GÖTEBORG UNIVERSITY
Department of Swedish language

Quantification in Swedish child language
- with special reference to the quantifier expression alla

Stellan Petersson
Research essay, 10 credits
Swedish language, advanced level 2
Autumn 2006
Supervisor: Elisabet Engdahl

Abstract[1]

The purpose of this paper is to analyse and discuss Swedish speaking children's use and understanding of quantification with special reference to the quantifier expression *alla* ('all'). The data has been collected from *Richthoff's corpus*, the *Göteborg Spoken Language Corpora* and an observation period I carried out at a preschool in Göteborg.

After describing and discussing several aspects of the syntax and the semantics of Swedish quantification, I argue that we have good reasons to treat Swedish quantifier expressions as a separate part of speech (labelled Q). I then address the following questions: Which quantifier expressions do children use? Which quantifier expressions do adults use? How do children use quantifier expressions? How are quantifier expressions used in speech directed to children? How do children interpret *alla* – generically or specifically? When do they start interpreting *alla* generically? I try to see what the data suggest as answers to these questions, with special reference to the quantifier expression *alla*. I also present data on the syntactic and semantic problems the children appear to have.

In section 5 I explain some of the data by introducing the psychological notion "theory of mind", a label for social cognition apparent in adults. I argue that some of the children's difficulties with quantifier expressions might be due to their difficulties with shifting perspective in a social situation. Some of their problems, however, seem to arise because the category Q is not fully developed in child language – sometimes they therefore treat the quantifier expressions as other categories. I argue that the children sometimes treat quantifier expressions as modifiers to nouns. At the end of the paper I suggest an account of children's difficulties with quantification based on a proposal for English and Korean speaking children (Kang 2001).

Table of contents

References

Bloom, Paul 2000. *How children learn the meanings of words*. Cambridge/London.

Bohnacker, Ute 2003. Nominal phrases. In Platzack, Josefsson and Håkansson (eds.), *The acquisition of Swedish grammar*. Pages 195–261. Amsterdam/Philadelphia.

Brinck, Inga 2006. The role of intersubjectivity for the development of intentional communication. To appear in C. Sinha, E. Itkonen, T. Racine and J. Zlatev (eds.), *The Shared Mind*.

Carnie, Andrew 2002. *Syntax – a generative introduction*. Malden.

Chomsky, Noam; Fitch, Tecumseh and Hauser Marc D. 2002. The faculty of language: What is it, who has it, and how did it evolve? *Science 298*. Pages 1569–1579.

Croft, William and Cruse, Alan D 2004. *Cognitive Linguistics*. Cambridge.

Delsing, Lars-Olof 1993. *The internal structure of noun phrases in the Scandinavian languages. A comparative study*. Lund.

Geurtz, Bart 2003. Quantifying kids. *Language acquisition 11*. Pages 197–218.

Kang, Hye-Kyung 2001. Quantifier spreading: linguistic and pragmatic considerations. *Lingua 111*. Pages 591–627.

Lindblom, Björn; Stevens, Kenneth N; Lacerda, Francesco; Williams, Karen A and Kuhl, Patricia K 1991. Linguistic experience alters phonetic perception in infants by 6 months of age. *Science 255*. Pages 606–608.

Van Loosbroek, Erik and Drozd, Kenneth F 2006. The effect of context on children's interpretations of universally quantified sentences. In Van Geenhoven, Veerle (eds), *Semantics in acquisition* (Studies in theoretical psycholinguistics 35).

Radford, Andrew 2004. *Minimalist syntax: exploring the structure of English*. Cambridge.

Radford, Andrew 1990. *Syntactic theory and the acquisition of English syntax*. Oxford.

Richthoff, Ulla 2000. *En svensk barnspråkskorpus. Uppbyggnad och analyser*. Department of linguistics. Gothenburg university.

Platzack, Christer 1998. *Svenskans inre grammatik – det minimalistiska programmet. En introduktion till modern generativ grammatik. en introduktion till det minimalistiska programmet*. Lund.

Strömqvist, Sven and Plunkett, Kim 1992. The acquisition of Scandinavian languages. In Slobin, Dan I. (eds.), *The crosslinguistic study of language acquisition*. Pages 457–556.

Teleman, Ulf; Hellberg, Staffan and Andersson, Erik 1999. *Svenska Akademiens Grammatik*. Stockholm.

Westerståhl, Dag and Peters, Stanley 2006. *Quantifiers in language and logic*. Oxford.

