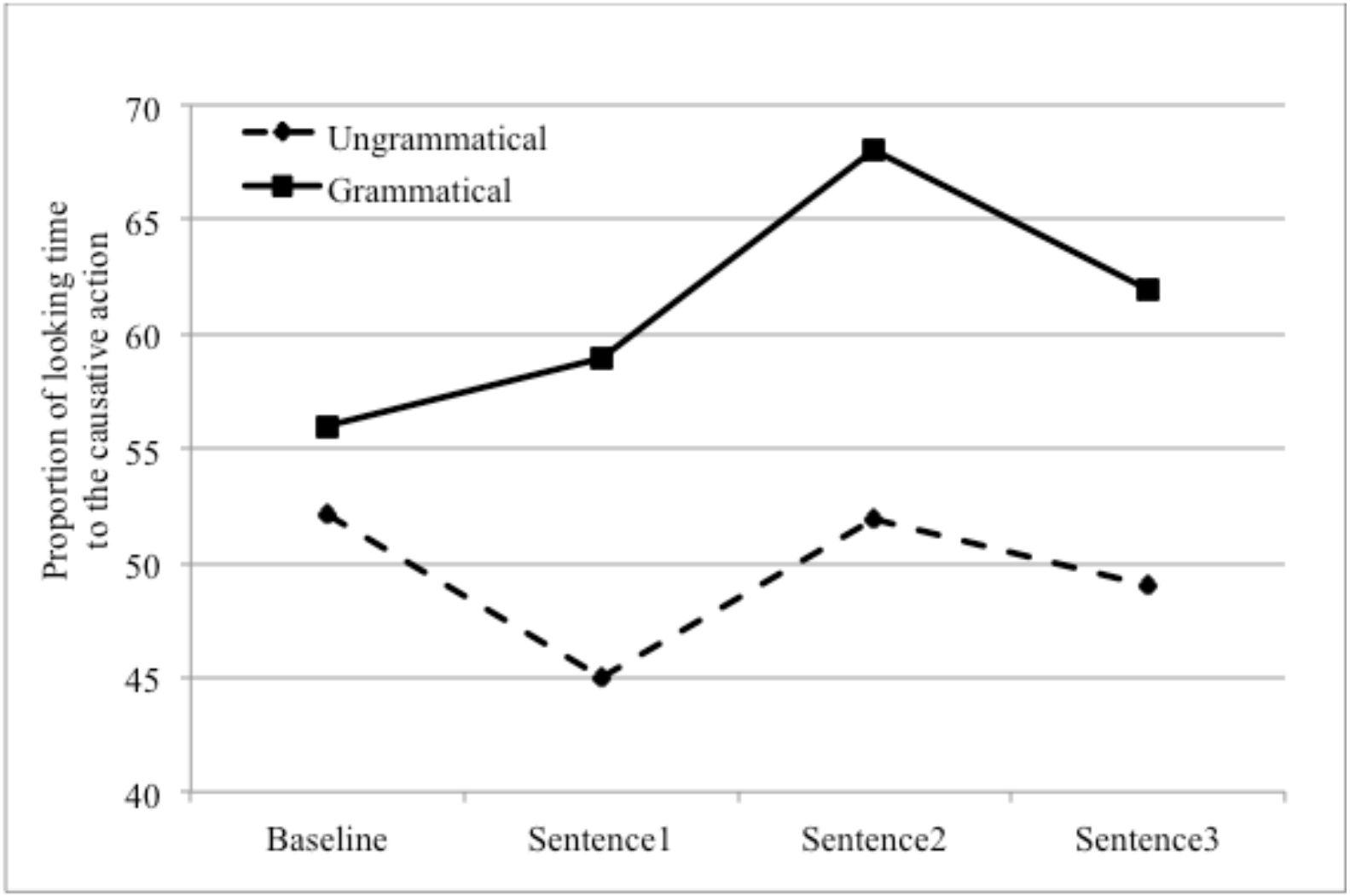
Materials

- Each pair of videos included four 4-second windows (presentation of the baseline sentence *Look! What is this?* at 2 seconds - 6 seconds, first presentation of the sentence at 6 seconds - 10 seconds, second presentation of the sentence at 10 seconds - 14 seconds, third presentation of the sentence at 16 seconds - 20 seconds).
- Transitions between the experimental pairs consisted in a blank screen followed by a cartoon.

