Reflexivity, Anti-subject Orientation and Language Acquisition

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0.   Introduction

This paper describes experimental research designed to test the predictions of the "lexical feature acquisition" (LFA) hypothesis of Philip and Coopmans (1996), applied to Norwegian anti-subject oriented pronouns. Philip and Coopmans' hypothesis is that errors in the application of the Chain condition, determined by incomplete lexical acquisition of grammatical features, can be a factor in childrens non-adultlike interpretation of pronouns. We develop an analysis of anti-subject orientation that combines aspects of both Reinhart and Reuland (1993) and Hestvik (1992), which in conjunction with the LFA hypothesis predicts that Norwegian children should perform significantly worse with non-locally bound anti-subject oriented pronouns than with locally bound pronouns (where "locally bound" means bound by a co-argument). Our experimental results support this prediction.

The paper is structured as follows: First we outline the assumptions we are making about binding theory, and what we take to be known about its acquisition, including the LFA hypothesis of Philip and Coopmans (1996). We then show how Norwegian anti-subject oriented pronouns can be analyzed as a Chain condition effect at LF in the adult grammar, and examine the ensuing predictions for Norwegian child language that the LFA hypothesis makes. Finally we discuss the experiment designed to test these predictions.

1.   Binding theory background assumptions

Following the Reinhartian tradition, we assume that the semantic value of a pronoun can be determined in one of two ways: either via syntactic binding (c-command and coindexing) and subsequent logical variable binding, or via a discourse coreference relation, which is not mediated by syntactic indexing. Syntactic binding is governed by two independent (but overlapping) syntactic constraints: the Chain condition, and the Binding Theory, whereas discourse reference is governed by a pragmatic constraint (cf. Chien and Wexler 1990, Grodzinsky and Reinhart 1993).

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The relevant part of Binding Theory here is Principle B, which, in the framework of Reinhart and Reuland (1993), states that *a reflexive predicate must be reflexive-marked*. This constraint rules out (1a,b), since coindexing and variable binding make the verb *like* logically reflexive, yet it fails to be reflexive-marked in its syntactic representation (i.e. none if its arguments nor the verb has reflexive morphology):

(1)   a. *The boy$_1$ doesn't like him$_1$
        b. *Every boy$_1$ likes him$_1$

One essential feature of Reinhart and Reuland's version of Principle B is that it is limited to co-argument relations. The Chain condition, on the other hand, is a general constraint on chains of coindexed elements in A-positions (related by antecedent-government) which requires that the "tail" of the chain be featurally underspecified in some significant respect, i.e., lack full specification of number, gender and case features. This condition blocks coindexing in (2a) below but allows it in (2b), on the assumption that pronouns are fully specified, whereas the reflexive head -*self* is sufficiently underspecified for the reflexive *himself* to be the tail of the A-chain:[2]

(2)   a. *The boy$_1$ can see [him$_1$ dance]
        b. The boy$_1$ can see [himself$_1$ dance]

If antecedent and pronoun are separated by a tensed clause boundary, no A-chain is formed, hence the Chain condition says nothing about the coindexation in (3):

(3)   The boy$_1$ thinks he$_1$ can dance.

The relation between the antecedent and the pronoun in (3) when not coindexed is however governed by a pragmatic constraint on coreference, cf. Chien and Wexler (1990); we here use Grodzinsky and Reinhart's (1993) formulation of this principle (their "Rule I"):

> "NP A cannot corefer with NP B if replacing A with C, C a variable A-bound by B, yields an indistinguishable representation."

To illustrate, consider a non-coindexed representation of the string in (3):

(3')   The boy$_1$ thinks he$_2$ can dance.

Rule I says that representation (3') cannot be interpreted with the subject and pronoun as coreferent via discourse reference, because the coindexed representation (3) of the same string yields an indistinguishable interpretation. The same applies crucially also to (1a) under a contra-indexed analysis. Consider however the discourse in (4):

(4)   Nobody likes this boy. Even the BOY$_1$ doesn't like him$_2$

Here, "the boy" and "him" are not coindexed. According to Rule I, the context that the sentence occurs in allows the two to be interpreted as coreferent, because the coreferent reading is distinguishable from the bound variable reading which would be achieved by coindexing. The latter would express the proposition that even the boy doesn't have the property of self-liking, which is truth-conditionally distinct from the proposition that even

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[2] It remains an open empirical question exactly which grammatical features are relevant to the underspecification in the tail of an A-chain.

the boy doesn't have the property of liking that same boy—the meaning of (4). Hence, coreference is possible in (4) but not in (1a).

