The Role of Referentiality in the Acquisition of Pronominal Anaphora

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0. Introduction

In this paper we will present experimental acquisition evidence that supports the thesis of Reinhart and Reuland's (1993) "Reflexivity framework" that the feature specification of pronouns which determines their referentiality also has a grammatical and distributional effect in that it interacts with the A-Chain Condition. Within this framework a nominal element that is sufficiently richly specified for ϕ- and Case features cannot be the tail of a well-formed A-chain. Following Reinhart and Reuland, we label such an element "+R". (A nominal element sufficiently underspecified for ϕ- and Case-features such that it can be the tail of an A-chain is labelled "-R".) Our principal acquisition claim is that at a certain age children acquiring Dutch fail to treat *hem* `him' and *haar* `her' as obligatorily +R due to the incomplete lexical acquisition of the feature specification of these pronouns. The result is an unusually strong "delay of Principle B effect" in contexts in which the A-Chain Condition alone regulates the distribution of pronouns. For our analysis we adopt the Strong Continuity position that all principles of UG constraining the interpretation of pronouns are available from the onset of language acquisition. We argue that over and above the nongrammatical factors that contribute to the delay of Principle B effect, a significant additional determinant of this phenomenon in Dutch child language is incomplete lexical acquisition of the ϕ- and Case-feature specification of pronouns. In addition, we will present some new evidence that has bearing on Grodzinsky and Reinhart's (1993) processing account of the delay of Principle B effect.

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1. The Delay of Principle B Effect

A well-established fact about the acquisition of pronominal anaphora is that at a time when young children show virtually fully adult-like comprehension of sentences such as (1a-c), they nonetheless often assign to a sentence such as (1d) a nonadult-like reading in which [*her*] = [*the girl*] (Chien and Wexler 1990; Grimshaw and Rosen 1990; Avrutin and Wexler 1992; Grodzinsky and Reinhart 1993; among others).[1]

(1)	a. *The girl is pointing at herself*	Fully adult-like
	b. *Every girl is pointing at herself*	Fully adult-like
	c. *Every girl is pointing at her*	Fully adult-like
	d. *The girl is pointing at her*	Only 50% adult-like

Children's frequent failure to respect the adult rule of obligatory disjoint reference in contexts such as (1d) has come to be called the "delay of Principle B effect"---henceforth DPBE. The word "delay" is, of course, doubly misleading since (i) from their perfectly adult-like performance with sentences such as (1c) it is clear that children's knowledge---and "obedience"---of Principle B is not delayed in the least, and since (ii) exactly the same pattern of performance represented in (1) is also found with adult agrammatic and Wernicke's aphasics (Grodzinsky et al. 1993; Rosen and Rosen 1995). There are many alternative accounts of the DPBE in the acquisition literature; however, for primarily theoretical reasons,[2] we will adopt the proposal of Grodzinsky and Reinhart (1993)---henceforth G & R. Under this processing account, the DPBE with sentences such as (1d) reflects a difficulty applying an innately-specified extra-syntactic constraint on disjoint reference---i.e. G & R's "Rule I", given in (2c). Due to limitations on working memory, the child is unable to apply Rule I. Consequently, although always assigning to a sentence such as (1d) the grammatical LF shown in (2b)---and never the ungrammatical one in (2a)---, the child is unable to determine that counter-indexed NP_J and NP_K must be obligatorily disjoint in reference. Instead, adopting a "guessing" strategy for deciding the issue, the child often allows NP_J and NP_K to have the same denotation. For a group of such children roughly 50% of the responses with input such as (1d) will be nonadult-like. As for the highly adult-like performance that the same children will show with sentences such as (1c), this is explained by the fact that Rule I only regulates coreference relations. Since the relation between a universal quantifier and the pronoun bound by it is not one of coreference, Rule I does not have an opportunity to break down in the case of sentences such as (1c)---but see Heim (1993). Finally, note that G & R also predict for children who show a DPBE with sentences such as (1d) a "Delay of Principle C Effect" for

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[1] In Chien and Wexler's (1990) study, for example, a group of 44 children between five and six years old accepted nonadult-like coreference readings with sentences such as (1d) as often as 51% of the time, but accepted nonadult-like bound variable readings with sentences such as (1c) only 16% of the time.