Appendix 1

Additional data from Richthoff's corpus and the GSLC:

	Richthoff's corpus	**GSLC**
lite	195	3643
mycket	98	574
det mesta	0	4
ingen[1]	221	1421
inget	101	553
inga	47	522
någon	73	546
något	47	573
några	66	317
båda	24	189
bägge	2	47

[1] In some cases it has been hard to determine whether the child says *ingen* or *inget*. In these cases I have counted it as *ingen*.

Appendix 2

The syntactic structure of the quantifier constructions

1) Head + indef DP: *Alla deltagare*. ('All participants')

```
            QP
            |
            Q'
          /    \
         Q       DP
       alla      |
                 D'
               /    \
              D      NP
              ø      |
                     N'
                     |
                     N
                  deltagare
```
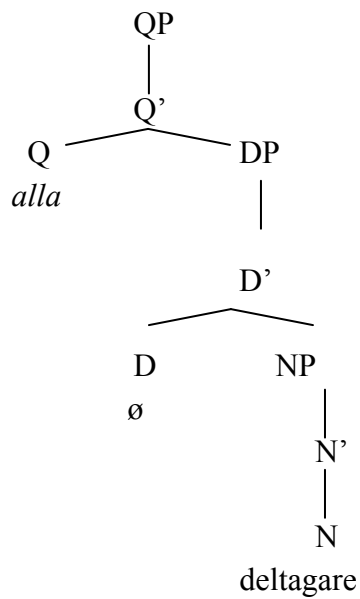
2) Head + definite DP as complement: *Alla deltagarna*. ('All the participants')

```
            QP
            |
            Q'
          /    \
        Q        DP
      alla       |
                 D'
               /    \
              D      NP
         deltagar_i-na   |
                         N'
                         |
                         N
                        t_i
```
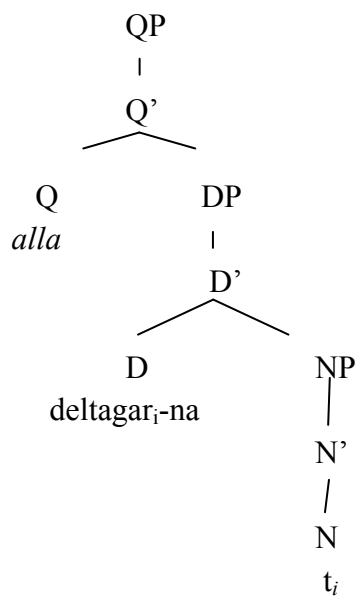
3) Head: *Alla*. ('Everybody')

```
QP
 |
 Q'
 |
 Q
alla
```
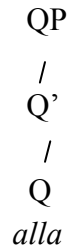
4) Head + AP or NumP: *Alla gula/tio*. ('All yellow/ten')

```
        QP
         |
        Q'
      /    \
   Q        AP   or   NumP
  alla      |          |
           A'
                     Num'
           |          |
           A
                     Num
         gula         tio
```
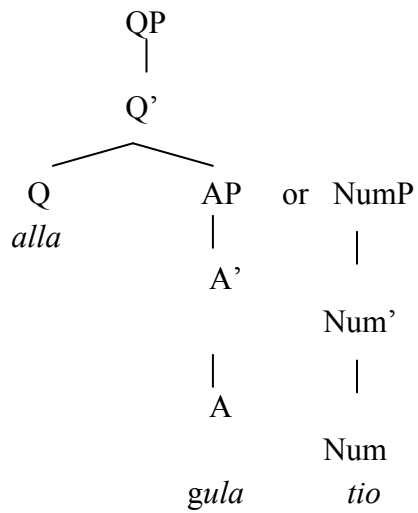
5) Head + PRN: *Alla de*. ('All of them')

```
        QP
         |
        Q'
      /    \
   Q         DP
  Alla       |
            D'
          /    \
        D        NP
        ø         |
                 N'
                  |
                 PRN
                  de
```
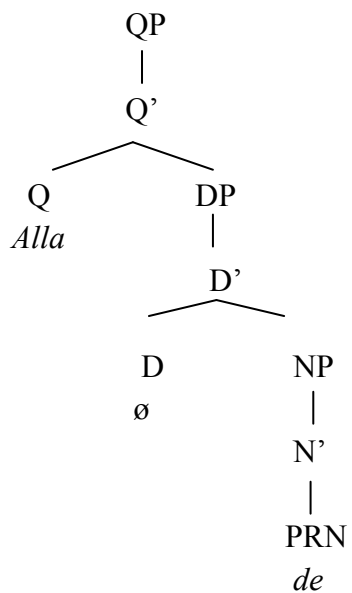
6) Head + PRN + N: *Alla mina bröder.* ('All of my brothers')

```
                        QP
                         |
                        Q'
                       /  \
                      Q    DP
                           |
                    Alla
                          D'
                         /  \
                        D    NP
                      mina    |
                             N'
                              |
                              N

                           bröder
```
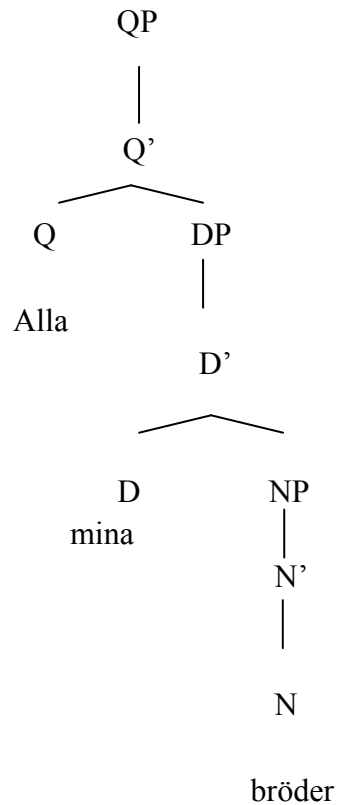
This tree needs some explanatory remarks. In the text I represent the structure as Head + PRN + N but in the tree I represent the pronoun as a determiner. I admit that this is not elegant, but I wanted to separate this kind of possessive construction from noun phrases such as *Alla deltagarna*. That is why I choose to call the structure Head + PRN + N in the text, even though that might not be the correct syntactic analysis. As far as I can see, this does not in any way bear negatively on neither my results nor my discussion.