Summarizing: coreference via coindexation and c-command (i.e. binding) is regulated by the Binding Theory and the Chain condition, and coreference not mediated by binding (but rather discourse reference) is regulated by Rule I. The next question is: which of these components can be delayed developmentally?

2.   Acquisition assumptions

We assume that there are two different factors causing the appearance of pronominal reference errors in child language. First of all, we adopt the position originally advanced by Chien and Wexler (1990) that the so-called "delay of Principle B," which means that children appear to accept coreference in cases like (1a) at random, is due to a failure to compute the result of the pragmatic constraint on coreference. According to this theory, if the child assigns a syntactic binding representation to the string in (1a), Principle B will rule it out. However, if the child assigns a non-coindexed representation, then Rule I (using Grodzinsky and Reinhart's formulation of the pragmatic principle) must be computed in order to determine if coreference still is possible. The theory is that children fail to do this, and therefore guess whether coreference is possible, which predicts random acceptance rates of corereferent interpretations in strings like *The boy is pointing at him*. Additional evidence for this is that children perform adult-like in cases where only a bound variable representation is possible, as in (5):

(5)   Every boy is pointing at him

The reason is that since the pronoun here cannot corefer with the subject via discourse reference (the subject is quantificational and hence non-referential), Rule I is irrelevant. Coindexation is the only way to get coreference, but then Principle B blocks the representation. Hence coreference is impossible under coindexing or contraindexing.

In addition, Philip and Coopmans (1996) have argued that what they call "Lexical Feature Acquisition Trouble" can be another cause of coreference errors in children. The idea is the following: children have to acquire which lexical features pronouns express (such as person, number, gender and case). If they go through a stage where they analyse, say, a pronoun as not fully specified for all these features in their given language, then the pronoun may appear featurally underspecified to the child's grammatical system, and thus be allowed to be the tail of an A-chain. This will allow variable binding as a source of non-adult coreference interpretation in contexts where Principle B does not apply. To illustrate with an example from Dutch (the child language tested by Philip and Coopmans), consider the sentences in (6a,b):

(6)   a. Het meisje wijst haar aan.
          'The girl points at her'

       b. Het meisje ziet haar touwtje springen
          'The girl sees her jump rope (in a mirror)'

(6a) is a normal delay-of-principle-B context, and indeed, children appear to assign coreferent readings half the time, by hypothesis due to Rule I-failure for a non-coindexed representation. What Philip and Coopman also found, however, was that children made significantly more errors with the sentence type in (6b). Consider below the two possible coindexation patterns for (6b):

(7) a. Het meisje$_1$ ziet [haar$_2$ touwtje springen]
     b. Het meisje$_1$ ziet [haar$_1$ touwtje springen]

In the adult language, (7a) is ruled out by Rule I, and (7b) by the Chain condition. Childrens Rule I failure may "let in" a coreference reading on the basis of (7a). What about (7b)? Philip and Coopman suggest that Dutch children undergo a stage where they have not fully acquired the complete feature specification of the pronoun, and the child grammar consequently analyses *haar* as underspecified. This will allow an A-chain to be formed in (7b), and coreference to obtain via variable binding. Since children therefore can assign coreference both under contraindexing (7a) and under coindexing (7b), there is one more representational choice that leads to coreference in (6b) than in (6a). The explains why children make more non-adultlike coreference assignments in this construction type.

The LFA can be tested where the Chain Condition and Principle B are dissociated, such as for pronouns in ECM subject position. The contribution of the current paper is to show that the LFA can be tested in a novel way in Norwegian, namely by analyzing anti-subject oriented pronouns in this language to be regulated by the Chain condition alone.

