All Pronouns Are Not Acquired Equally in Dutch: Elicitation of Object and Quantitative Pronouns

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1. Introduction

Despite the large number of studies on Dutch children's pronoun interpretation, relatively little is known about their production. In this study, we elicited pronouns in two syntactic environments: direct object pronouns and quantitative *er*. The goal was to investigate if the two different types of pronouns are acquired equally, or whether acquisition is sensitive to their different syntactic properties.

The investigation is part of a large cross-linguistic project: COST Action 33.[1] Object pronouns have been investigated along with object clitics in 17 COST languages (Varlokosta et al., in prep.). Quantitative *er* (Q-*er*) is a so-called partitive pronoun; it is unique among the Germanic languages, but has the same syntactic function as partitive clitics in Romance. Q-*er* was tested along with partitive clitics in three Romance languages (*en* in French, *ne* in Italian, and *en/ne* in Catalan) (Gavarró et al., in prep.). Dutch is the only language of these four in which the partitive word is a pronoun rather than a clitic. In this paper we present the Dutch results of these two COST tasks. We refer to Varlokosta et al. (in prep.) and Gavarró et al. (in prep.) for the cross-language comparisons for each task.[2]

Do children supply an object pronoun or Q-*er* in contexts where objects are obligatory, or do they leave it out? The literature on Dutch pronoun acquisition focuses largely on children's comprehension of pronouns (and reflexives). There are no studies on children's use of Dutch Q-*er*.[3] Pronoun production studies are rare. We review the three object pronoun studies, focusing on the question of omission.

Spenader, Smits, and Hendriks (2009) elicited object pronouns in relation to Binding Theory issues. Preschoolers (between the ages of 4;5 and 6;6, roughly the same age as the 5-year-olds in the present study) hardly made any mistakes, appropriately supplying an object pronoun or full NP in the

[*] This work is part of a larger study on partitive clitics and pronouns as developed in Gavarró et al. (in prep.) and object pronouns (Varlokosta et al., in prep.). We thank Bart Hollebrandse and Jan-Wouter Zwart for helpful discussions, as well as the audiences at the COST A33 Final Conference *Let the children speak*, London (2010), the *TiN dag* at Utrecht University (2010), the *GALANA 4* conference at the University of Toronto (2010), and the Acquisition Lab at the University of Groningen (2010). We thank three anonymous reviewers for helpful comments on an earlier draft of this paper.

[1] The EU-funded COST A33 project is called *Crosslinguistically Robust Stages of Children's Linguistic Performance, with Applications to the Diagnosis of Specific Language Impairment* (P.I. U. Sauerland, 2006-2010). The goal is to provide a cross-linguistically uniform picture of 5-year-olds' knowledge of grammar, which can serve as the basis for further research into clinical markers for the detection of SLI. Twenty-eight languages are studied by researchers from twenty-five different countries. The COST research themes include pronouns, quantification, implicatures, passives, tense and aspect, and questions.
http://www.zas.gwz-berlin.de/index.php?id=47&L=1

[2] The object clitic/pronoun elicitation experiment was designed and developed by Spyridoula Varlokosta, João Costa, and others in the COST A33 Pronoun group. The quantitative *er* experiment was designed and developed by Anna Gavarró, Laurie Tuller, and Maria Teresa Guasti.

[3] With the exception of an Utrecht University unpublished MA thesis by Laverman (2003), which we have not been able to trace unfortunately.

 Selected Proceedings of the 4th Conference on Generative Approaches to Language Acquisition North America (GALANA 2010), ed. Mihaela Pirvulescu et al., 106-121. Somerville, MA: Cascadilla Proceedings Project.

disjoint-reference condition and a reflexive in the co-referential condition. The authors do not report any cases of object pronoun omission. Analyzing one young Dutch child's spontaneous speech between the ages of 2;4 and 2;7, however, Schaeffer (2000) reports frequent cases of pronoun omission. On the other hand, Schaeffer finds no omission in the utterances of two, three and four-year-olds in an elicited production study that targeted object pronouns (in scrambling contexts). The children produced strong and weak pronouns, demonstratives, and full and bare NPs. They used these forms in different patterns at different ages (and with and without scrambling), but did not omit objects. Schaeffer believes that the absence of object omission in the elicited production task may be due to the fact that all target verbs were particle verbs, which are obligatorily transitive, implying that children adhere to this restriction. This explanation is partially confirmed by Thrift's (2003) study of object drop in the spontaneous speech of six young Dutch learners (roughly between 1;6 and 3;1). Thrift finds that there is more object drop with optionally transitive verbs than with obligatorily transitive ones. However, Thrift also finds that the highest rate of object drop occurs with telic verbs, among which she counted particle verbs. The latter finding seems to be in direct contrast to Schaeffer's findings with particle verbs in the elicited production task. Whatever the exact patterns of object omission are and whatever the role of type of data is (spontaneous speech versus elicited production), Schaeffer (in one spontaneous language sample) and Thrift (in the samples of six children) independently established cases of object drop in child Dutch.

Why are objects omitted, at least, sometimes? This question relates to the phenomenon of clitic omission in the Romance languages, which has been widely studied (Costa & Lobo, 2006; Guasti, 1993/1994; Hamann, Rizzi, & Frauenfelder, 1995; Jakubowicz & Rigaut, 2000; Tsimpli, 2001; Wexler, Gavarró, & Torrens, 2004). Jakubowicz (2005) argues that object clitic omission is a back-out strategy to avoid complex syntactic structures. The same question rises for object pronouns: does the complexity of their syntax cause processing break-down and thus lead to omission? In sections 2 and 3, we will show that object pronouns involve a less complex syntactic structure than Q-*er*. Object pronouns appear at the left edge of the VP in scrambling position. They are one-word stand-ins for full noun phrases. Q-*er* appears in the same position, but binds an empty position inside a DP with a numeral. The scrambling of Q-*er* is a form of remnant movement where a bare DP with a numeral stays *in situ*. By comparing the two kinds of pronouns, we can see if these features of the syntax of pronouns do or do not play a role in omission. We will frame this difference in terms of computational complexity, suggesting in the conclusion an extension of Jakubowicz's Derivational Complexity hypothesis.