7) Head + CP: *Alla som kom.* ('Everybody that came')

```
            QP
            |
            Q'
          /    \
        Q        CP
      alla        |
                  C'
                /    \
              C        TP
             som      /  \
                    DP     T'
                    ø     /   \
                         T      VP
                         ø      |
                                V'
                                |
                                V
                               kom
```
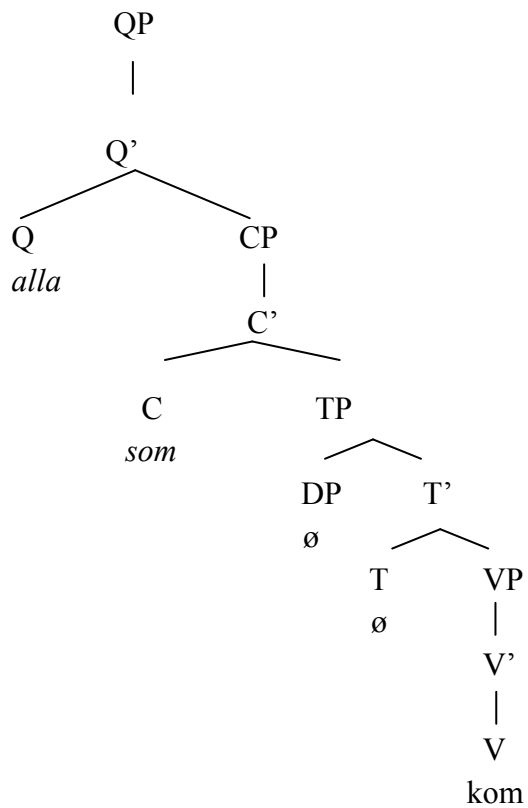
8) Head + Adj + N: *Alla små stjärnor* ('All little stars')

```
          QP
          |
          Q'
        /    \
      Q        NP
    Alla      /   \
            AP      N'
            |        |
            A'       N
            |      stjärnor
            A
           små
```
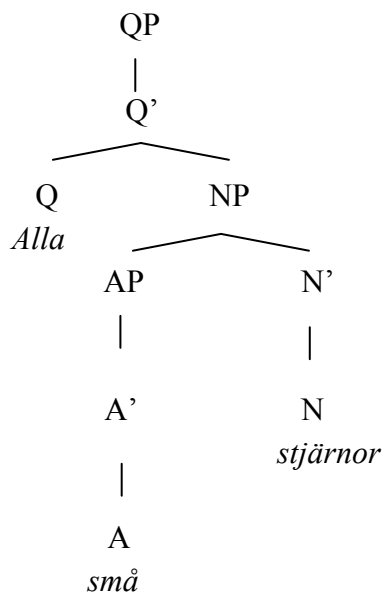
Appendix 3

List of the books at the preschool (only title and author's surname noted)