3. Norwegian anti-subject oriented pronouns

The pronouns in Norwegian displays the *anti-subject orientation effect* (Hestvik 1992). To illustrate, consider the examples in (8) and (9), where the pronoun cannot be coreferential with the closest subject:
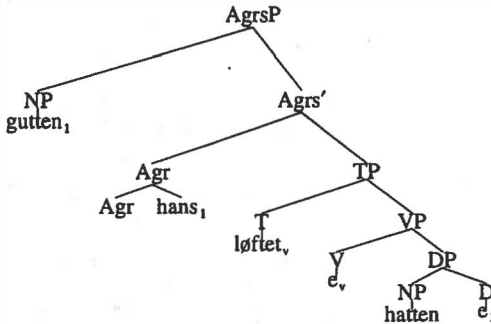
(8) a. *Gutten$_1$ løftet hatten hans$_1$
        'The boy lifted his hat'

     b. Gutten$_1$ viste mannen$_2$ hatten hans$_{2/*1}$
        'The boy showed the man his hat'

(9) *Jenten$_1$ satte stolen bak henne$_1$
     'The girl put the chair behind her'

In (8a), the possessive pronoun cannot corefer with the subject. The same is true in (8b), but here it can refer to the closer indirect object. In (9), the pronoun in the locative PP cannot refer to the subject. This is a non-coreference requirement that is not attributable to Principle B under the Reinhart and Reuland theory, since the effect applies to non-coargument relations. On the basis of surface data, the relation also seems to be unaffected by the Chain condition, since the same constructions with coreference in e.g. English are acceptable (cf. *John likes his mother, John put the chair behind him*).

However, let us assume with Hestvik (1992) that the crucial property distinguishing English and Norwegian pronouns is that the latter undergoes head-movement at LF. In particular, we will assume (following Avrutin 1994) that a pronoun in this type of language will move at LF if and only if it is syntactically bound. The movement is to a functional category in a local relation with the subject. The LF representation for (8a) under coindexation is then (10); similarly for the other cases:

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(10)

```
                        AgrsP
            NP                      Agrs'
         gutten₁
                        Agr              TP
                   Agr    hans₁
                                  T              VP
                               løftet_v
                                          v              DP
                                        e_v        NP          D
                                                 hatten       e₁
```

If we now assume that a subject and a coindexed pronoun in a Spec-Head configuration constitute an A-chain, in other words, that the chain <gutten₁, AgrS-hans₁> is automatically formed in (10), then this LF-representation violates the Chain condition. The consequence is that the only grammatical representation is one where the pronoun is contraindexed with the subject (and consequently not moved at LF). The anti-subject orientation effect is thus derived as an LF Chain condition effect.

4. Predictions for Norwegian child language

Combined with the Philip and Coopman theory of lexical feature acquisition, this analysis of anti-subject orientation makes an immediate prediction for Norwegian child language: if Norwegian children, like Dutch children, undergo a stage where they analyze pronouns as underspecified, then these LFs will *not* violate the Chain condition. In effect, the childrens pronouns will not be anti-subject oriented. If we add the difference between quantificational and non-quantificational antecedents, the predictions for construction type and antecedent type can be summarized as in the table below, along with examples of each sentences type:

	A. Coarguments	B. Non-coarguments
1. Quantificational antecedent	Hver eneste gutt peker på ham 'Every boy is pointing at him' **prediction: NO ERRORS**	Hver eneste gutt løfter hatten hans 'Every boy is lifting his hat' Hver eneste jente satte stolen bak henne 'Every girl put the chair behind her' **prediction: SOME ERRORS**
2. Non-quantificational anteedent	Gutten peker på ham 'The boy is pointing at him' **prediction: SOME ERRORS**	Gutten løfter hatten hans 'The boy is lifting his hat' Jenten satte stolen bak henne 'The girl put the chair behind her' **prediction: MORE ERRORS**

Table I: Predictions

Keeping in mind that the cells are two-dimensional—there are two alternative

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representations for each string, coindexing or non-coindexing—the predictions are: for the sentence type in cell A1 we predict absence of errors, since coindexing is required by the quantificational antecedent (for coreference to obtain); but this is blocked by principle B. Rule I is irrelevant.

For the sentence type in cell A2 the coindexed representation always violates Principle B, but we predict errors due to failure of Rule I with the contraindexed representation.