Another relevant issue that marks a difference between object pronouns and Q-*er* — and is a potential cause for omission — is lexical complexity: Q-*er* is one of four different types of *er*'s in Dutch, each with its own syntactic and semantic properties (Bennis, 1986). Q-*er* is lexically complex, in contrast to object pronouns, which are not lexically complex in the sense of carrying multiple meanings, even if the same forms also serve as prepositional objects. The acquisition task for Q-*er* is therefore more challenging than for other pronouns, because the same lexical item has several semantic functions. This relates to the acquisition theme of form-meaning mappings and the hypothesis that one-to-many mappings are harder to acquire than one-to-one mappings (Brown, 1973; Slobin, 1985).

In sections 2 and 3, we present the syntax of object pronouns and quantitative *er* in Dutch. Based on the differences in structure, we will form our hypothesis and predictions for the acquisition of object and quantitative pronouns in section 4. The two experiments and the results of each are described in sections 5 and 6. Section 7 compares children's behavior on the two experiments. Section 8 discusses the results, and in section 9, we summarize the conclusions.

2. Object Pronouns in Dutch

We describe the properties of singular, third person, object pronouns in Dutch, which were the target in the object elicitation experiment. Pronouns take different forms depending on gender and strength, as shown in Table 1. Weak pronouns are phonologically reduced versions of strong pronouns. There are two grammatical genders: neuter and common. Grammatical gender is marked on the definite article and on pronouns. Neuter nouns take *het* 'the' and pronoun *het* 'it'. Common nouns take

determiner *de* ‘the’; the object pronouns are masculine *hem* ‘him’ and feminine *haar* ‘her’. Natural gender applies to animate nouns only distinguishing male and female people and animals. For nouns with female reference, natural gender overrules grammatical gender and triggers use of the feminine pronouns.

Table 1
Object pronoun forms in Dutch

	Common		Neuter
	Masc.	Fem.	
Strong	*hem*	*haar*	*het*
Weak	*‘m*	*‘r*	*‘t*
	‘him’	‘her’	‘it’

Although Dutch agreement typically follows natural gender whenever applicable, as in English, it may also follow grammatical gender (Audring, 2009). For example, *kind* ‘child’ in (1) is neuter. One can refer to its referent with the neuter pronoun *het* ‘it’, following grammatical gender. Alternatively, one can apply natural gender and use *hem* ‘him’ or *haar* ‘her’ in this context, provided one knows the referent’s sex.

(1) a. (A): Waar is dat kind dat daar op de stoep zat ineens gebleven?
‘Where did the child that was sitting on the pavement suddenly go?’

b. (B): Ik weet het niet, ik heb het / hem / haar helemaal niet gezien.
‘I don’t know, I didn’t see it / him / her.’

Agreement also follows natural gender when an animate referent is referred to directly, and the referent is clearly male or female, as in (2). The word *meisje* ‘girl’ in (2a) is neuter, yet the possessive pronoun *haar* ‘her’ is feminine, since the reference is a female person. The possessive pronoun *zijn* ‘his’, in (2b), signals that the intended referent is a male student.

(2) a. Heeft dat meisje haar auto wel op slot gedaan?
‘Did the girl lock her car?’

b. Heeft die student zijn auto wel op slot gedaan?
‘Did that student lock his car?’

For referents of non-animate, common nouns, such as *de fiets* ‘the bike’, which do not have a natural gender, the weak male pronoun *‘m* ‘him’ is used, serving as the default form, (3). For non-animate neuter nouns, such as *het boek* ‘the book’, the neuter pronoun *het* or *’t* ‘it’ are the grammatically correct forms, but in spoken language the default pronoun *‘m* ‘him’ is also used, (4). The strong masculine pronoun *hem* ‘him’ is decidedly odd in these contexts, as it suggests an animate referent.

(3) a. (A): Waar is je fiets?
‘Where is your bike?’

b. (B): Ik hem ‘m net in de schuur gezet.
‘I just put him in the shed.’

(4) a. (A): Heb je Mulisch zijn laatste boek gelezen?
‘Did you read Mulisch’ last book?’

b. (B): Ja, ik heb ‘m / ‘t net uit.
‘Yes, I just finished him / it.’

Audring (2009) documented recently how the Dutch agreement system is transitioning from a syntactic to a semantic system. Pronoun choice relies on a mixture of grammatical and natural gender. The object forms for animate referents are *hem* ‘him’ for males and *haar* for females. The default form for all non-animate referents is the weak pronoun *‘m* ‘it’; neuter non-animate nouns also take *‘t* ‘it’.

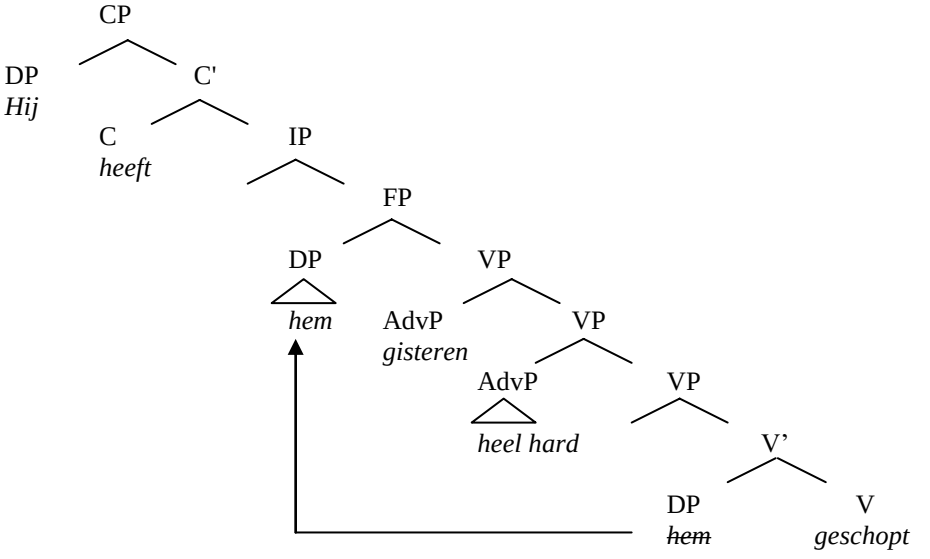
Object pronouns scramble, like definite NPs, (5a), (de Hoop, 1992). Although it is possible for a pronoun to appear in the object position inside the VP when it carries focus stress, (5b).