1. *Billy och grodan*. Stenberg 2004.
2. *Busiga Bebben kommer hem.* Svensson 1995.
3. *Castor odlar*. Klinting 1997 (delvis trasig).
4. *Emma damsuger*. Wolde 1995.
5. *Ensammast i världen*. Eggens/Nyggren 2003.
6. *Grodan hittar en vän*. Velthuijs 2001. *Översättning Sundström 2001*
7. *Grodan är modig.* Velthuijs 1995. Översatt.
8. *Grodan och kärleken.* Velthuijs 1989.
9. *Gullhöna, gullhöna*. Brown 1988, översättning Swahn 1991
10. *Hjälphunden.* Bodström 2002.
11. *Ja-trollet och nej-trollet*. Edelfeldt 2002.
12. *Långa ben*. Tidholm 1999
13. *Mumin och överraskningen*. Sonesson 2002.
14 *Nasses tax. Nordqvist 1991.*
15. *Pannkakstårtan*. Nordqvist 1984.
16. *Pappa kommer*. Lindahl 2004
17. *Rut och Knut klär ut sig.* Wirsén 1998.
18. *Rut och Knut lagar mat.* Wirsén 1998.

19. *CD-skiva som de lyssnar på under vilostund. "Avslappning för barn". Spår 2. "Fantasiresan". Christina Divén 1997.*

Alla did not appear in these books:

Castor odlar. Klinting 1997 (delvis trasig).
Gullhöna, gullhöna. Brown 1988, översättning Swahn 1991
Emma damsuger. Wolde 1995.
Ja-trollet och nej-trollet. Edelfeldt 2002.
Rut och Knut klär ut sig. Wirsén 1998.

Varje appeared in these books:

1. *Busiga Bebben kommer hem.* Svensson 1995
2. *Castor odlar* Klinting 1997

1. Introduction

9:00 am. Circle time has just finished at the preschool. The children and teachers have been singing about bus drivers, talking about who is absent and who is present and they are now going to discuss today's activities. One of the preschool teachers says *Idag ska alla gå ut* ('Today everybody's going to go outside'). Some of the children look a bit worried and ask simultaneously *Får jag också gå ut?* ('May I go outside as well?').

In conversations I have had with several preschool teachers, they said the situation described above is very common. Children's problems with quantifier expressions such as *alla* are well known among preschool teachers.

The phenomenon is familiar to researchers working with language acquisition as well. The problem was first presented by Inhelder and Piaget in 1959 (cf. Geurtz 2003). The researchers presented children with displays of coloured squares and circles and asked them questions that included the quantifier expression *all*. They got the following kind of answers:

Scene: 14 blue circles, 2 blue squares, 3 red squares.
Interviewer: Are all the circles blue?
Child: No, there are two blue squares.

Children's use and understanding of quantifiers and quantifier expressions is a lively field of investigation today (cf Van Loosbroek and Drozd 2006). The literature on Swedish speaking children's use and understanding of quantification is, however, sparse. How do Swedish speaking children use quantifier expressions, such as *alla* ('all')? Why do they have problems with quantifier expressions such as the one described above? In this paper I address these questions.

1.1. Purpose of the study

The purpose of this study is threefold. First, descriptions of the syntax and semantics of quantification usually focus on English. The purpose of section 2 is to discuss and describe the syntax and semantics of quantification in Swedish with special reference to the quantifier expression *alla* and to discuss to which part of speech *alla* belongs.

Second, as mentioned above no previous studies have focused on Swedish speaking children's use and understanding of quantification. Basic research is therefore needed. The purpose of section 4 is to present data on Swedish speaking children's use of Swedish quantifier expressions and compare it with data on Swedish speaking adults' use of Swedish quantifier expressions. Another aim is to show data regarding how *alla* is used by Swedish speaking children and how *alla* is used in speech directed to children.

Third, my aim is to explain at least some of the data I present in section 4. I do this in section 5. In section 5 I also present an explanation that has been proposed for English and Korean speaking children's difficulties with quantifier expressions. I address the question of whether this explanation is compatible with the explanation I propose for my data.

1.2. Data

I have collected data from three sources. First, I have used *Richthoff's corpus*, a corpus of Swedish child language. The corpus, which is named after its creator Ulla Richthoff, consists of transcriptions of one-to-one interactions during daily activities such as playing, having dinner and reading/listening to bedtime stories between adults (parents and grandparents) and four monolingual children named Anton, Harry, Bella and Tea. The children were between 18 and 48 months of age at the time of the recordings. The families were financially and socially middle class and living on the west coast of Sweden (see Richthoff 2000 for more detailed information). *Richthoff's corpus* consists of 152,065 words. Second, I used the *Göteborg Spoken Language Corpus* (GSLC). The GSLC constists of transcriptions of spoken dialogue from different social activities. The number of words in the GSLC is 1,416,248. Third, I have data from an observation that I carried out in May 2006 at the preschool Nova in Göteborg. The children at the preschool were between 24 and 36 months at the time of the observation (see section 4).