In cell B1, coindexation is required since the antecedent is quantificational (hence Rule I is irrelevant), but coindexation is here not blocked by the Chain condition if children have underspecified pronouns. Hence, a lack of anti-subject orientation with a quantificational antecedent and a bound variable reading is predicted. Note that as in cell A2, one out of two representations are compatible with coreference: the contraindexed representation in A2, and the coindexed representation in B2. The prediction is then, everything else being equial, that the amount of errors should be the same in A2 and B1.

Finally, in cell B2 there will be the most opportunities for errors: the Chain condition fails to block a coindexed representation (and coreference will be possible), and Rule I fails to block coreference under a contra-indexed representation (and coreference is possible). In other words, in non-coargument binding with a non-quantificational antecedent there is one representation *more* of the string that is compatible with coreference. If experimental conditions are such that the child will choose randomly between a coindexed and a contraindexed representation, the prediction is that he/she should be more likely to assign a non-adult coreference interpretation in cell B2 than in cells A2 and B1.
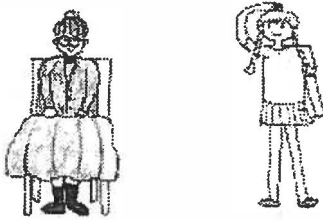
5.   Experiment

These predictions were tested in a truth-value judgment task experiment with around 40 Norwegian children in the age between 4 and 6 years. The experiment was presented to the child as a game with pictures in which one player who could not see the pictures would try to guess what was happening in each picture, while the other players, who could see the picture, gave hints and judged whether or not the guesses were correct. One experimenter played the role of "guesser" throughout the experiment; another experimenter was the "helper" who gave hints; and the child's task was to listen to the guesses, look at the pictures, and judge whether or not the guesses were correct. Adopting a technique of Crain and McKee (1985), the child was also given the job of rewarding the guesser for correct guesses. The materials were counterbalanced in such a way that roughly half the time the guesser made incorrect guesses.

Each experimental item had the following components. The VISUAL INPUT was a single picture showing two people of the same sex but different age-types, one of whom was performing some action, or showing three people of one sex and age-type, each performing some action, and another person of the same sex but a different age-type, doing nothing. The CONTEXT-SETTING INPUT was a verbally presented list of all the objects depicted in the picture, plus mention of the kind of action one or more of them was performing (without identifying agents or patients). The list of discourse referents was first presented by the helper, as "hints" for the guesser, and then mentioned once again by the guesser, in a predetermined order, just before the guess was made. The TARGET INPUT was the guesser's guess. This was delivered as a yes/no question so that it would always be felicitous as a request for information, if not as a guess. Both the helper and the guesser used normal prosody at all times. The DATA consisted in the child's "yes" or "no" responses.

For each of the experimental conditions there were 3 different trials with syntactically identical target inputs but with different types of objects and actions depicted in the visual input and referred to by the target inputs. The general design was similar to that of Chien and Wexler's (1990) 4th experiment. Each experimental item using a pronoun in the target input was counterbalanced by an experimental item using the same predicate but a reflexive in the target input. For example, picture (11a) was presented with a context setting statement that delimits the discourse universe, and then the target input which is the question "is the girl patting her?", as well as with the control question below (control 1):

(11)   *Non-quantificational antecedent / co-arguments (A2):*
        a.

"Hmm, en pike og en bestemor...driver piken og klapper henne? (adult answer: no)
'Hmmm...a girl and a grandma...Is the girl patting her?'

Control 1: *Is the girl patting herself?*   (adult answer: yes)

In addition, each experimental item eliciting an adult affirmative response (correct guess) was counterbalanced by analogous item eliciting an adult negative response (incorrect guess). Picture (11b) illustrates these two control conditions:

b. *Non-quantificational antecedent / co-arguments control (A2):*
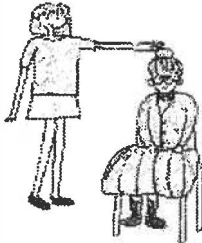

Control 2: *Is the girl patting her?*   (adult answer: yes)
Control 3: *Is the girl patting herself ?* (adult answer: no)

The two other verbs used in condition A2 were "is X drying Y off?" and "is X pointing at Y?". All verbs were repeated in the quantificational version of this condition (i.e., A1); an example picture with experimental input is given in (12):