(5) a. Hij heeft hem gisteren heel hard geschopt. Scrambled
he has him yesterday very hard kicked
'He kicked him really hard yesterday.'

b. Hij heeft gisteren heel hard HEM geschopt. Non-scrambled
he has yesterday very hard HIM kicked
'He kicked HIM really hard yesterday.'

Scrambling has been analyzed in terms of movement to a position above the VP or by base-generating the pronoun in the high position and linking it to the verb for theta-marking purposes (Corver & van Riemsdijk, 1994). Assuming a neutral projection FP above VP for scrambling, the scrambled object appears in its specifier. The tree in (6) illustrates the structure of (5a).

(6)



Comparing the distribution of weak and strong pronouns, Zwart (1991) notes several distributional differences. One of these concerns scrambling: whereas strong pronouns can be inside the VP, in which case they must carry focus stress, (5b), weak pronouns scramble obligatorily, (7).

(7) a. Hij heeft 'm gisteren heel hard geschopt. Scrambled
he has 'm yesterday very hard kicked
'He kicked 'm really hard yesterday.'

b. *Hij heeft gisteren heel hard 'm geschopt. Non-scrambled
he has yesterday very hard 'm kicked

Zwart takes the more rigid distributional possibilities of weak pronouns to suggest a type of movement different from regular object scrambling. He argues that weak pronouns are heads and undergo head movement to the functional category T (called INFL at the time), thus effectively analyzing them as clitics which undergo clitic movement. Cardinaletti and Starke (1996, 1999), however, classify weak pronouns as a class of deficient pronouns. They make a strong case for a three-way classification of pronouns and clitics, in which weak pronouns are positioned in between strong pronouns and clitics, patterning to some extent like strong pronouns and to another like clitics. Weak pronouns cannot be coordinated with full DPs, cannot be modified and they have a highly rigid

distribution, all of which are features they share with clitics. Moreover, like clitics, weak pronouns have less restricted possibilities for reference: they can refer to animate as well as non-animate referents, whereas strong pronouns must refer to animate ones. However, weak pronouns also behave like strong pronouns: they can be complements of prepositions, are not obligatorily adjacent to the verb and in sentence coordination weak pronoun subjects can be left out of the second conjunct, which makes them full NPs, and not heads.

3. Dutch Quantitative Pronoun *er* 'there'

Quantitative *er* (Q-*er*) is one of four types of *er* pronouns in Dutch, (8); the others are existential *er*, (9), locative *er*, (10), and prepositional *er*, (11). These functions can be combined, for example, quantitative and prepositional *er* in (12) (Bennis, 1986).

(8) Hij heeft er twee gekocht. — Quantitative *er*
he has ER two bought
'He bought two (of them).'

(9) Er loopt een jongen in de tuin. — Existential *er*
ER walks a boy in the garden
'There is a boy walking in the garden.'

(10) Hij heeft er het boek gekocht. — Locative *er*
he has ER the book bought
'He has bought the book there.'

(11) Hij legt er twee boeken op. — Prepositional *er*
he puts ER two books on
'He puts two books on top of it.'

(12) Hij legt er twee op. — Prepositional and Quantitative *er*
he puts ER two on
'He puts two on top of it.'

Like any other pronoun, Q-*er* needs an antecedent in the context. Unlike object pronouns, which are stand-ins for full constituents, Q-*er* is syntactically part of a complex noun phrase modified by a numeral or weak quantifier such as *geen* 'no' or *veel* 'many'. Q-*er* thus binds an empty position inside a complex noun phrase. Q-*er* cannot stay in its base-generated position, but must scramble out, like (weak) object pronouns. After scrambling it leaves behind the numeral or quantifier as a remnant of the original noun phrase, as illustrated in (13).

(13) Hij heeft er [$_{\text{NumP}}$ twee ~~er~~] gekocht
he has ER [$_{\text{NumP}}$ two ~~ER~~] bought

Q-*er* is obligatory for count nouns in a noun-ellipsis context; omission leads to ungrammaticality, (14). Dutch stands out among the other Germanic languages which do not have such a pronoun; noun ellipsis with a numeral is perfectly grammatical in the other languages; see for example the English translation under (14).

(14) * Hij heeft twee gekocht.
he has two bought
'He bought two.'

Several analyses of Q-*er* posit that the construction contains an ellipsis site inside the DP which is licensed by Q-*er*. Coppen (1991) proposes a structure with N' ellipsis, (15a), while Corver, Van Koppen, and Kranendonk (2009) assume ellipsis of the NP, (15b).

(15) a. $[_{NP}\ [_{QP}$ twee$]\ [_{N'}\ [_{Det}$ er $[_{N'}\ \varnothing\ ]]]]$ (Coppen, 1991)
b. $[_{DP}\ [_{QP}\ [_{NumP}\ [_{nP}\ [_{n}$ er $[_{NP}\ \varnothing]]]]]]$ (Corver et al., 2009)