Analyses

- Analyses were conducted on the four 4-seconds windows, defined on the basis of the timing of the linguistic input.
- We report mean looking times (in milliseconds) for the two videos in the two experimental conditions.

Results

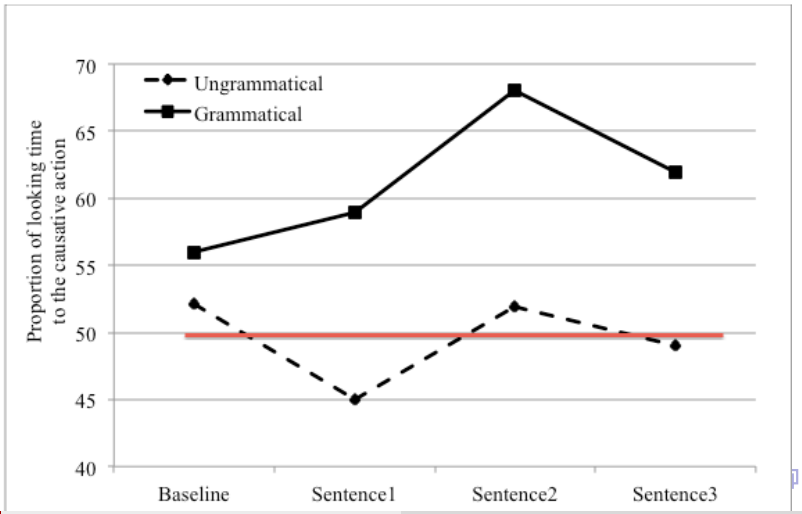

Ungrammatical
Grammatical
Proportion of looking time to the causative action
70
65
60
55
50
45
40
Baseline
Sentence1
Sentence2
Sentence3

Proportion of looking time to causative video

- The comparative analysis of gazing proportions to the causative video in the grammatical and ungrammatical sentences showed significantly higher proportions in the grammatical condition than in the ungrammatical condition during the second presentation of the sentence (Medians: 72.21 and 52.53 respectively; Z = - 1.979, p = .048).
- No significant difference was found in the baseline window and during the first and third presentations of the sentence.

Proportion of looking time to causative video

- Analyses were conducted on these proportions using the Wilcoxon signed-rank test.
- The analysis against chance level (defined as 50%) showed above chance performance in the grammatical condition during the second presentation of the sentence window (Median proportion = 72.21; Z = - 2.987, p = .003) as well as during the third presentation of the sentence window (Median proportion = 60.93; Z = - 2.128, p = .033).
- None of the other windows showed above chance performance.