[2] Although the objections of Rosen and Rosen (1995) and Heim (1993) indicate the need for some significant modifications, Grodzinsky and Reinhart's processing proposal still appears to us to be the best explanation of the DPBE on the market. First, it adopts a Strong Continuity position. Second, it relates the DPBE observed in children's and adult aphasics' linguistic performance to much discussed, and in our view clearly related, phenomena in normal adult linguistic performance---i.e. the fact that in certain contexts normal adults also regularly violate Principle B, e.g. *You don't hate me; you hate you* meaning "You don't hate me; you hate yourself" (spoken at one point by Sean Connery to Meg Ryan in the film "The Presidio").

sentences such as (2d). This is because in G & R's view it is Rule I, not Condition C, which requires that NP_J and NP_K in (2d) be disjoint in reference in the adult grammar.

(2) a. *[The girl$_J$ is pointing at her$_J$] Principle B violated

b. [The girl$_J$ is pointing at her$_K$] Principle B satisfied

c. Rule I: NP α cannot corefer with NP β if replacing α with γ, γ A-bound by β, yields an indistinguishable interpretation

d. [Above the boy$_J$ he$_K$ is holding an umbrella]

2. An Unexpected Lexical Factor in the DPBE in Dutch

An apparent problem for G & R's processing account of the DPBE—and also potentially for our Strong Continuity assumption concerning Principle B---is the fact that the DPBE varies considerably in strength across child languages, suggesting that the phenomenon requires grammatical rather than a processing-theoretical explanation. Italian preschoolers, for example, do not seem to have any DPBE at all (McKee 1992). Dutch children, on the other hand, are reported to show a much stronger DPBE than is generally found with English children (Koster 1993). While G & R's proposal can accommodate the facts for Italian child language fairly straightforwardly,[3] the observation in Dutch child language of a DPBE that occurs more often than 50% of the time is at first blush rather problematic.

Recent research in Dutch offers a solution to this problem, however. Sigurjónsdóttir and Coopmans (1996) report that the DPBE occurs significantly more often with sentences such as (3b) than with sentences such as (3a). The difference between these two sentences is that the embedded verb of (3b) has a homophonous cousin in the lexicon that is inherently reflexive (+Refl) in the sense of Everaert (1986)---namely *zich wassen* 'wash oneself'---while the embedded verb of (3a) does not. (Sigurjónsdóttir and Coopmans' principal findings are shown on the right in (3a-b).) Working in the Binding-theoretical framework of Reinhart and Reuland (1993---henceforth R & R---, Sigurjónsdóttir and Coopmans argue that incomplete acquisition of the lexical features of the pronoun gives rise to this effect. Given the acquisition hypothesis in (3c), the high levels of DPBE observed with sentences such as (3b) can be attributed to the circumstance that some of the time the child assigns to the embedded clause the LF in (3g) rather than the LF in (3f). The LF in (3g) would be ill-formed in the adult grammar because for adults *hem* can only be +R. Given (3c), however, *hem* is optionally able to be -R in the child's grammar. If the child takes *hem* to be -R, then it can be the tail of a well-formed A-chain, on a par with the well-formed adult LF in (3h). As for Dutch children's performance with sentences such as (3a), the usual levels of DPBE that are observed here are explained in the usual fashion: the well-formed LF in (3e) is assigned---never the ungrammatical one in (3d)---and then Rule I breaks down and counter-indexed NPs are

[3] Syntactic pronominal clitics differ from full pronominals in that they must be treated as heads at some level of representation, as a result of which they are subject to additional constraints. Arguably, this categorial distinction is responsible for the absence of a DPBE in Italian child language.

interpreted coreferentially 50% of the time on average.