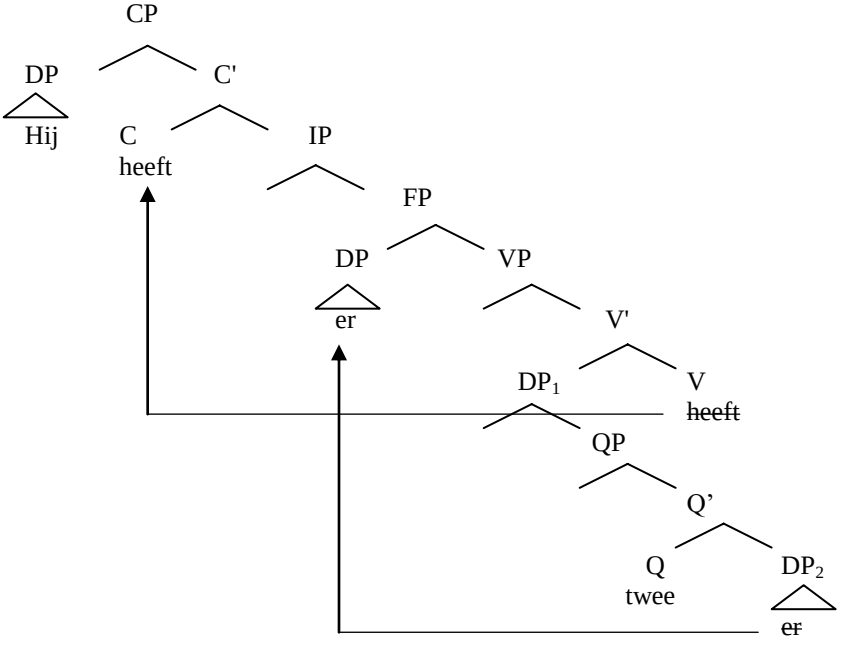
Barbiers (2009), however, rejects an ellipsis approach for Q-*er*, presenting and argument based on the fact that there is no gender agreement with Q-*er*. The choice of relative pronouns is sensitive to the neuter versus common gender distinction. *Huis* 'house' is neuter and requires *dat* 'that' as its relative pronoun, not *die* 'that', (16a). But when Q-*er* refers to a house, it takes the default common form *die* 'that', (16b), and not *dat* 'that'.

(16) a. Dit is een huis dat / *die je gezien moet hebben
This is a house that^{Neuter} / that^{Common} you seen must have

b. [Talking about houses]
Dit is er één die / *dat je gezien moet hebben
this is ER one that^{Common} / that^{Neuter} you seen must have

Barbiers takes the absence of agreement to suggest that Q-*er* is not specified for gender, nor does the presumed elided N seem to carry a gender feature, and so he concludes that there is no elided element that serves as the antecedent of the relative pronoun. Instead, Barbiers claims that Q-*er* is a DP inside another DP, and thus constitutes a constituent inside a bigger constituent. Q-*er* is the spell-out of the inner DP. Q-*er* scrambles out; this movement is obligatory, as it is for weak object pronouns. The outer DP with the numeral remains behind as a remnant. This proposal is illustrated in (17), where we assume a neutral functional projection FP above VP as the landing site for scrambling. Barbiers' proposal explains not only lack of gender agreement, but also why Q-*er* does not allow adjectives, determiners or complements in the remnant structure.

(17)



4. Hypotheses and Predictions

Are all pronouns acquired equally? We investigate whether or not there is a relation between the syntax of different pronouns and their acquisition. This question has several possible angles. It relates to the difference between object clitics and object pronouns, which is taken up in Varlakosta et al. (in prep.). We approach it here instead by comparing object and quantitative pronouns, which have different syntactic and lexical properties.

Applying the syntactic notion of economy to language development, several authors have argued that children initially avoid costly structures. For example, they prefer wh *in-situ* questions over wh-fronted questions, avoiding movement (van Kampen, 1997; Zuckerman, 2001). Jakubowicz (2005) links the use of economy to developmental constraints on working memory, arguing that these constraints are sensitive to the computational complexity of derivations. Defining a precise metric to calculate derivational complexity based on the number of instances of internal Merge, Jakubowicz argues that merging an object clitic in the argument position and subsequently moving it to a non-argument position to get licensed is computationally complex, and may therefore lead to omission (see also Jakubowicz & Nash, in press; see Jakubowicz & Strik, 2008, for application of the Derivational Complexity Metric to wh-questions). The metric is essentially a parsing metric and applies not only to L1 but to L2, SLI and adult processing as well. Tuller et al. (2011) add that other aspects of syntactic structure beyond derivational ones may also figure in the calculation of computational complexity. They mention depth of embedding and locus of embedded clauses. Pending an exact formulation of computational complexity, Tuller et al. summarize the essence across the various proposals as follows: computational complexity as determined by various factors is difficult to acquire as it requires greater processing resources. One may therefore expect late emergence, high error rates and/or avoidance.

Is there a difference in computational complexity between Dutch object pronouns and Q-*er*? Applying Jakubowicz's (2005) Derivational Complexity metric yields no differences, since both types of pronouns merge just once: the movement to the scrambled position Spec, FP. If computational complexity is sensitive only to derivational complexity, we expect no developmental differences between the two types of pronouns. However, if other syntactic aspects contribute to the computation, as Tuller et al. (2011) suggest, there are differences. In particular, the two pronoun types differ with respect to structural complexity. Q-*er* is extracted out of a complex DP structure, stranding the outer DP with the numeral, whereas object pronouns scramble as a whole, leaving no remnant structure. Scrambling a subpart of a DP may be more complex than scrambling without remant structure. If such properties of structural complexity contribute to the computational complexity of the structures in question, Q-*er* is computationally more complex. And so we may expect a developmental delay of Q-*er* in relation to object pronouns.

Another reason why Q-*er* may be acquired late is the fact that the pronoun *er* has three additional syntactic-semantic functions besides its quantitative-partitive use. *Er* thus presents a case of a form related to multiple meanings. Sorting out all the different *er*'s and the syntactic-semantic properties of each may also contribute to late acquisition, because such one-to-many mappings typically take more time than simple one-to-one mappings (Slobin, 1985).

Turning to the predictions, the reported cases of object omission all involved much younger children than the 5-year-olds in the present study (Schaeffer, 2000; Thrift, 2003). We expect to see object pronouns because the children in the Spenader et al. (2009) study reviewed above, produced them (as well as full NPs), and there was no report of object omission. The children in the present study are of a similar age, and so we may expect few omissions here as well. Moreover, the children in Schaeffer's (2000) study, who were even younger, did not omit objects. As for Q-*er*, since there are no previous studies, our study is exploratory. We have no expectations about Q-*er* and what 5-year-olds will or will not produce.

5. Experiment 1: Object Pronoun Elicitation

We tested nineteen typically-developing Dutch 5-year-olds on both the object pronoun and the Q-*er* task. For each task one additional, different child was also tested, so that each group consisted of

twenty children. Two different adult control groups were included. We first present the methods and results of each experiment separately (sections 5 and 6), and compare the results of the nineteen participants who took both tasks in section 7.

