

The (Non-) Effect of Input Frequency on the Acquisition of Word Order in Norwegian Embedded Clauses

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1. INTRODUCTION

In this paper we show that input frequency plays a role in the acquisition of word order, but only combined with other factors. Two constructions with similar input frequencies are investigated: embedded questions and (all) embedded clauses with negation. It is shown that the lack of input cues for the target word order in embedded clauses with negation leads children to overgeneralize main clause word order in these cases (producing structures with verb movement across adverbs/negation). However, a similar lack of input cues for word order in embedded questions does not lead to overgeneralization (the production of structures with verb movement across the subject). This is explained within a Split-CP model of clause structure and a weak continuity structure-building approach to language acquisition where input and economy principles interact in the development of word order. While children have to rely on input to acquire the word order in the IP domain of the clause, UG provides them with the information that embedded questions are different from main clause questions with respect to illocutionary force. Consequently children do not project the same functional architecture for the two constructions, and overgeneralization of features from main to embedded questions is therefore impossible.

2. THE WORD ORDER OF NORWEGIAN

- Norwegian is V2 language with obligatory verb movement to the second position in main clauses, but generally no verb movement in embedded clauses:

- (1) Ifjor så John en llama.
last-year saw John a llama
'Last year John saw a llama.'
- (2) John liker ikke tog.
John likes not trains
'John does not like trains.'
- (3) Har du hørt [hvorfor John {*liker} ikke {liker} tog]?
have you heard why John {likes} not {likes} trains
'Have you heard why John doesn't like trains?'
- (4) Har du hørt [hvorfor {*liker} John {liker} tog]?
have you heard why {likes} John {likes} trains
'Have you heard why John likes trains?'

- Optional verb movement in *that*-clauses that are complements of so-called *bridge* verbs (*say, know, tell, believe, etc.*):

- (5) Hun sa at John {reiste} ikke {reiste} til Peru nå lenger.
she said that John travelled not travelled to Peru now longer
'She said that John didn't go to Peru any longer.'

- Northern Norwegian - the target dialect of the children in this study - has optional V2 in main *wh*-questions with the monosyllabic *wh*-words *kem* 'who,' *ka* 'what,' *kor* 'where' (cf. Westergaard 2003). As (7) shows the verb also has to follow negation in such contexts:

- (6) Kem {like} han John {like} best?
who {likes} he John {likes} best
 'Who does John like the best?'
- (7) Kem han {*lånte} ikke {lånte} penga til?
who he lent usually not money to
 'Who did he usually lend money to?'
- (8) Koffer {gikk} han {*gikk} hjem så tidlig?
why {went} he {went} home so early
 'Why did he go home so early?'

3. CHILD DATA

3.1 Previous studies on the acquisition of embedded clauses

- Clahsen and Smolka (1986): German-speaking children correctly place the verb clause-finally in embedded clauses already in the very first instances of such clauses.
- Penner (1996): a Swiss-German (Bernese) child correctly places the verb clause-finally in embedded contexts until about the age of 3;2. Then for a period of some months the child produces embedded clauses both with and without verb movement.
- Schönenberger (2001): Swiss German (Lucernese) children overgeneralize verb movement to embedded clauses almost up to the age of 5.
- Occasional incorrect verb movement in German embedded clauses is also reported for German children (Gawlitsek-Maiwald, Tracy, and Fritzenschaft 1992), for Swedish children (Håkansson and Collberg 1994), and for bilingual German-English children (Döpke 1998).

3.2 Data from Young Norwegian Children

- Tromsø corpus: 70 one-hour recordings of 3 Norwegian children, age approx. 1;9-3.¹
- 28 embedded declaratives with negation or an adverb:
 - 12 examples with the order Neg-S-V; the exact position of the verb unclear.
 - 3 examples involve a non-finite verb – also unclear.
 - 4 examples have target-consistent non-V2 word order, see (9).
 - 9 examples display V2 word order, see (10)-(11), 5 of these involve bridge verbs.

- (9) bare når dem **ikke hold** på da dette dem xxx. (Ina, 3;3.18)
only when they not hold.PRES on then fall.PRES they xxx
 'Only when they are not holding on, then they fall.'
- (10) han [//] at han **skjønne ikke**. (Ann, 2;3.9)
he that he understand.PRES not
 'He...that he doesn't understand.'
 Target form: ...at han ikke skjønne.

¹ Apart from ten files that have been recorded and transcribed by one of the authors (Westergaard), the corpus has been collected by Merete Anderssen.