(3) a. *Jan wilde dat Ad hem aaide* — 50% of responses: [*hem*] = [*Ad*]
'Jan wanted that Ad pat him'

b. *Jan wilde dat Ad hem waste* — 80% of responses: [*hem*] = [*Ad*]
'Jan wanted that Ad wash him'

c. Acquisition Hypothesis: Dutch children have trouble identifying *hem* as +R.

d. *[Ad_J aaide hem_J] — Principle B violated; Chain Condition satisfied
-Refl -R

e. [Ad_J aaide hem_K] — Principle B satisfied; Rule I breaks down
-Refl -R

f. [Ad_J waste hem_K] — Principle B satisfied; Rule I breaks down
-Refl -R

g. [Ad_J waste hem_J] — Principle B satisfied; Chain Condition satisfied
+Refl -R

h. [Ad_J waste $zich_J$] — Principle B satisfied; Chain Condition satisfied
+Refl -R

3. The Experiment

The first goal of the experiment was to replicate Sigurjónsdóttir and Coopmans' findings using a different experimental paradigm and a different syntactic context. Given the R & R framework, if the acquisition hypothesis in (3c) is valid, then the DPBE in Dutch child language should be much stronger in the verbal small context in (4a) than in the context of (1d) or (3a). This is because, just as with the hypothesized child LF in (3g), the hypothesized child LF in (4c) is well-formed both with respect to Principle B and the A-Chain Condition in the R & R framework. For adults, in contrast, *haar* cannot be bound by *het meisje*, as in (4b), due to a violation of the A-Chain Condition.

The second goal was to test G & R's prediction that a "delay of Principle C effect" will parallel the DPBE. According to G & R, on average children will show 50% adult-like performance both with sentences such as (1d) and with sentences such as (2d). The predictions being tested, then, are summarized in table (4d).

(4) a. *Het meisje ziet haar touwtje springen*
'The girl sees her jump-rope'

b. *[Het meisje$_j$ ziet [haar$_j$ touwtje springen]] — Principle B satisfied; Chain Condition violated
+R

c. [Het meisje$_j$ ziet [haar$_j$ touwtje springen]] — Principle B satisfied; Chain Condition satisfied
-R

d.

target linguistic input	Prediction
De moeder wijst haar aan 'The mother is pointing at her'	50% adult-like
Het meisje ziet haar touwtje springen 'The girl sees her jump-rope'	0% adult-like
De jongen ziet hem bellen blazen 'The boy sees him blow bubbles'	0% adult-like
Boven de jongen houdt hij een paraplu 'Above the boy he holds an umbrella'	50% adult-like

3.1 Subjects

The age statistics of the 93 monolingual Dutch-speaking children who participated in the study are given in table (5). Since no significant age effects were observed for the four-, five- and six-year-olds, these three age groups have been collapsed. In addition, 17 adults participated as a control group.

(5)

group	included	age range	mean age	excluded
4-6 yrs	58	3-9 to 6-11	5-9	7
7 yrs	22	7-0 to 7-11	7-6	0
8 yrs	13	8-0 to 8-11	8-7	0

3.2 Procedure, Design and Materials

The experimental paradigm was essentially that of Chien and Wexler's (1990) 4th experiment. The experimental task was to answer a yes/no question asked about a picture. At each trial of an experimental condition, a picture was held up so that the child could see it but the experimenter asking the questions could not. (Hiding the picture from the questioner made the question felicitous as a request for information.) Another experimenter, sitting with the child, then made a "context-setting statement" by mentioning in a thematically neutral fashion the two types of objects shown in the picture. Immediately after the reading of the context-setting statement, the experimenter who could not see the picture asked the yes/no question with the

target input. Normal prosody was used at all times.

There were 2 different trials each of 4 test conditions and of 13 control conditions. Including 8 filler items, there was a total of 42 experimental items, presented in a single pseudo-random (maximally varied) order, each item consisting of a 21 x 29 cm color picture about which a yes/no question was asked. As in Chien and Wexler's (1990) 4th experiment, the materials were counterbalanced as to whether a pronoun or a reflexive was used in the target input, and as to whether the expected adult response was "yes" or "no". For each trial of a test or control condition there were always just two types of possible discourse antecedents, both clearly of the same sex. The control conditions, which are represented in English in (6), used the predicates *aanwijzen* 'point at' and *vastpakken* 'hold', the determiner universal quantifier *iedere* 'every/each/any', the pronoun *haar* 'her' and the reflexive *zichzelf* 'herself/himself'.