5.1. Method

Twenty 5-year-olds (12 girls, 8 boys; mean age 5;7; age range 5;0-6;0) participated in the object pronoun elicitation experiment, plus fifteen adult controls. The children were tested individually in a quiet room by two experimenters; one ran the task while the other scored the answers. Sessions were taped-recorded for later checking. The adults were tested individually by one experimenter.

The goal of this test was to establish whether children produce object pronouns in anaphoric discourse contexts. Our main point of interest is whether or not the Dutch children omit object pronouns, like children do for object clitics in clitic languages. The task for the elicitation of object pronouns was a cloze task (Varlokosta et al., in prep.). The participants saw a picture (Figure 1) presented on a laptop in MS PowerPoint while the experimenter told a short story. The task was to finish the last sentence of the story, which targeted an object pronoun. The short story introduces the referent, thus creating an appropriate context for anaphoric reference with a pronoun, (18).

(18) Exp.: The girl caught the butterfly. Now the butterfly can't fly. Why can't the butterfly fly?
The butterfly can't fly because the girl...

Participant: ... caught it.

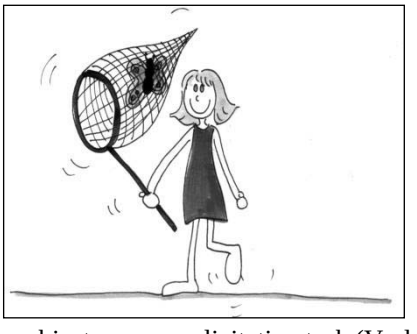


Figure 1. Picture from the object pronoun elicitation task (Varlokosta et al., in prep.).

There were twelve test items and ten fillers. All test items used a transitive verb. We used the materials that had been constructed for the cross-linguistic COST task; the selection of verbs followed the general criterion that all verbs had to be transitive in all participating languages. In translation the verb list contained the following Dutch verbs: *toedekken* 'cover', *afdrogen* 'dry', *wakker maken* 'wake up', *natspuiten* 'wet', *schilderen* 'draw', *vastbinden* 'tie', *wassen* 'wash', *eten* 'eat', *vangen* 'catch', *kammen* 'comb', *verven* 'paint', and *likken* 'lick'.

The nouns were also taken from the cross-linguistic task; they were selected on the basis of lexical acquisition (known words for 5-year-olds) and picturability. The list was not perfectly balanced for gender; there were seven common *de*-nouns and five neuter *het*-nouns. As discussed in section 2, it is not only grammatical gender that determines pronoun choice in Dutch, but also natural gender and animacy. The list included three nouns referring to a person: *de soldaat* 'the soldier', *de jongen* 'the boy', *het meisje* 'the girl' (used twice), targeting *hem* 'him' for the first two and *haar* 'her' for the last one, or their weak counterparts. There were five nouns referring to an animal, which all targeted the weak pronoun *'m* 'him': *het nijlpaard* 'the hippo', *de poes* 'the cat' (used twice), *de sprinkhaan* 'the grasshopper', *de giraffe* 'the giraffe', *de vlinder* 'the butterfly'. And there were two non-animate nouns which targeted the weak pronoun '*t* 'it', because these were neuter *het*-nouns: *het huis* 'the house', *het stukje taart* 'the piece of cake'. In the results presented below, we counted any form of pronoun as

'pronoun', without also coding the different types of forms or differentiating between strong and weak pronouns.

Before the test started there were two practice items to train the participants on the task of finishing the sentence in the shortest possible way, using a pronoun. For the two practice items we explicitly suggested to use a pronoun; we did not do this during the actual test. Half of the introductory sentences were given in the present tense and the other half in the past tense, like (18). The target sentence was expected to follow the tense of the introductory clause. The elicited tense is not analyzed for the present study.

5.2. Coding and results

We analyzed the objects in the utterances of the participants and labeled the forms as 'Pronoun' (collapsing strong and weak pronouns), 'Full noun phrase' and 'Omission'. It turned out that not all cases of object omission were ungrammatical, since some verbs were optionally transitive. In order to classify the absence of an object as grammatical or ungrammatical, each of the three authors individually judged all instances of utterances without an object. There was 94% agreement and we reached consensus about the coding after discussion of the three remaining cases. Absence of an object was counted as 'Correct omission' with the three optionally transitive verbs (*kammen* 'comb', *verven* 'paint' and *likken* 'lick'), and as 'Incorrect omission' with the nine remaining verbs, which were obligatorily transitive in the context they were used here. Moreover, the children sometimes provided another verb, different from the target verb, which was optionally transitive (for example, *spuiten* 'spray' instead of *natspuiten* 'spray wet' and *schoonmaken* 'clean' instead of *wassen* 'wash'). These were also coded as 'Correct omission'. A few responses were otherwise ungrammatical (e.g., incomplete sentence completion) and are categorized as 'Other'.

In order to get a clean picture of object forms and omission, we left out the three items with optionally transitive verbs and included only the results for the nine obligatorily transitive items. [4] Table 2 presents the results of the children, and Figure 2 compares these results with those of the adults.

Table 2
Object pronoun elicitation task: Mean numbers and standard deviation children's responses

	Mean (max. 9)	SD
Object pronoun	6.2	2.75
Full NP	0.5	1.0
Correct omission	0.1	0.31
Incorrect omission	1.55	2.06
Other	0.6	1.23

[4] An analysis of all twelve verbs, including the three items with optionally transitive verbs, essentially has the same shape as Figure 2, with the exception that there are more correct omissions (the intransitive uses of these three verbs). The percentages for the children shift a little: 66.3% pronouns, 8.8% full NPs, 7.1% correct omission, 12.5% incorrect omission and 5.4% other responses. Therefore, the percentage of ungrammatical cases of object omission is slightly lower on this analysis.