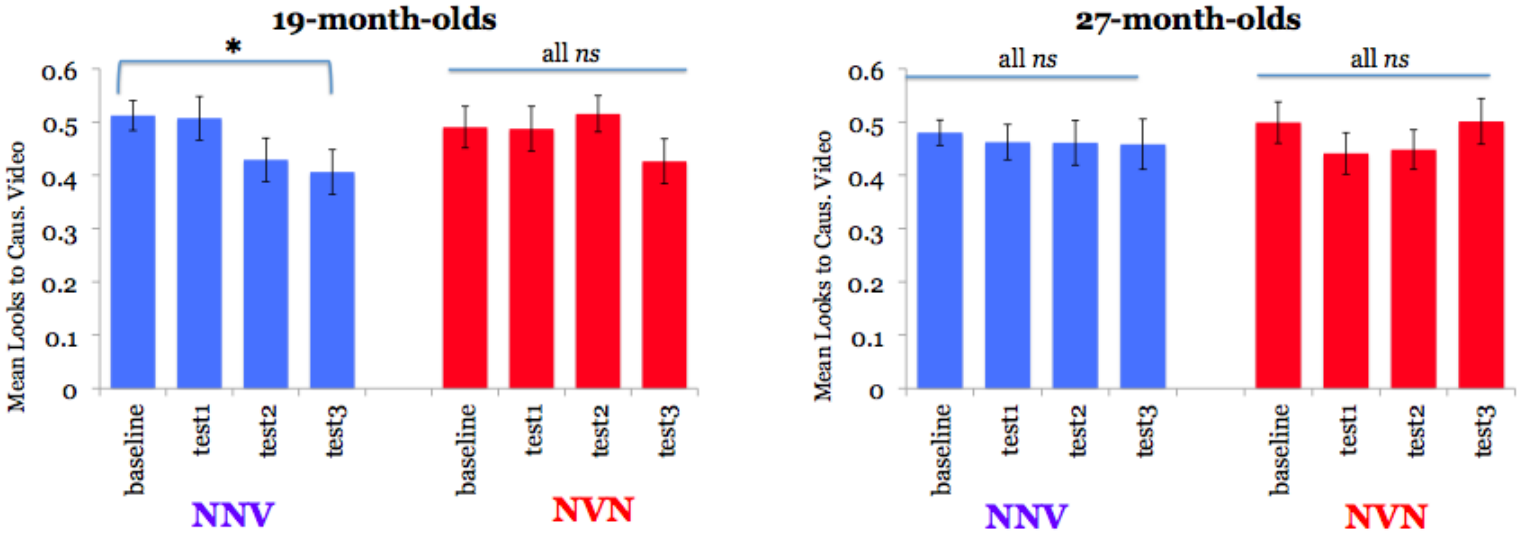
Discussion: Japanese

- Omaki, Kobayashi, Lassotta, Rizzi and Franck (2012) tested Japanese.
- The word orders used in the experiment were SOV and SVO, exactly as in the French experiment (judgments on these word orders are diametrically opposed in French and Japanese).
- Three groups of children, aged 19, 27 and 32 months, were tested.

(29) Wanchan-ga nekochan-o neketteru. SOV
dog-NOM cat-ACC blicking

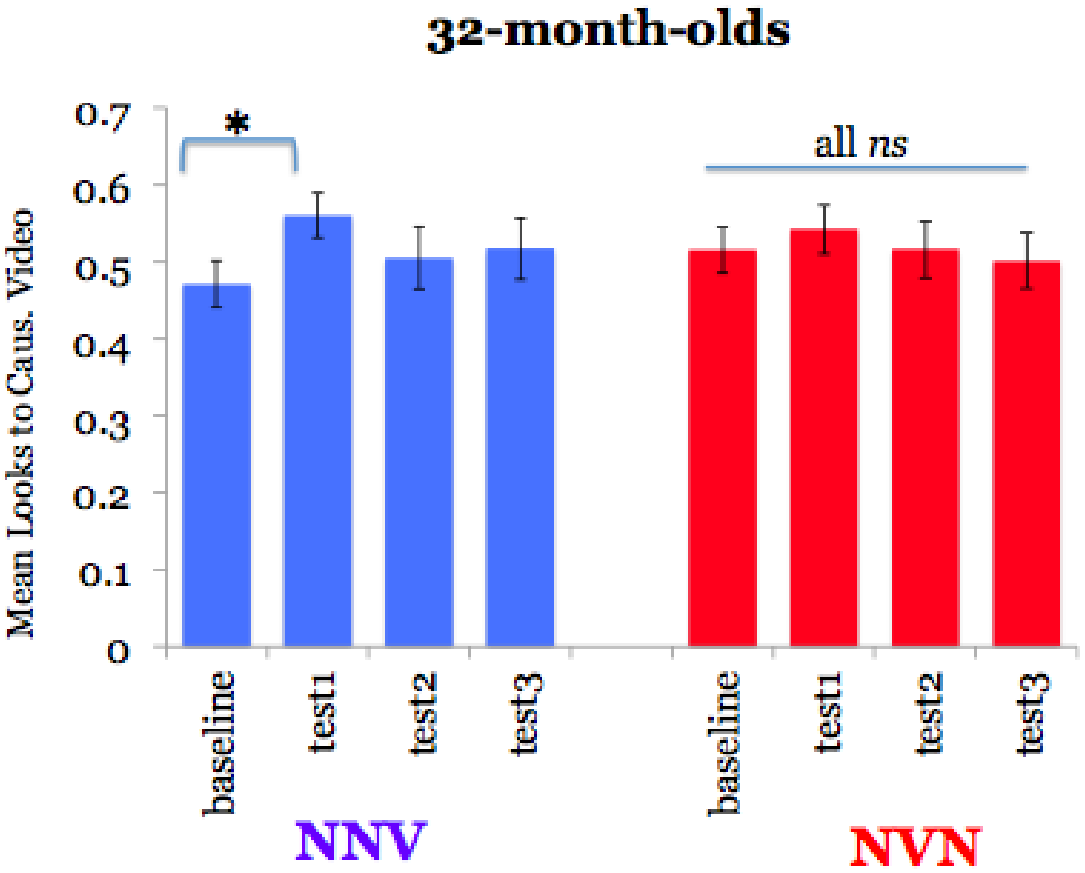
(30) (*)Wanchan-ga neketteru nekochan-o. SVO
dog-NOM blicking cat-AC