(6) Control Conditions

target input	picture-type	adult response	name
Is the girl pointing at her?	nonreflexive	yes	CTRL1
Is the girl pointing at herself?	reflexive	yes	CTRL2
Is the girl pointing at herself?	nonreflexive	no	CTRL3
Is every girl pointing at her?	reflexive	no	CTRL4
Is every girl pointing at her?	nonreflexive	yes	CTRL5
Is every girl pointing at herself?	reflexive	yes	CTRL6
Is every girl pointing at herself?	nonreflexive	no	CTRL7
Does the girl see her dance?	nonreflexive	yes	CTRL8
Does the girl see herself dance?	reflexive	yes	CTRL9
Does the girl see herself dance?	nonreflexive	no	CTRL10
Is every girl pointing at a boy?	nonreflexive	yes	CTRL12
Is every girl pointing at a boy?	nonreflexive	no	CTRL12
(same as RULE I test condition)	nonreflexive	yes	CTRL13

The test conditions are exemplified in English in (8); the Dutch target input for (8) is given in (7). Note that for the test conditions the picture-type is always reflexive and the adult response is always "no". The embedded predicates for the other trials of VSCher and VSChim were *dansen* 'dance' and *een vlag zwaaien* 'wave a flag', respectively.

(7) a. SIMPLE: *Wijst de moeder haar aan?*

b. VSCher: *Ziet het meisje haar touwtje springen?*

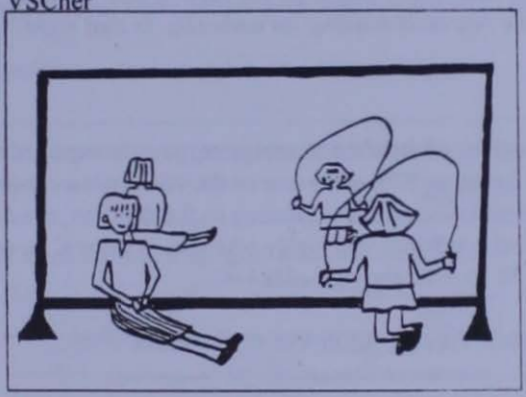
c. VSChim: *Ziet de jongen hem bellen blazen?*

d. RULE I: *Boven de jongen houdt hij een paraplu. Klopt dat?*

(8) a SIMPLE

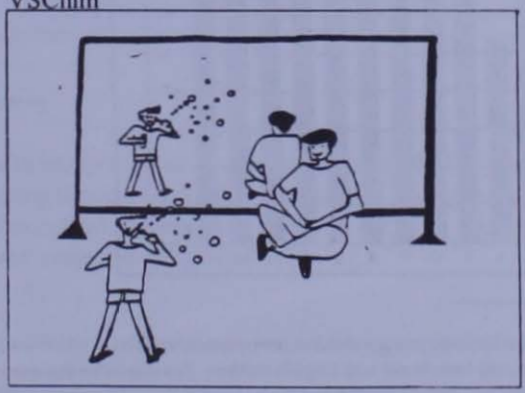
Here you have a mom and here you have a girl. (context)
Is the mom pointing at her? (target input)

b VSCher



Here you have a real big mirror...
and here you have a girl and here you have a mom. (context)
Does the girl see her jump-rope? (target input)

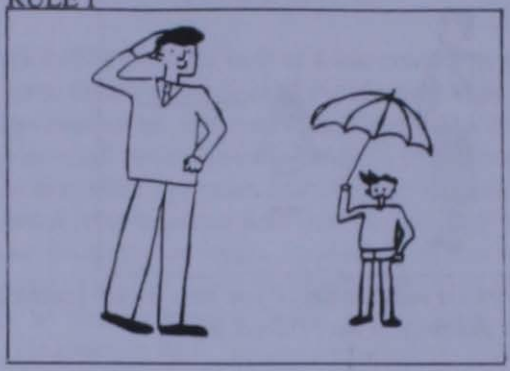
c. VSChim



Here you have a real big mirror...
and here you have a boy and here you have a dad. (context)
Does the boy see him blow bubbles? (target input)