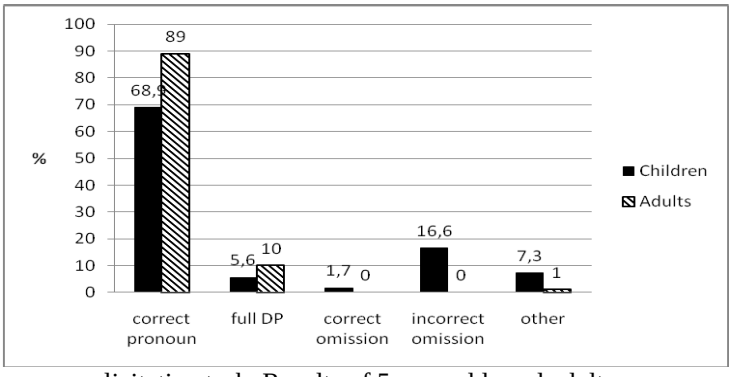


Figure 2. Object pronoun elicitation task: Results of 5-year-olds and adults.

Overall, most child utterances were appropriate continuations of the sentence: object pronouns, full NPs and correct omissions; together they formed 76.3% of the total set of responses. The children as well as the adults produced many object pronouns and some full noun phrases, with a clear preference for pronouns over NP in both groups.

However, in contrast to the adults, the children sometimes omitted objects. While some of these were grammatical (in the case of optionally transitive verbs), there were also some ungrammatical ones (16.6%). Table 3 shows the individual scores of incorrect object omission. There is quite some individual variation. About half of the participants did not omit objects or omitted them only once, whereas two omitted objects at high rates. We will discuss the results in section 8.

Table 3
Object pronoun elicitation task: Number of participants and rate of object omission

	Object omission rate
Less than 10%	11
Between 10-35%	5
Between 35-60%	2
More than 60%	2

6. Experiment 2: Quantitative *Er* Elicitation

6.1. Method

Twenty children were tested on the Q-*er* elicitation task (11 girls, 9 boys; mean age 5;6; age range 5;0-6;0); this included the nineteen who also participated in Experiment 1. Another control group of fifteen adults was also tested. The same procedure was used as in Experiment 1. Those children, who did both tests, were tested on each task in separate sessions.

The task for the elicitation of the Q-*er* was disguised as a guessing game about the number of entities on a picture (Gavarró et al., in prep.). The child had a pile of cards with pictures and held them up one by one. The experimenter, who was sitting across from the child, could not see the picture. But on the back of each card a part of the picture was shown, so that the experimenter could make a guess which the child had to evaluate. When the experimenter guessed incorrectly, the child had to provide the correct answer using a Q-*er* construction. There were twelve test items and ten filler items; for the filler items the experimenter made correct guesses.

One of the pictures is shown in Figure 3. The experimenter presents her guess as a yes/no-question; the target answer was a Q-*er* construction, (19). Note that the experimenter's guess introduces the antecedent (here, suitcases) and thus licenses the replacement of the noun in a Q-*er* construction.

Figure 3. Picture from the Q-*er* elicitation task (Gavarró et al., in prep.).

(19) Exp: Neemt ze drie koffers mee?
Takes she three suitcases with?
'Does she take three suitcases?'

Child: Nee, ze neemt er twee mee.
No, she takes Q-*er* two with
'No, she takes two (of them).'

In order to prime production of Q-*er*, all participants were shown how to use Q-*er* in a training session before the actual experiment started. When a participant did not produce the target Q-*er* in the training, the experimenter modelled a Q-*er* construction and explicitly told the participant that this was another, shorter way of answering, encouraging him or her to use this shorter way by letting them repeat it. There were four practice items. During the actual test the experimenter did not correct the participants anymore.

Given the nature of the experimenter's question, ellipsis is very natural form of reply. In fact, elliptical forms that were produced a lot were *Nee, twee!* 'no, two!' or simple *Nee!* 'no'. Q-*er* does not occur in such cases, as it only occurs in sentences with a verb, and so it was essential that participants produce full clauses. Children were stimulated to provide a full sentence (*Can you say that in another way?*). After testing about two thirds of the child participants it became clear that children often answered with an elliptical utterance nevertheless. With the remaining participants, we therefore enforced complete utterances whenever they produced an elliptical answer by providing the start of the sentence (*OK, and now say it like this:* "*No, she has…".*). Thus, the experimenter provided the subject and verb of the sentence, which the participants then had to repeat and finish, so that there was a syntactic context for providing a Q-*er* and a numeral. After doing a few items this way the child often picked up this model and produced full clauses herself.

6.2. Coding and results

We coded all responses with complete sentences. There were quite a lot of utterances with incomplete sentences, of the type *Nee, twee!* 'No, two!' (n=98) and *Nee!* 'No!' (n=43). Of the total dataset of 240 utterances we thus left out 141 data points (59%) and analyzed the remaining utterances, coding whether they involved Q-*er*, a full NP, omission, or doubling. Table 4 presents the results of the children and Figure 4 compares these results with those of the adults.

Table 4
Q-er elicitation task: Mean numbers and standard deviation children's responses

	Mean (max. 12)	SD
Q-*er*	4.26	3.5
Full NP	5.89	2
Omission	1.16	0.9
Doubling	0.68	0.7

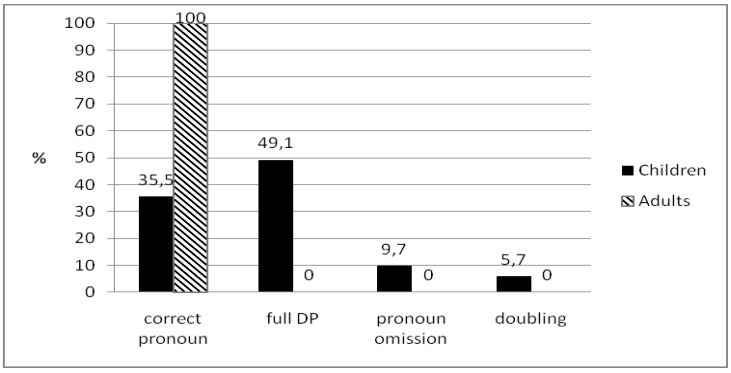


Figure 4. Results Q-*er* elicitation task: Results of 5-year-olds and adults.