1.3. Theoretical framework

Chomsky *et al.* (2002) separate "FLN", that is "Faculty of Language in the Narrow Sense", from "FLB", that is "Faculty of Language in the Broad Sense". The picture below illustrates the point.
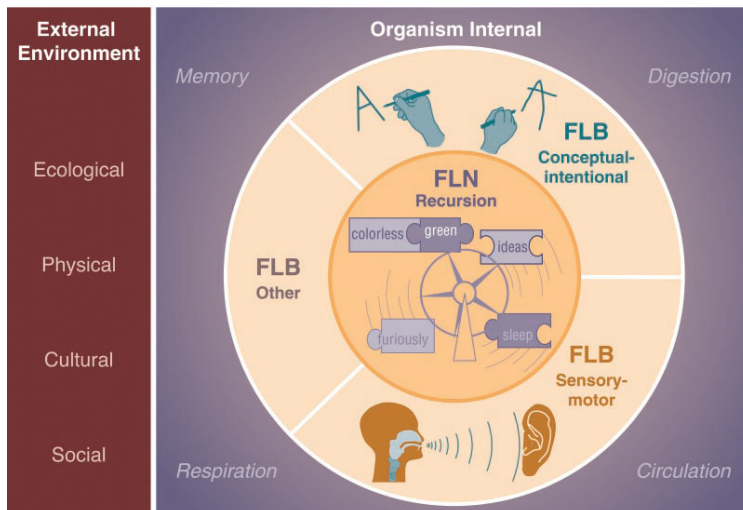
Figure 1. Schematic representation of organism-external and internal factors related to the faculty of language (Chomsky et al. 2002).

FLN is entirely devoted to recursion, i.e. the syntactic property of human language that allows us to produce (in theory) infinitely long sentences. This subsystem of the human brain is, of course, not the only relevant field of enquiry for linguists. Knowledge of semantics and pragmatics is located in the conceptual-intentional subsystem, and knowledge of phonology is located in the sensory-motor subsystem. Together these subsystems build up the phenomenon referred to as *language*.

This perspective on language is important to my reasoning in the sections below. I have located a specific problem children appear to have in their linguistic activities (the use and understanding of quantification). One possibility is that this problem is not *only* a semantic problem, *only* a syntactic problem or *only* a pragmatic problem but a mixture. However, the possibility that different subsystems are involved in a single problem does not imply that the distinctions between the different subsystems should not be upheld.

I find that for reasons of simplicity and explanatory power we should favour accounts that separate the linguistic systems. [1]

---

[1] This view is not universally accepted. It is explicitly rejected by scholars working in cognitive linguistic frameworks (eg. Cognitive Semantics and Construction Grammar). See Croft and Cruse (2004) for critical discussion and rejection of this view and Chomsky *et al*. (2002) for arguments in favour of it.

1.4. The emergence of quantification in child language

Below, I outline the developmental path of child language. Scholars have different views and ideas regarding details, but this is an approximate developmental order I suppose most scholars accept. Radford (1990) refers to the description of linguistic stages below as the standard view among scholars.

The child goes through what is called the *prelinguistic* stage between 0 and 12 months (cf Radford 1990:20). This period is characterized by the appearance of babbling. The babbling becomes more and more language specific and at the age of 6 months the child has developed sensitivity to language specific phonological structures (see Lindblom *et al*. 1991).

During the *single word* stage, between the age of 12 and 18 months, the child begins to utter single words in isolation. These words have a semantic content. But the words are not combined with other words in any systematic way and the words are not inflected; the child still does not have any morphological or syntactic knowledge. Communicative skills are, moreover, very modest during this stage. Between 14 and 18 months, children typically start co-ordinating their play. They play side by side, and sometimes with different sorts of toys:

> They recognize each other's presence, but do not co-ordinate their means or goals of action. Playing next to each other relates them indirectly. Yet they are seeking each other's company, sometimes glancing in the direction of the other. (Brinck 2006:4)

Around the age of 18 months the child enters the *early multi-word stage*. At this time the child begins to inflect words, assigning affixes and combining words to phrases in a systematic way – the morphological and syntactic systems have emerged. According to Radford (1990), the syntactic system is *thematic* during this stage. In other words this means that the child only uses words with descriptive content or at least only words that belong to the lexical word classes i.e. nouns, verbs, adjectives and prepositions. They do not use determiners or quantifier expressions at the early multi-word stage.