(8) continued

d. RULE 1



Here you have a boy and here you have a dad. (context)
Above the boy he is holding an umbrella. Is that right? (target input)

3.3 Results

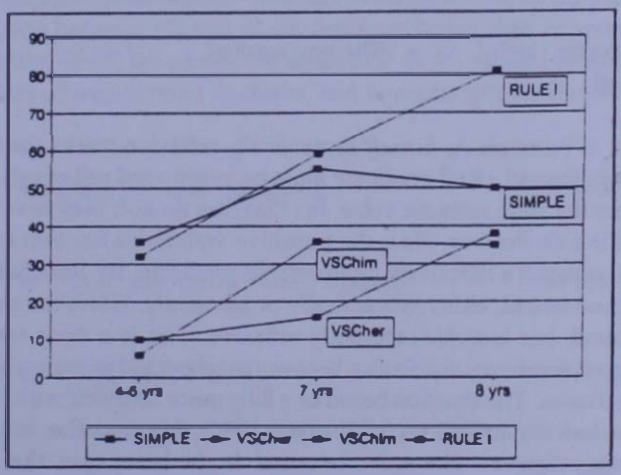
The 17 Dutch-speaking adults of the control group gave the expected responses 94% of the time for the SIMPLE test condition, 97% of the time on the VSChim test condition, and 100% of the time for all other experimental conditions. Turning to the children, the first finding was that performance on the control conditions was highly adult-like in general, as exemplified in (9) by the performance of the 58 four-to-six-year-olds.[4]

(9) Control Conditions: Percent Adult-like Performance

[4] It may be observed that for these younger children performance on CTRL4, which tested sentences such as (1c), was less adult-like than has generally been found with English children. The reason for this seems to concern the fact that Dutch *iedere* can also have the same meaning as English free choice *any* (Philip and Coopmans 1996b). Nonetheless, for the four-to-six-year-olds performance on the CTRL4 condition was still significantly more adult-like than performance on the SIMPLE condition (sign test; $p \leq 0.0030$).

Turning to the test conditions, as seen in (10), performance under the SIMPLE condition was adult-like roughly 50% of the time across all ages, as expected.[5] The first new finding of interest is that the levels of adult-like performance under the RULE I condition was nondistinct from that observed under the SIMPLE condition for all children under the age of eight years. The contrast between SIMPLE and RULE I for the eight-year-olds was marginally significant, however (sign test, $p \leq 0.0391$). A second interesting finding is that levels of adult-like performance under the VSCher and VSChim conditions were extremely low for the younger children. The contrasts between the SIMPLE and the VSCher conditions are highly significant both for the four-to-six-year-olds and for the seven-year-olds (sign tests, $p \leq 0.0000$ and $p \leq 0.0003$, respectively). The third interesting finding is that, quite unexpectedly, levels of adult-like performance under the VSCher and VSChim conditions contrasted marginally significantly for the seven-year-olds (sign test, $p \leq 0.0391$). This seems to indicate that there was a developmental change around the age of seven years that affected only the pronoun *hem* 'haar'---i.e. there was a sharp improvement in performance in the verbal small clause with *hem* but not with *haar*.

(10) Test Conditions: Percent Adult-like Performance



4. Discussion

In order to interpret these results in terms of the R & R model, we will begin this section by briefly illustrating the operation of the two Binding Principles in that framework, adding some details to the theoretical discussion in sections 1-2. The necessary ingredients are given in (11), the relevant examples are given in (12a-d).

[5] The performance of the four-to-six-year-olds under this condition was adult-like only 36% of the time, however. This is significantly lower than is usually observed for children of this age, at least in English. This seems to be due to the fact that indefinite and definite descriptions such as *a girl* and *the mother* were used in the linguistic input, rather than proper names such as *Goldilocks* (for discussion, see Philip and Coopmans 1996b).