The adults produced 100% Q-*er*; this was to be expected because they were explicitly instructed to use the "short" *er*-form in the training. The children, who received the same training in which the use of Q-*er* was modeled by the experimenter and repeated by the children four times, produced only 35.5% Q-*er*. They produced many full NPs (49.1%). There was some omission (9.7%), which in this structure is always ungrammatical (cf. (14)). And there were a few cases of doubling where a Q-*er* and a full NP co-occurred (5.7%), for example, *Hij heeft er drie paarden* 'he has Q-*er* three horses'. Pronouns and full NPs are grammatical; they constituted 84.6% of the total set of responses. Pronoun omission and doubling are ungrammatical constructions, 15.4%. We discuss these results in section 8.

7. Comparing the two pronoun tasks

Figure 5 summarizes the children's results on the two tasks, integrating Figures 2 and 4. Grammatical responses included pronouns and full NPs (plus correct omissions in the object pronoun task). The number of grammatical utterances was moderately high: 76.2% for object pronouns and 84.6% for Q-*er*. This is no real surprise because the children are at an age at which they are not expected to make many syntactic mistakes. The 5-year-olds were not at ceiling, however; there were quite some cases of incorrect omission in both tasks: 16.6% in the object pronoun task and 9.7% in the Q-*er* task. The former were unexpected given previous studies (Schaeffer, 2000; Spenader et al., 2009).

Figure 5 furthermore reveals an important difference between the two tasks: the children produced more pronoun forms on the object pronoun task (68.9%) than on Q-*er* (35.5%). This difference is remarkable given that in both experiments the experimenters gave explicit instructions during the training to produce the shortest possible form. The training was especially elaborate in the Q-*er* task, where the Q-*er* form was modeled with four training items. Despite this instruction and training the children often produced a full NP, which qualifies as a possible, grammatical alternative, but is not the shortest possible form.

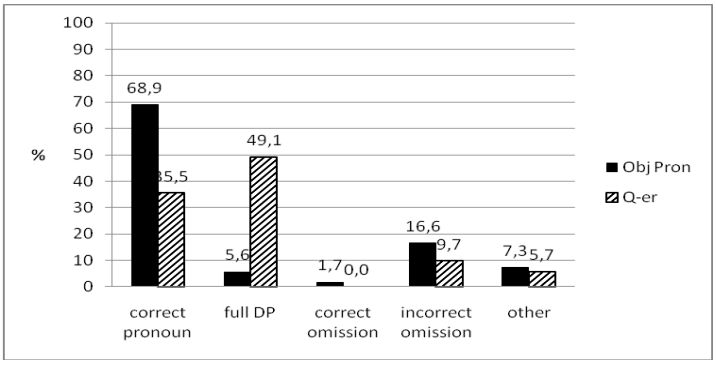


Figure 5. Children's results on object pronoun and Q-*er* elicitation.

Nineteen of the children in our study participated on both tasks. With these nineteen, we performed an individual subject analysis, focusing on pronoun use. We labeled the individual scores on each task as high, intermediate, or low use of pronouns. For the object pronoun task with nine items (with obligatorily transitive verbs) we set the definitions as follows: "High" was 7 to 9 pronoun responses out of 9, "Intermediate" 4 to 6 out of 9, and "Low" 0 to 3 out of 9. For the Q-*er* task, where the maximum score of Q-*er* use was 12, we defined "High" as 10 to 12 target pronoun responses out of 12, "Intermediate" 6 to 9 out of 12, and "Low" 0 to 5 out of 12. This analysis is presented in Figure 6.

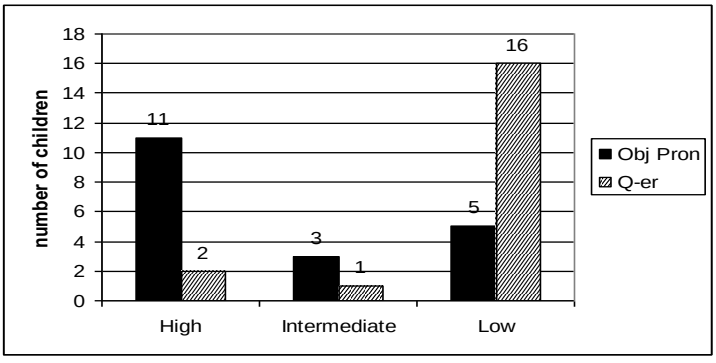


Figure 6. Individual subject levels of pronoun use.

Figure 6 shows a discrepancy in the use of pronouns across the two tasks. Most (fourteen out of nineteen) children score high or intermediate on the object pronoun task, producing many or relatively many pronouns. In contrast, most of them (sixteen) score low on the Q-*er* task, hardly producing any Q-*er*. The use of pronouns in the object pronoun task is significantly higher than in the Q-*er* task ($t(18) = 3.892$, $p=.001$). The scores on the two tasks, however, do not correlate ($r = .231$, $p>.3$). This may be due to the low number of children who produced high levels of Q-*er*. It may also be that the acquisition of Q-*er* proceeds independently of the acquisition of object pronouns. This would not be surprising given that the two types of pronouns have very little in common syntactically, other than the fact that they both scramble.

8. Discussion

We set out to investigate if the acquisition object pronouns and Q-*er* is sensitive to their different syntactic properties. Jakubowicz's (2005) Derivational Complexity metric predicts no difference, because both pronouns merge once and thus come out as equally complex. However, if other syntactic properties come into play in the calculation of computational complexity, as suggested by Tuller et al. (2011), we may expect differences.

Do children supply an object pronoun or Q-*er* in contexts where objects are obligatory, or do they leave it out? Discussing first the latter part of this question about omission, the rate of pronoun omission in obligatory contexts was 19,6% for object pronouns and 9,7% for Q-*er*. The children in this experiment were five years old, which is relatively old, and so an omission rate of almost 20% may be considered quite high. It must be noted, however, that there was quite some individual variation: most children either never omitted objects, or just a few times, and so the high rate was mainly due to a small subset of four children (out of twenty). This result contrasts with two other elicited production studies, which did not find omission (Schaeffer, 2000; Spenader et al., 2009). We do not know why there is a discrepancy across these studies. It may be that the different verbal contexts played a role, and that ours turned out to be sufficiently sensitive to register any weaknesses with respect to obligatory objects. In any case, it seems that object omission is a developmental fact of Dutch, even if it does not happen in all contexts. We have thus found another type of language to add to the acquisition literature on object clitic omission in the Romance languages. Dutch as a Germanic language has weak and strong pronouns, but no clitics, and Dutch pronouns now turn out to be vulnerable too. Once the Dutch data will be compared to those of 5-year-olds acquiring clitic languages, we will be able to say whether or not object pronouns are omitted at similar rates as object clitics by 5-year-olds (Varlakosta, in prep.). If those rates turn out to be different, it suggests that pronouns and clitics differ essentially, which is a topic of debate in theories of syntax (Cardinaletti & Starke, 1996, 1999; Zwart, 1991).