(12)   *Quantificational antecedent / coarguments (A1):*
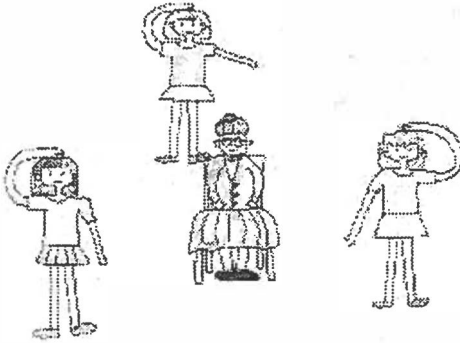
"Hmm, tre piker og en mor...driver hver eneste pike og klapper henne?"
'Hmmm...Three girls and a mom...Is every girl patting her?'

For the non-coargument condition, we used two different syntactic contexts: possessive pronouns, and pronouns in locative PPs. (13a) illustrates possessive pronouns bound by non-quantificational antecedents:

(13)   *Non-quantified antecedent / non-coarguments (B2):*
       a. *Possessive pronouns:*
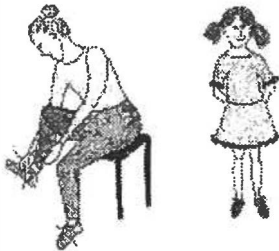
"Hmm, en mor og en liten pike....knytter moren skolissene hennes?"
'Hmmm...a mother and a girl...Is the mother tying her shoe?'

The two other verbs in this condition were "is X lifting his hat?" and "is X holding his pants?" (13b) illustrates a pronoun in a locative PP bound by a non-quantificational antecedent:

b. *Pronoun in locative PP:*

"En gutt og en bestefar... har gutten satt stolen bak ham?"
'A boy and a grandpa...has the boy put the chair behind him?'

The two other verbs in this condition were "did X lay Y behind him/her?", and "did X draw a circle around him/her?"

Finally, (14) illustrates testing of anti-subject oriented pronouns with quantificational antecedents:

(14)   *Quantified antecedent / non-coarguments (B1):*
       a. *Possessive pronouns*

"Holder hver eneste gutt i buksen hans?"
'Hmmm...three boys and a man...Is every boy holding his pants?'

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b. *Pronouns in locative PPs:*

"...tre mødre og en jente...tegner hver eneste mor en sirkel rundt henne?"
'3 moms and a girl...Is every mom drawing a circle around her?'

The test and control items were arranged in a single pseudo-random order, and distributed over two test sessions. The materials were run as two experiments and subject groups, where experiment I tested the conditions in cells A1 and A2 (i.e. co-argument binding), and experiment II tested the condition in cells B1/B2 (i.e. non-coargument binding).

Interspersed with the experimental materials were trials of a screening condition, each eliciting an adult "no" response because the guess was patently wrong. For example, for one trial the guess *Holder gutten en paraply?* 'Is the boy holding an umbrella?' was made about a picture in which nobody was holding an umbrella. Only children who gave a "no" response on 67%-100% of the screening conditions were included in the study (7 children were excluded on this basis, 3 of them were bilingual). The table below gives the age statistics (years-months) for the remaining subjects:

Experiment	n	mean age	age range
I	44	6-3	4-5 to 7-4
II	35	5-10	3-11 to 6-7

Table II

We now turn to the discussion of the results.

6.   Results

Table III gives the results for the control conditions. The percentages indicate percentage adult-like responses (verbal response indicated in parentheses):

	(experiment I)	(experiment II)
	A. Coarguments	B. Non-coarguments

1. Quantificational antecedent	Control 1, e.g., is every girl patting herself? (yes): **99%**
	
	Control 2, e.g., is every girl patting her? (w/different picture) (yes): **98%**
	
	Control 3, e.g., is every girl patting herself? (no): **99%**
		Possessives
		  control 1 (yes): **99%**
		  control 2 (yes): **92%**
		  control 3 (no): **96%**
		
		Locatives
		  control 1 (yes): **99%**
		  control 2 (yes): **93%**
		  control 3 (no): **97%**

2. Non-quantificational antecedent	Control 1, e.g., is every girl patting herself? (yes): **98%**
	
	Control 2, e.g., is every girl patting her? (w/different picture) (yes): **98%**
	
	Control 3, e.g., is every girl patting herself? (no): **99 %**
		Possessives
		  control 1 (yes): **98%**
		  control 2 (yes): **78%**
		  control 3 (no): **87%**
		
		Locatives
		  control 1 (yes): **97%**
		  control 2 (yes): **60%**
		  control 3 (no): **91%**

Table III

As can be seen, the children performed virtually adult-like on all control conditions except for control condition 2 in the non-quantificational non-coargument condition. These are questions like "is the girl tying her shoes" or "did the girl put the box behind her?" where the adult answer is "yes". We will return to this interesting fact in the discussion below; as we will see, this result turns out to support our theory.