(11) Reinhart and Reuland's (1993) Binding Theory

Principle A: A reflexive-marked syntactic predicate must be interpreted reflexively
Principle B: A reflexively interpreted predicate must be reflexive-marked

* English *-self* and Dutch *-zelf* = syntactic reflexive-markers
* certain verbs are inherently reflexive (e.g. *zich schamen* 'be ashamed')

(12) a. *[The boy$_J$ tickled herself$_K$] Violation of Principle A
+Refl

b. *[The boy$_J$ tickled him$_J$] Violation of Principle B
-Refl

c. [De jongen$_J$ waste zichzelf$_J$] 'The boy washed himself'
+Refl

d. [De jongen$_J$ waste zich$_J$] 'The boy washed'
+Refl

(12a) is a violation of Principle A; *herself* syntactically reflexive-marks the predicate *tickle*. As a result, this newly formed +Refl predicate must be interpreted reflexively. That is, its co-arguments must share the same syntactic value. In (12a) they do not; they have different indices. (12b) is ill-formed in a similar way. Here the transitive verb *tickle* has two arguments which are coindexed. That makes it a reflexively interpretable predicate. By Principle B, such a predicate must be reflexive-marked, either syntactically or inherently. However, there is no syntactic reflexivizer around, nor is *tickle* inherently reflexive. This is a fairly transparent way in which the standard complementary distribution between anaphors and pronouns is captured in a theory of reflexive predicates. The situation becomes a little more complex with verbs like *wassen* in Dutch, which are lexically ambiguous (cf. Everaert 1986); they can either be transitive---like *tickle*---or inherently reflexive---like *to be ashamed*. In the latter case, they take the bare anaphor *zich*. (12c) is a well-formed representation with a reflexive-marked predicate---induced by *zichzelf*---taking two coindexed arguments, hence satisfying Principle A. (12d) satisfies Principle B on the inherently reflexive version of *wassen*. It has two coindexed arguments, which require a reflexively-marked predicate. That requirement is met if *wassen* in this example is inherently +Refl.

The explanation of (12d) reflects an important difference between the scope of Principle B in the standard Binding Theory and the scope of its counterpart in the R & R model. Suppose that *zich* in (12d) were replaced by *hem*. That would certainly lead to a violation of the standard Binding Principle on pronominals---an empirically correct result. Yet, in the R & R model, Principle B would be satisfied by virtue of the fact that the predicate is inherently reflexive-marked. In fact, for the purposes of the Binding Theory it is irrelevant in this case what exactly occupies the object position. As long as the two coarguments of the predicate are coindexed, there is a way of meeting the requirement of Principle B. So, in the R & R model, what is responsible,

then, for the ungrammaticality of [De jongen$_K$ waste hem$_K$] using the +Refl version of *wassen*?

R & R argue that the explanation must lie in the operation of the independently motivated Condition on A-chains, such as formulated in (13).

(13) A-Chain Condition

A maximal A-chain ($\delta_1,\ldots,\delta_n$) contains exactly one link---δ_1---
that carries a full specification for ϕ-features and structural Case.

This condition informally states that the tail of an A-Chain must be 'referentially defective'---this is what we have represented as -R. Elements which are -R are the reflexive-markers *himself* and *zichzelf* in English and Dutch, respectively, as well as the Dutch bare anaphor *zich*. None of these elements can independently pick out an element from the discourse. In order to be able to refer, they are dependent on a syntactic antecedent. The pronouns *him/her; hem/haar* in the contexts discussed here, on the other hand, are +R---they are fully specified for ϕ-features and are structurally Case-marked---and cannot be dependent on an antecedent in an A-chain. This distinction between +R and -R elements can be invoked to account for certain grammatical possibilities which are outside the scope of R & R's revised binding theory. (14) contains two examples of well-formed A-chains, and two examples of ill-formed ones.