- (11) det er ho mamma som **har** **også tegna.** (Ina, 3;2.05)
it be.PRES DET mommie who have.PRES also draw.PART
 ‘It is mommie who has also been drawing.’
 Target form: Det er ho mamma som også har tegna.

- 1 V3 main clause *wh*-question with negation (overgeneralization of verb movement):

- (12) kem som **vil ikkje være** ilag med han? (Ina, 3;1.08)
who SOM will not be together with him
 ‘Who doesn’t want to be with him?’
 Target form: Kem som ikkje vil være i lag med han?

Table 1: Overview of word order in embedded clauses with Negation/Adverb in the files Ina, Ann and Ole, age approximately 1;9 to 3.

	Neg-S-Vfin	(S)-Vfin-Neg/Adv	S-Neg/Adv-Vfin
Emb. decl.	12	4	4
Emb. decl./bridge verb	0	5	0
V3 <i>wh</i> -question	-	1	0
Total	12	10	4

- 108 embedded questions (all occur with target-consistent non-V2 word order):

- (13) se her ka **Ina gjør.** (Ina, 1;11.22)
look.IMP here what Ina do.PRES
- (14) Ann vet ikke kor **han er** henne. (Ann, 2;2.19)
Ann know.PRES not where he be.PRES LOC
 ‘Ann doesn’t know where he is.’
- (15) skal æ vise # korsen **man trøkke** på knappen? (Ole, 2;10.15)
shall I show..how one push.PRES on button.DEF
 ‘Do you want me to show (you) how you push the button?’

3.3 Investigations of Older Children

- Sporadic recordings and diary notes from two children, Henning (2;4.4 - 8;0.17) and Iver (1;8.10 - 5;9.15).
- Results from a pilot experimental study with the same two children at the ages of 5;9.18 and 8;0.20.
- Verb movement past negation is attested in several non-V2 contexts:

- (16) æ like alt som **er ikke** sterkt og alt som er sterkt. (Henning 4;2.7)
I like everything that is not hot and everything that is hot
 ‘I like everything that isn’t hot, and everything that is hot.’
- (17) æ må ta på ullæsta for at æ **skal ikke** bli så kald. (Iver 4;11.29)
I must take on wool-socks for that I shall not get so cold.
 ‘I need to put on wool socks in order to not get too cold.’
- (18) kem som **var ikke** helt i form? (Henning 4;5.0)
who that was not completely in shape
 ‘Who wasn’t feeling too well?’

- In embedded *wh*-questions, subject-verb inversion is never attested:

- (19) vet du ka **det her er**, tante? (Henning 3;11.12)
know you what this here is auntie
 'Do you know what this is, auntie?'
- (20) æ vet korsn **dem lage** et hus sånn her. (Iver 4;7.10)
I know how they make a house like-that here
 'I know how to make a house in this way.'

• The pilot experimental study elicited embedded *wh*-questions with negation or adverbs. We read the children a story, and afterwards they were asked to question the hippo Hårek to see how much he remembered of it. They had to ask by saying 'Do you remember...?' The setup is illustrated in (21):

- (21) INV: *So, Karsten couldn't go to the kindergarten today, and that was because he was ill. Therefore he couldn't go to the kindergarten. We remember that that was why, but ask Hårek if he remembers why.*
 CHILD: *Do you remember why Karsten didn't go to the kindergarten today?*

• Results:

- The older child placed the verb after negation/adverb in all of 11 his utterances, whereas the younger child placed the verb in front of negation/adverb in 7 out of his 8 utterances:

- (22) huske du koffer han Karsten **ikke var** i barnehagen? (Henning 8;0.20)
remember you why he Karsten not was in kindergarten.DEF
 'Do you remember why Karsten wasn't in the kindergarten?'
- (23) huske du koffer ho **ikke ville** kjøpe den potta?
remember you why she not wanted buy that pot.DEF
 'Do you remember why she didn't want to buy that pot?'
- (24) huske du koffer en mann **ikke fikk** kjøpe Løveungen?
remember you why a man not got buy Lion-baby.DEF
 'Do you remember why a man didn't get to buy the Lion baby?'
- (25) huske du koffer han Karsten **var ikke** i barnehagen? (Iver 5;9.18)
remember you why he Karsten was not in kindergarten.DEF
 'Do you remember why Karsten wasn't in the kindergarten?'
- (26) huske du koffer dama **ville ikke** kjøpe en nattpote?
remember you why lady.DEF wanted not buy a night.pot
 'Do you remember why the lady didn't want to buy a chamber pot?'
- (27) huske du koffer Løveungen **var ikke** til salgs?
remember you why Lion-baby. DEF was not for sale
 'Do you remember why the Lion baby wasn't for sale?'