At approximately 36 months, the child begins to develop what is called theory of mind (Brinck 2006). This involves the ability to attribute beliefs and desires to other agents. In other words, at this age the child begins to develop a more mature kind of social understanding.

Quantifier expressions such as *all* emerge around 24 months of age according to Radford (1990). In Swedish child language the emergence

of quantifier expressions has been observed to take place simultaneously with or even slightly before the development of the first inflectional morphemes, i.e. the plural suffix and the suffix encoding singular and definite. Strömqvist and Plunkett (1990) show data where the emergence of plural suffixes and quantifier expressions take place approximately at the age of 24 months (Strömqvist and Plunkett 1990:24, 80). Bohnacker (2003) shows data where the use of quantifier expressions emerges as early as 20 or 21 months (Bohnacker 2003:214).

2. Quantification in Swedish

I distinguish between **quantifier expressions** and **quantifiers**. Quantifier expressions are syntactic objects. Quantifiers are the semantic objects denoted by (or signified by) quantifier expressions.

2.1. The syntax of Swedish quantification

In the *Swedish Academy Grammar* (Teleman *et al.* 1999, hereafter referred to as *SAG*) a flat structure is used to describe the noun phrase (cf. SAG 3: 13): [2]

Prepositional attr. [3]			Noun	Postpositional attr.
Definite attr.	Quantity attr.	Adjectival attr.		
Dessa	*två*	*stora*	*böcker*	*om Hjo*
('these	two	big	books	about Hjo')

Quantifier expressions function as *quantity attributes* in the noun phrase.

2.1.1. The DP analysis

The flat structure presented above fails to take several empirical facts into account. Consider the following noun phrase:

---

[2] A hierarchical structure is, however, described in a footnote in SAG 3:14: "<alla<dessa<många<vackra<blommor från Holland>>>>>".
'All these many lovely flowers from Holland'
[3] *Attr.* stands for *attribute*.

1) Jag köpte den stora boken med det blå omslaget.
  'I bought the big book with the blue cover.'

The following elliptical sentences indicate that the syntactic structure of the noun phrase is more complex than is proposed by the flat structure. The bracketed part of the clause on the left side of the conjunction is equivalent to the part that is left out in the clause on the right side of the conjunction (the CAPITALS indicate stress). I assume that what is left out must be a syntactic constituent.

2) Jag köpte DEN [stora boken med det blå omslaget] och inte DEN [...]
   I   bought THAT [big book with the blue cover] and   not THAT

3) Jag köpte den STORA [boken med det blå omslaget] och inte den LILLA [...].
   I   bought the BIG   [book   with the blue cover]   and not the LITTLE

4) Jag köpte den stora boken med det BLÅ [omslaget] och inte det RÖDA [...]
   I   bought the big book   with the BLUE [cover]   and not the RED

The following structure can account for these empirical facts:[4]

---

[4] See Carnie (2002) and Platzack (1998) for introductions to X-bar theory.
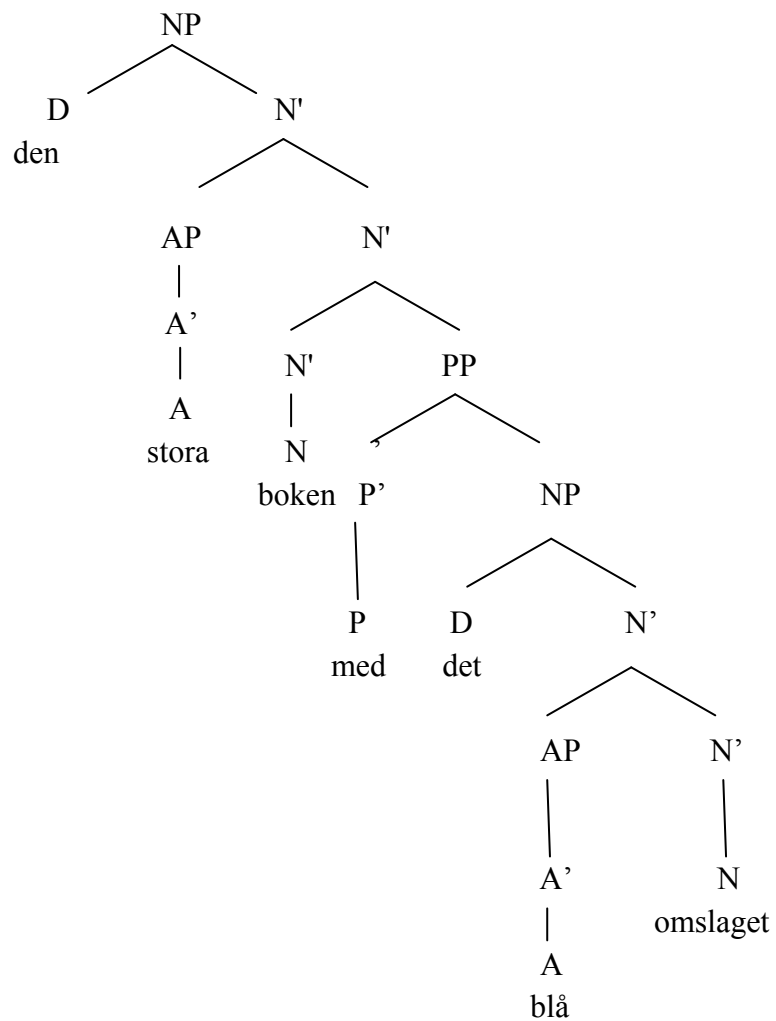
Figure 2. X-bar structure of a Swedish noun phrase .