(14) a. [Jan$_J$ kietelde zichzelf$_J$] 'John tickled himself'
-R

b. [Jan$_J$ zag [zich$_J$ bellen blazen]] 'John saw himself blow bubbles'
-R

c. *[Jan$_J$ waste hem$_J$] 'John washed him'
+R

d. *[Jan$_J$ zag [hem$_J$ bellen blazen]] 'John saw him blow bubbles'
+R

In (14a) the tail of the A-chain headed by *Jan* is the -R element *zichzelf*, the chain contains precisely one +R element, i.e. the head. (14b) is also well-formed; the -R element *zich* occupies the subject position of a verbal small clause complement and can form an A-chain with the +R matrix subject. (14c) is ill-formed because a chain relation between the subject and the object is blocked since both elements are +R. This construction will always be ruled out regardless of whether or not the predicate is inherently reflexive. (14d), too, is ill-formed because an A-chain relating a +R matrix subject to a +R complement subject violates the Chain Condition in (13).

The one and only factor that distinguishes the well-formed (14b) from the ill-formed (14d) is the +/-R status of the small clause subject. The explanation revolves around the operation of the A-Chain Condition. Contrary to the standard view, R & R's Binding Theory---in particular

Principle B---has nothing to say about the grammatical options of having a pronoun in the subject position of a verbal small clause. This is because the scope of Principle B is restricted to co-arguments of a single predicate, and does not extend to subjects of different predicates. We can thus conclude that (14d) displays a pure Chain Condition effect. The same answer can be given to the question raised earlier as to why [Jan$_K$ waste hem$_K$] on an inherently reflexive reading of *wassen* is ungrammatical. The construction satisfies Principle B but violates the Chain Condition. Like (14d), it allows one to isolate a pure Chain Condition effect.

A similar observation played a role in the account of Sigurjónsdóttir and Coopmans (1996). As was noted in section 2, Sigurjónsdóttir and Coopmans found that children performed differently on *Ad waste hem* than on *Ad aaide hem*. The difference lies in the fact that the former example can in principle be analyzed using the inherent reflexive variant of *wassen*, in which case Principle B is satisfied. That option does not exist with *aaien*-type verbs, where the corresponding example will always be a Principle B violation. Children's poorer performance on the *wassen*-type examples can then be related to the operation of the Chain Condition. If this condition somehow fails to rule out the local relationship between the subject and the object, then, on the reflexive variant of *wassen*, *Ad waste hem* is incorrectly ruled in, while *Ad aaide hem* remains a violation of Principle B. Hence, the source of the discrepancy must lie in the Chain Condition.

For purposes of clarification, the abstract representations underlying the SIMPLE and VSC test conditions are once more given in (15a) and (15b), respectively. Experimental results that show children's nonadult-like performance under the VSC conditions to be worse than their performance under the SIMPLE condition will crucially point to a divergence from the adult grammar with respect to the way in which certain lexical elements are subject to the Chain condition.

(15) a. *[NP$_J$ V-Refl haar$_J$] Violation of Principle B and Chain Condition

b. *[NP$_J$ V [haar$_J$ .. V]] Violation of Chain Condition

The experiment that we have carried out shows that there is a clear contrast between Dutch children's performance on the SIMPLE condition and their performance on the VSCher condition. In their LF for (15b) the Chain Condition is satisfied, contrary to what is possible in the adult grammar. We have thus found additional support for Sigurjónsdóttir and Coopmans' hypothesis that Dutch children can treat pronominals as -R elements, allowing them to enter into A-chain relations. Before discussing why Dutch children can in fact take pronominals as -R, we would like to point out that their poorer performance on the VSCher condition cannot be explained through some general cognitive difficulty understanding questions about whether or not someone else can see themselves in a mirror. We may simply note that the children performed very well on the control conditions, including both reflexive and nonreflexive versions of the VSCher condition.

Nor can the children's performance under the VSC conditions be attributed to some grammatical difficulty with perception complements. We know independently that children know these syntactic structures since verbal small clause complements are produced at an early age, as is illustrated in (16).

(16) a. *'K hoor grote aankomen* 'I hear big one coming' [Hein 2;6.10]

b. *Ik ziet een kussen liggen* 'I see a pillow lying (somewhere)' [Sarah 2;8.19]

Thus, we are faced with the following problem: What allows Dutch children to treat pronominals as -R. Given the definition of the Chain Condition in (13), we can more precisely formulate this question as in (17).