Do children produce pronouns, and more specifically, do they do so equally well for object pronouns and Q-*er*? It is clear that they do not. The group scores of pronoun use were much higher for object pronouns than Q-*er*. Furthermore, the individual subject scores show a much higher number of children who systematically produce object pronouns as compared to the few who regularly used Q-*er*. Moreover, children produced a pattern of object pronouns and full NPs similar to that of the adults: mostly pronouns and some full NPs. In contrast, the children differed dramatically from the adults in their use of Q-*er* vis-à-vis full NPs: the adults produced exclusively Q-*er*, but the children only 35.5%. Most often the alternative answer contained a full NP, which is perfectly grammatical and also appropriate in the present context. Nevertheless, the relatively low rate of Q-*er* is remarkable in view of the fact that there were explicit instructions about Q-*er* ("Say it in a shorter way with *er*"). Moreover, the children took an explicit training in which Q-*er* was modeled by the experimenter and subsequently repeated by the children. Despite training and instructions children did not oblige and resorted to full NPs, possibly to circumvent the target construction with Q-*er*.

It may be, of course, that the difference between children and adults for Q-*er* is due to the fact that children deal differently with instructions than adults, and maybe understand them differently. This raises the question as to how appropriate the present elicitation task is for determining acquisition of the Q-*er* construction.[5] Berends, Veenstra, and Van Hout (in press) compared the present elicitation task with a sentence repetition task with Q-*er* with the same group of children we investigated here. The repetition task also revealed potential problems with Q-er, as more than half of the children omitted Q-*er* twice or (much) more often (on a total of twelve items). Berends et al. concluded that a repetition task may indeed provide a better tool for measuring Q-*er* abilities, since the Q-*er* elicitation task is not restrictive enough in that it allows too much freedom to produce full NPs. However, repetition of simple, short sentences with Q-*er* may not be sensitive enough as the task can be accomplished by straightforward verbatim repetition which does not recruit any syntactic processing. It remains to be investigated if a better method can be developed.

Yet, another alternative interpretation of children's relatively low use of Q-*er* and high use of full NPs is that full NPs are equally good to use in the context of our guessing game, possibly even more so than in the object pronoun task.[6] The fact remains, however, that in both tests we gave explicit instructions about using the shorter form and modeled the use of pronouns in the training, and with even more items in the Q-*er* task than in the object pronoun task. And yet, the children did not follow up the instructions in the Q-*er* task, whereas they had no problems with them in the object pronoun task.

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5 As one reviewer suggested.

6 As two reviewers remarked.

In sum, we take our results to mean that most of our 5-year-olds have essentially acquired the syntax of object pronouns. In stark contrast, all but two or three children struggle with Q-*er* and essentially did not use it. We take this is as an indication that Q-*er* is not robustly acquired by the age of five. We conclude that the present results suggest that object pronouns are acquired earlier than Q-*er*, pending the development of better methods to test Q-*er*.

Why would there be a difference in acquiring the two types of pronouns? Jakubowicz's (2005) Derivational Complexity metric does not explain the difference. We have argued above that the two pronoun types differ with respect to structural complexity. And so we now conclude that structural complexity contributes another factor to the calculation of computational complexity, supporting Tuller et al.'s (2011) claim: if higher computational complexity requires greater processing resources and if structures with high complexity are difficult to acquire, one may expect late emergence, high error rates and/or avoidance. We have found avoidance — most children avoided the Q-*er* construction — as well as error rates — in a few individual children who had high levels of object pronoun omission.

What exactly is the difference in computational complexity between the two types of pronouns? The difference seems to stem from the fact that Q-*er* is extracted out of a complex structure and leaves a remnant structure with a numeral behind, while pronouns do not leave remnant structure. Furthermore, Q-*er* links to a numeral inside a DP to check a partitive feature, whereas object pronouns associate with the verb to check a theta-feature. A theta-relation is a straightforward link between the pronoun and the head of the main projection line, the verb. The partitive feature on the other hand requires a more complex link to a phrase inside another phrase, which, moreover, branches off of the verb's main projection line. The difference in syntactic complexity of these two types of links can be formalized in various ways. It could be framed in theories of Probe-Goal relations (Adger, 2003), Connectedness (Kayne, 1984) or Domains and Dynasties (Koster, 1987). Formalization of the syntactic complexity difference falls outside the scope of this article.

Last, but not least, we bring up the issue of lexical complexity again, which may also contribute to the late acquisition of Q-*er*: the fact that *er* carries multiple syntactic-semantic functions. It thus presents a case of a one-to-many function in form-meaning mappings which have been claimed to be hard to acquire (Slobin, 1985). At this point we cannot tell if the major reason for the late acquisition of Q-*er* is computational or lexical complexity, or maybe both. It is not clear how the two can be disentangled in future research.

9. Conclusions

Object and Q-*er* pronouns are not acquired equally. We attribute this difference to their different syntax. The use of Q-*er* involves more sophisticated syntactic resources, in particular, it relies on a more complex structure. Q-*er* occurs at the left edge of the VP and binds an empty position in a DP with a stranded numeral, whereas object pronouns are simply stand-ins for full NPs with no remnant structure after scrambling. Moreover, the fact that Q-*er* is one of four different *er*-types may add to its late acquisition.

We have proposed an extension of Jakubowicz's (2005) learnability theory based on computational complexity. In addition to her hypothesis about processing and working memory resources imposed by derivational complexity, we have argued that structural complexity brings in another factor in the full-picture calculation of computational complexity.

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