The parts that are left out in the elliptical sentences above correspond to the N'-levels.

The proposed structure in figure 1 above, however, also faces empirical problems, for example how to account for the genitive *s*. Consider the following sentences:

5) Kungen av Danmarks karameller.
   'The King of Denmark's sweets'.

6) *Kungens av Danmark karameller.
   '*The King's of Denmark sweets'.

The genitive *s* seems not to be a suffix of the noun, but rather to cliticize to the entire NP. To what category does *s* belong? Consider the following English sentences:

7) The man's hat
8) *The man's the hat

We know that the English word *the* is a determiner. One possible explanation for the fact that the *s* cannot appear together with a determiner is that *s* is also a determiner. In that case, the two determiners are in complementary distribution with each other, i.e. they cannot appear together because they are instances of the same thing (syntactically speaking).[5] We may thus assume that the genitive *s* is a determiner as well. Does this hold true in Swedish too? Consider the following sentences:

9) Mannens hatt
10) *Mannens hatten

We do not need an additional explanation for the Swedish data. We only have to assume that the structure of the phrase at some point in the derivation resembles the structure of the English phrase.

According to the structure outlined in figure 2 the determiner *s* and the noun *hat* should be modelled as follows:

Figure 3. The old NP analysis.

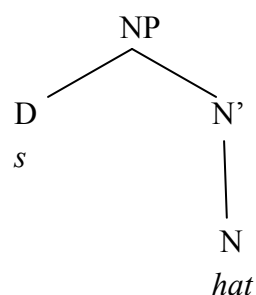The problem is that the structure does not provide any place for the rest of the NP (*the man*). This problem is solved if we assume that the

---

[5] Compare with the Swedish definite articles *en* and *ett*; these words cannot appear together because they are tokens of the same type. My point is not that the relation between *s* and *the* is identical with this example but that it is similar.

determiner is a head in a determiner phrase (DP) instead of a specifier in a noun phrase. The rest of the words that were previously conceived of as constituting a noun phrase can now be seen as constituting the complement to the determiner head:[6]

Figure 4. The DP analysis.

2.1.2. The syntax of Swedish quantifier expressions

In constructions with both a quantifier expression and a possessive pronoun the form of the noun seems to be restricted by the possessive pronoun and not by the quantifier expression.[7]

11)   Alla mina bröder
      'All my brothers'
12)   *Alla mina bröderna
      '*All my the brothers'

---

[6] Cf Carnie 2002:143–146
[7] Cf Delsing 1993: 195–199.

Alla is compatible with both the definite and the indefinite forms of the noun, while *mina* is not. *Alla* does not appear to affect the form of the noun. This indicates that the noun and the possessive pronoun together make up a DP, and that the quantifier is situated outside this DP. The figure below illustrates the proposed structure:
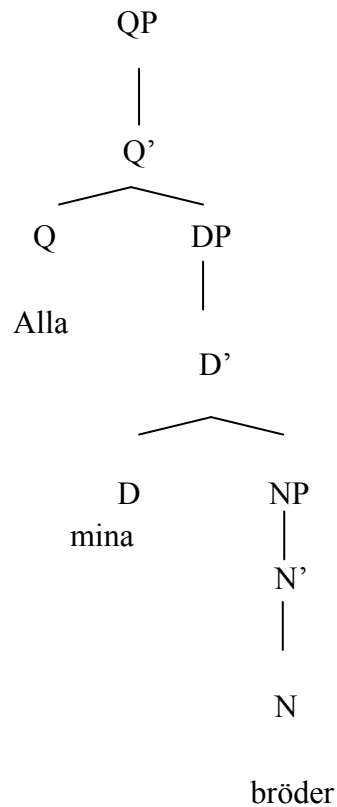
```
                        QP
                        |
                        Q'
                       /  \
                     Q      DP
                            |
                   Alla
                            D'
                           /  \
                      D        NP
                    mina        |
                               N'
                                |
                                N

                             bröder
```

Figure 5. The QP analysis.