Discussion: Japanese



- No difference in performance was found at 27 months of age, and at 19 months children looked preferably longer to the non-causative event during the grammatical SOV sequence. Omaki et al. (2012) argued that this last result may be the effect of the children treating the DP DP sequence as a coordinate structure

Discussion: Japanese



Discussion: Japanese

- The relatively delayed parsing of the grammatical SOV structure (at 32 months) is attributed by Omaki et al. (2012) related to the fact that Japanese allows null arguments, while French requires overt arguments.
- This has a reflection on the input the children get: in Japanese, only 8.9% of sentences in child-directed speech (in the Miyata corpus) are SOV, and 87.9% contained only one argument, while in French child-directed speech (from the Lyon corpus) 39.4% of sentences were SVO, thus providing more consistent evidence for the child for the target word order.

Discussion: Japanese

- The two arguments by Omaki et al. are questioned by the results for Hindi-Urdu.
- The sequence DP DP was also given to the Hindi-Urdu children, but they didn't take it to be a coordinated structure.
- The presence of null arguments is also shared by Japanese and Hindi-Urdu (31), but this not give raise to delay in comprehension in Hindi-Urdu.

(31) Kal dekhoongi.
tomorrow see-FUT
'(I) will see (it) tomorrow.'

Conclusion

- Hindi-Urdu children are aware at 19 months of age that the language they are exposed to is an OV language.
- Children fail to comprehend VSO in the same experimental setting; the source of the difference in performance lies in the ungrammaticality of VSO with the associated intonational contour.
- Since pseudoverbs were used and no traning took place, performance cannot be explained by item-based lexical knowledge (cf. Abbot-Smith, Lieven and Tomasello 2001, amongst others). Appealing to an AGENT first strategy doesn't account for the results either.

Conclusion

- Our results for Hindi-Urdu are to be expected if we assume a directionality parameter that can be set as either head initial (French) or head-final (Hindi-Urdu).
- If we follow Kayne's (1994) antisymmetry, both French and Hindi-Urdu are underlyingly SVO and the contrast VO/OV follows from object raising in Hindi-Urdu. The implication of the results is then that the parameter resulting in object raising is correctly set by 19 months.
- There would have been the possibility that this additional movement had delayed the Hindi-Urdu children with respect to the French, but this is not the case. Therefore the experiment does not bear on these two contending hypothesis, but is the first experimental result showing setting of OV at 19 months.

Thank you.

Selected references

[1] Abbot-Smith, K., E. Lieven & M. Tomasello (2001) What pre-school children do and do not do with ungrammatical word orders. *Cognitive Development* 16: 679-692.

[2] Franck, J., S. Millotte, A. Posada & L. Rizzi (2011) Abstract knowledge of word order by 19 months: an eye-tracking study. *Applied Psycholinguistics* 34(2): 323-336.

[3] Hirsch-Pasek, K. R. & R. M. Golinkoff (1996) Object clitic omission in French-speaking children: effects of the elicitation task. *The Origins of Grammar*. The MIT Press: Cambridge, MA.

A recent study on non-canonical word order

- Lassotta, Omaki and Franck (2014), BUCLD presentation, tested clitic left dislocation constructions (32) with a method similar to ours. They also tested canonical SVO sentences.

(32) Le garçon la fille le dase
the boy the girl cl-masc V
'The boy, the girl Vs.'

A recent study on non-canonical word order

- They tested 40 French-learners aged 22 months (range 18-24).
- OSV represents 8% of the input the children get, and 32% of non-canonical sentences.
- Cf. the results of Dittmar, Abbot-Smith, Lieven and Tomasello (2008) for German where evidence for comprehension on non-canonical words order was only found at 7.

Proportion of looks to 1st AGENT