There were no significant effects of individual trials and there were no significant effects of age. Because the performance of the five-year-olds on the test conditions was statistically nondistinct from that of the six-year-olds, these two age groups may be collapsed. Table IV below shows the results for the experimental conditions A1 and A2:

age group	n	A1	A2
5 yrs	15	97% (4)	91% (2)
6 yrs	29	99% (4)	90% (1)

Table IV

Table V gives the results for the experimental conditions. Adult response here is always "no"; percentages indicate non-adultlike yes-responses (standard error shown in parentheses). We have replaced the examples sentences from the earlier prediction table with the corresponding question sentences used in the experiments:

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	(experiment I)	(experiment II)
	A. *coarguments*	B. *Non-coarguments*

1.
Quant.
antec.
	Predicted: No errors.
	Observed: **1%** **(1)**
	
	Peker hver eneste gutt på ham?
	'Is every boy pointing at him?'
		Predicted: some errors.
		Observed:
		  Possessives: **21%** **(7)**
		  Har hver eneste gutt løftet hatten hans?
		  'Did every boy lift his hat?'
		
		Locatives: **32%** **(7)**
		Har hver eneste jente satte stolen bak henne?
		'Did every girl put the chair behind her?'

2.
Non-
quant.
antec.
	Predicted: some errors
	Observed: **10%** **(3)**
	
	Peker gutten på ham?
	'Is the boy pointing at him?'
		Predicted: Most errors
		Observed:
		  Possessives: **57%** **(7)**
		  Løfter gutten hatten hans?
		  'Is the boy lifting his hat?'
		
		Locatives: **65%** **(7)**
		Satte jenten stolen bak henne?
		'Did the girl put the chair behind her?'

Table V

7.   Discussion

        As can be seen from cell A1 in the table, the children behaved as predicted with quantificational coargument antecedents: performance here is completely adultlike. Furthermore, as we predicted, there are significantly more non-adultlike yes-responses in the case where both Rule I <u>and</u> the Chain condition may fail to block coreference than in the case where coreference is only possible via Chain condition "errors". T-tests show a highly significant contrast between pronouns in locative PPs bound by quantificational non-coargument antecedents (B1 locative) vs. pronouns in locative PPs bound by <u>non</u>-quantificational non-coargument antecedents (B2 locative) ($p \leq 0.0004$). On the other hand, the contrast between possessive pronouns and pronouns in locative PPs *within* this condition (B2 possessive vs. B2 locative) is not significant ($p \leq 0.1760$). These results suggests that in addition to the general factor that causes coreference errors with contra-indexed representations (i.e. Rule I failure), there must be an independent factor that is responsible for the difference in binder type; our suggestion is that this is the possibility for the child to get coreference via variable binding <u>in addition</u> to Rule I failure in the non-coargument condition.

        The one prediction clearly not borne out concerns co-argument binding relations where the antecedent is non-quantitication (A2). Here, Norwegian children performed virtually adult-like. This is the condition were for example English children are known to perform highly non-adult like. We predicted that Rule I-failure here should lead to roughly the same amount of errors as in condition B1, since one out of two representations of the string can lead to coreference for the child. The results, although not 100% adultlike, nevertheless indicate that there is no Rule I-failure effect in this condition.