(17) Which property—ϕ-feature or structural Case—is un(der)specified on pronouns in Dutch child grammar?

In order to answer this question, we also have to take into account a second significant contrast that we found: At the age of seven years, Dutch children performed better under the VSChim condition than under the VSCher condition, a contrast that disappeared at the age of eight years. Very generally speaking, it took them about a year longer to figure out that *haar* is as much an obligatorily +R element as *hem*. This second finding, along with some other considerations, suggests that what is involved is the specification of Case.[6] Consider the pronoun paradigms in (18).

(18)

nom	*hij*	*zij*
gen	*zijn*	*haar*
dat	*hem*	*haar*
acc	*hem*	*haar*

The child is faced with the problem of figuring out which of these are structural Case forms. For the purposes of our discussion, we can restrict our attention to the *hem/haar* forms. With regard to *hem* the child needs to determine whether its Case is assigned structurally or not. This is where the problem begins. Both the dative and accusative forms of the masculine paradigm are *hem*, but despite their homophony these Case forms arise by different mechanisms. Datives in Dutch have been standardly analyzed as inherent Case forms. This is shown by the fact that indirect objects cannot be passivized in Dutch, while direct objects can, as exemplified in (19). If passivization absorbs structural Case, but not inherent Case (cf. Chomsky 1981), we can account for the fact that in Dutch the object of *arresteren* can be passivized, while the secondary object of *geven* cannot.

(19) a. *Hij/zij werd gearresteerd* 'He/she was arrested'

b. **Hij/zij werd twee boeken gegeven* 'He/she was given two books'

There is no clearcut evidence for the Dutch child to analyze *hem* in the relevant test constructions as a form of structural Case. She has no grounds, therefore, for supposing that *hem* could not be

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[6] Among these considerations is a finding from another study that English-speaking children tested on the VSCher condition do not seem to show such low levels of adult-like performance as their Dutch counterparts, which appears to be related to a Case difference between these two languages (Philip and Coopmans 1996a).

-R. It is our contention that the fact that structural Case and non-structural Case in the Dutch pronominal system are overtly indistinguishable is what keeps the child from drawing any firm conclusions about structural Case forms, and that is why she is doing so poorly under the VSChim condition.

When we turn to *haar*, we find that this element is even more troublesome. The explanation in terms of Case now becomes straightforward. The indeterminacy in this paradigm is even greater. There are three Case instances of *haar*, one of which is structural, two of which are non-structural. (Following Chomsky 1986, we assume that genitive Case is an inherent case.) The *hem* paradigm shows a slightly greater variety of forms and therefore less indeterminacy. This distinction is responsible, we propose, for the time lag that is observed in Dutch children's identification of *hem* and *haar* as obligatorily +R elements.

The Case-based explanation that we are proposing here finds an analog in the analysis of the same small clause construction in Frisian, presented in (20), which is grammatical in the adult grammar.

(20) [Marie$_j$ hearde [har$_j$ sjongen]]
'Mary heard her sing'

There is independent evidence that Frisian *har* can be a form of non-structural Case (cf. Reinhart and Reuland 1993). It is precisely this property that allows it to be a tail of a well-formed chain in such constructions as in (20). Our analysis of the way Dutch children interpret these constructions, which we have argued is due to their incomplete lexical acquisition of the Case specification of pronouns, simply says that as far as this domain of grammar is concerned, Dutch children speak a dialect of Frisian.

5. Conclusion

Adopting the R & R framework, what we have shown is that the strong DPBE in Dutch child language can be explained as arising from a combination of two factors: (i) a basic processing difficulty concerning coreference and (ii) an interactive effect of the lexical acquisition of pronominal feature specification with the Chain Condition. Finally we note that we have also uncovered a new finding that has bearing on Grodzinsky and Reinhart's processing account of the basic DPBE. The levels of adult-like performance under the SIMPLE and the RULE I conditions were nondistinct for all children in the study under the age of eight years, just as predicted by G & R. On the other hand, for the eight-year-olds performance on the two conditions did differ significantly. To our knowledge, these are new findings that merit further research.

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