- Neither of the children ever moved the verb past the subject in any of these embedded *wh*-questions.

4. INPUT

- Samples of the adult material from the Tromsø corpus investigated in detail:

Evidence for V2 extremely frequent (approx. 70%), see Westergaard (2005), similar findings for Swedish in Josefsson (2004).

Evidence for non-V2:

- Embedded clauses with negation or an adverb (Neg/Adv-V):

(28) pass på at den **ikkje faller** over. (INV, file Ole.14)
watch on that it not fall.PRES over
 ‘Watch out so it doesn’t fall over.’ cp. (10)-(11), (16)-(18).

- Main V3 *wh*-questions with negation or an adverb (Neg/Adv-V):

(29) kem som **ikkje får** kjøre? (INV, file Ole.14)
who SOM not get.PRES drive
 ‘Who doesn’t get to drive?’ cp. (12) and (18).

- Embedded *wh*-questions (S-V):

(30) vet du ka slags farge **det er**? (INV, file Ole.14)
know you what kind color that is
 ‘Do you know what color that is?’ cp. (13)-(15), (19)-(20).

Table 2: Overview of the number of certain types of utterances in a sample of child-directed speech, INV in file Ole.14 (N=561, all complete sentences).

CUES for V2		CUES for non-V2		
Questions + topic-initial declaratives	Subject-initial declaratives w/Neg, Adv	Embedded clauses w/Neg, Adv	V3 <i>wh</i> -questions w/Neg, Adv	Embedded (non-subject) <i>wh</i> -questions
337 (60.1%)	43 (7.7% of total, 35% of all subject-init. decl., N=123)	6 (1.1%)	1 (0.2%)	6 (1.1%)

Table 3: Overview of certain utterances providing cues for non-V2 word order in samples of child-directed speech, INV in files Ole.15-Ole.22 (N=6351, all utterances) and MOT in files Ann.01-21 (N=8860, all utterances).

	Embedded clauses w/Neg	V3 <i>wh</i> -questions w/Neg	Embedded (non-subject) <i>wh</i> -questions
INV	32 (0.5%)	0	66 (1.04%)
MOT	39 (0.44%)	41 (0.46%)	224 (2.5%)

- Evidence for non-V2 extremely infrequent.
- Little difference between the two cues for non-V2 (Adv/Neg-V and S-V) with respect to frequency of input.

5. THEORETICAL FRAMEWORK

5.1 The Syntactic Model

- Split-CP clause structure (Westergaard&Vangsnes 2005, Westergaard 2005).

(31) $_{CP} [(Int^\circ Pol^\circ Top^\circ) Foc^\circ [(Wh^\circ) Fin^\circ]]_{IP} [InTop^\circ T^\circ]$

- Not all functional heads need to be present in all clauses; clause typing is dependent on the topmost head in the structure.
- V2 the result of verb movement to different heads in the CP domain – triggered by the feature $[X^\circ_{EPP}]$. Accounts for various V2 grammars, e.g. English vs. Norwegian dialects.
- Embedded declaratives are bare FinPs, embedded questions are bare WhPs. These heads lack the $[X^\circ_{EPP}]$ feature – therefore no verb movement in embedded contexts.

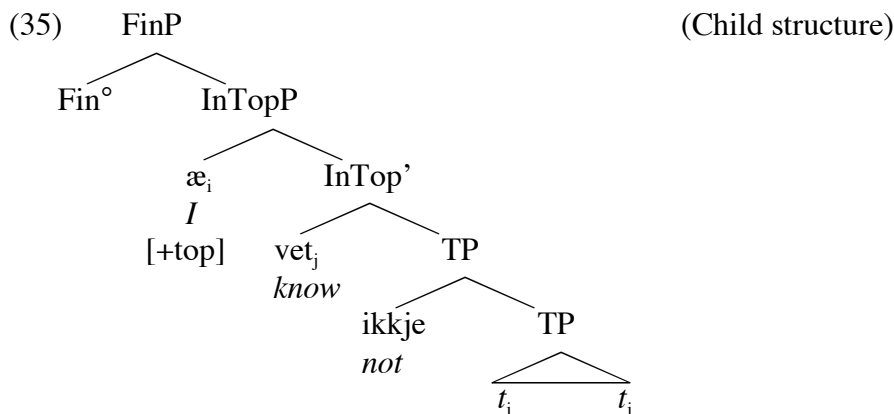
5.2 A Structure-building Approach to Language Acquisition