        To account for this, we rely on the discovery by McKee (1990) that Italian children show virtually no DPB-effect in similar sentences were clitic pronouns are used. One type of explanation that is emerging for this fact (see e.g. Cardinaletti and Starke 1995) is that since clitics can not be used deictically (i.e. they require a linguistically introduced

discourse antecedent), they can not be used in the kind of contexts where Rule I is designed to <u>allow</u> coreference. If so, Rule I will never be invoked to establish coreference for this type of pronoun, and can therefore also not be given the chance to "fail" in child grammar. If so, non-coindexing a clitic pronoun with its local subject can only lead to non-coreference. If we now consider the analysis of Norwegian pronouns as "LF-clitics", we can then use this idea to suggest that Norwegian pronouns, just like Italian clitics, are not subject to Rule I in their use. This however, would be too general, as it would remove one component of the analysis of the difference between conditions B1 and B2 above. We are therefore left with stipulating, at this point, that Norwegian pronouns are like Italian clitics in this sense only with respect to a co-argument subject, as in condition A2. We leave this as an admittedly *ad hoc* stipulation and guide for future research.

Consider finally the surprisingly low adult-like performance on the two control questions involving non-quantificational non-coargument antecedents where the adults correct response is "Yes", cf. Table IV. An example of a picture and question pair for the possessive in this condition is given in (15a):

(15)   a. *Control 2 for condition cell B2, possessive pronoun:*

"La oss se....en dame og en jente...knytter damen skoen hennes?"
'Let us see....a girl and lady......is the lady tying her shoes?'

In this condition, children surprisingly answered "no" 22% of the time. (15b) illustrates a picture and question pair for pronouns the locative PPs in this condition:

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b. *Control 2 for condition cell B2, pronoun in locative PP:*

"...en jente og en bestemor...jenten har satt bøtta et sted på gulvet...har jenta satt bøtta bak henne?"
'A girl and a grandmother...the girl put the bucket somewhere on the floor...did the girl put the bucket behind her?'

Although the correct answer is obviously "yes" in this condition, children answered "no" 44% of the time.

The explanation for this is the following: although an adult would be pressured by binding theory to assign *the girl* and *the grandmother* respectively as referents for the pronouns in (15a) and (15b), the child's grammar, per hypothesis, allows a coreferent reading via syntactic binding and non-application of the Chain condition. Since the child in the experimental setting clearly have no clue as to the intended referent of the pronoun by the "guesser", he/she is free to assume either a coreferent or a non-coreferent assignment in the interpretation of the question. If a coreferent intepretation is entertained, the answer to the question is of course "no".

In other words, whereas an adult can only assign the LF (16a) to the input string in (15a), the child can also have (16c) as a grammatical representation:

(16) a. adult grammatical LF: [knytter [$_s$ damen$_1$ [$_{VP}$e$_v$ skoene hennes$^{[+F]}_2$]
      b. adult ungrammatical LF: *[knytter [$_s$ damen$_1$ AGR-hennes$^{[+F]}_1$ [$_{VP}$ e$_v$ skoene e$_2$]
      c. child grammatical LF: [knytter [$_s$ damen$_1$ AGR-hennes$^{[-F]}_1$ [$_{VP}$ e$_v$ skoene e$_2$]

With (16c) as the mental representation of the question, the answer is of course "no". Anecdotal evidence for this analysis comes from several instances of recorded spontaneous child productions in this condition, such as the following as an answer to the question in (15a):

(17)   "Nei....skoen til JENTEN!"
        'No.... the GIRLS shoe!'

An adult, on the other hand, would give the same explanation for a "yes" answer.

Another interpretation that lends itself to these data is that children sometimes simply "treat pronouns like reflexives." This would explain the control condition results just discussed, but it would fail to explain the otherwise significant difference between the non-coargument bound pronouns in cells B1 and B2, and the contrasts in general between all the experimental conditions, since a reflexive pronoun is grammatical in all these cases

in Norwegian. If children simply treated pronouns as reflexives, no significant distinctions across conditions would be expected at all.

To conclude: Norwegian, with its anti-subject orientation effect analyzed as being caused by the Chain condition at LF, provides a laboratory for testing the Philip and Coopman hypothesis that incomplete lexical feature acquisition can be an additional source of non-adultlike coreference interpretations in children. The general findings constitute support for the LFA in general and for concluding that Norwegian children have a similar delay in the acquisition of lexical features as observed for Dutch. In addition, anti-subject oriented pronouns constitute a novel case of dissociation between the Chain condition and Principle B, a theoretical distinction which the current research provides experimental evidence for.

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