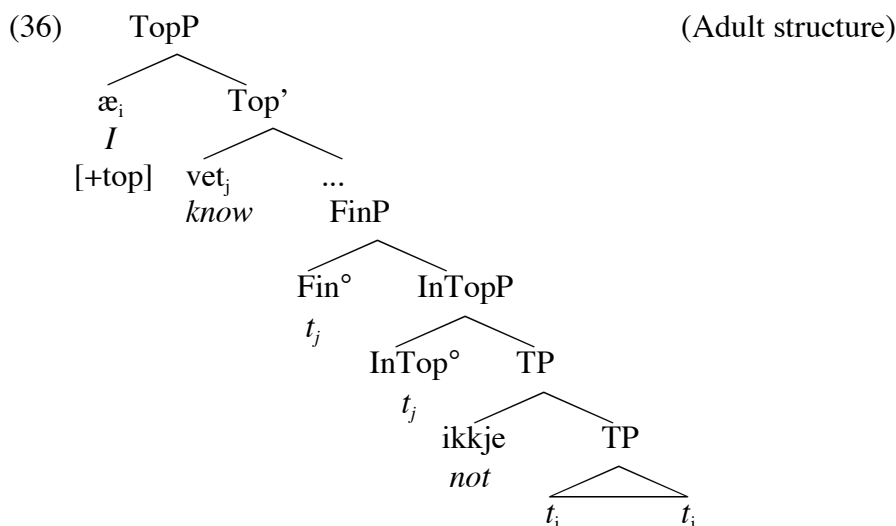
- (32) Children build clause structure based on
- UG (universal “pool” of categories+various rules/constraints)
 - input cues
- (33) Structural economy
- children only build as much structure as there is evidence for in input
 - children only move elements as far as there is evidence for in input

6. ANALYSIS

- In the syntactic model adopted here it is assumed that the verb in all (adult) Norwegian main clauses moves to the highest head, Int° in *wh*-questions, Pol° in *yes/no*-questions and Top° in all declaratives, topicalizations + subject-initial clauses.
- Early verb movement in questions and topicalization constructions is movement to the appropriate heads. That subject-initial declaratives involve the $TopP$ in Norwegian must be learned from input. No clear cues for this in main clauses.
- Still children very early produce target-like finite verbs moved across negation (and other adverbs) in subject-initial main clauses, see (34). Following structural economy, they initially pick a lower head as the target for verb movement in these constructions, the head of the $InTopP$ – the lowest head that ensures V-Neg word order:

(34) æ vet ikkje. (Ann, 1;9.18)
I know.PRES not
 ‘I don’t know.’





- Verb movement to InTop° should also result in non-target V-Neg word order in embedded clauses and V3 *wh*-questions, see e.g. (10) and (18).
- The lack of verb movement across negation/adverbs in embedded clauses (and V3 *wh*-questions) provides the cue that main clause verb movement targets Top°, not InTop°.
- Because of the low frequency of this input cue, children are expected to produce these non-target forms for a considerable time (until the age of 6?).
- Embedded questions lack interrogative force – thus children will not project an IntP in these cases. Therefore no ‘transfer’ of the [X°_{EPP}] feature on Int°, and no overgeneralization of verb movement across the subject from main to embedded questions.
- This is knowledge provided by UG – lack of input is therefore irrelevant in this case.
- **Predictions:**

- (37) *Æ vet ka vil han gjøre. (not predicted)
I know.PRES what will he do
- (38) *Æ vet ka han vil ikkje gjøre. (predicted)
I know.PRES what he will not do

- Children’s choice of an uneconomic word order pattern in embedded clauses (involving verb movement) is caused by an economy principle operative in main clauses, viz the ‘minimalistic approach’ to structure building.

7. SUMMARY AND CONCLUSION

Norwegian children’s early subject-initial clauses display verb movement to a lower functional head than in the target grammar. More specifically, given the economic, structure-building approach to language acquisition assumed here, the child grammar is argued to target the lowest head that will ensure that the verb appears to the left of negation (the head of the InTopP). Support for this analysis is found in certain overgeneralizations of verb movement across negation/adverb in embedded clauses and V3 *wh*-questions. This is relatively persistent in children’s production, due to the low frequency of the crucial input data. The corresponding lack of input cues for word order in embedded questions does not lead to overgeneralization of subject-verb inversion from main to embedded questions. The reason for this is that UG provides a clause structure where main and embedded clauses do not share the same functional architecture.

WORKSHOP ON 'INPUT FREQUENCIES IN LANGUAGE ACQUISITION'

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