The fact that quantifier expressions often appear separately from the DP is a further argument for the above structure. In technical terms this is called *quantifier floating*. Consider example 13:

13) Fångarna har alla dött
     'The prisoners have all died'.

The quantifier *alla* modifies the DP *fångarna* in the above sentence. This indicates that they form a constituent at some point in the derivation.
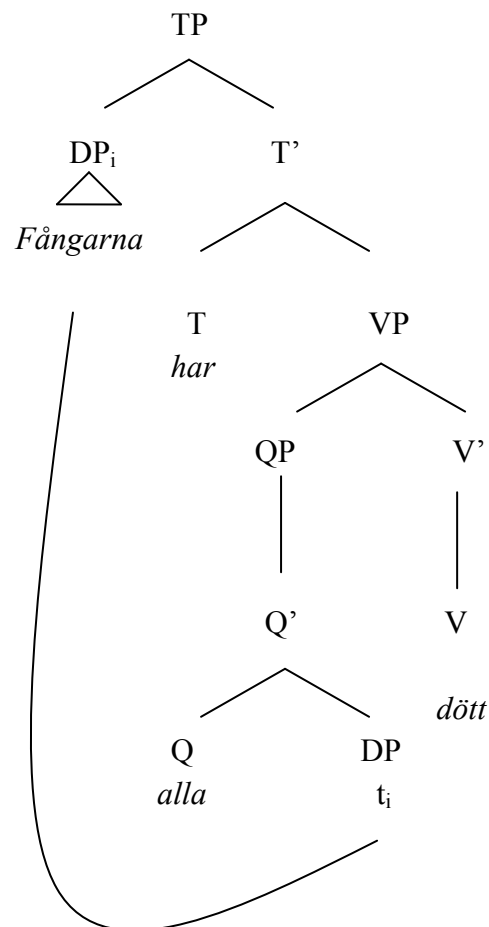
Figure 6. Quantifier floating.

The DP *fångarna* is moved from the complement of Q to spec-TP (as indicated by the drawn line).

2.2. The semantics of quantification

Our everyday conversations are constructed against a common backdrop model of universe of discourse. If we discuss details in a dissertation, for instance, the universe of discourse is the whole dissertation.[8] When we speak about whether or not the unrealistic pronunciation of words in Ingmar Bergman's film *The Seventh Seal* disturbs the overall impression of the film or not, the universe of discourse is the film, or perhaps

---

[8] Or more exactly: all "objects" in the dissertation; this is, however, a distinction that is not relevant here.

Ingmar Bergman's entire body of work. Without a common universe of discourse we would have serious communication problems. Let us call the universe of discourse M.

Nouns denote sets in the universe of discourse; *dogs* denote the relevant set of dogs, etc. Quantifiers do not denote sets; quantifiers denote relations between sets. Consider this sentence:

14) Alla hundar är hungriga
    'All dogs are hungry'

The quantifier in the sentence above expresses a binary relation between two sets. More precisely, the relation is the subset relation. The sentence above says that the set of all dogs (in M) is a subset of the set of all hungry things (in M). The subset relation is illustrated in the figure below. Set A contains all dogs in M and set B contains all hungry things in M:
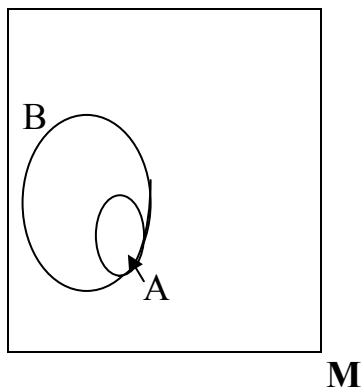

M

Figure 7. The subset relation.

One very important characteristic of this kind of quantifier is context insensitivity. Regardless of subject matter, the meaning of the quantifier is exactly the same. Consider the following examples taken from Westerståhl and Peters (2006):

15) All cats like milk.
16) All electrons have negative charge.
17) All natural numbers have a successor.
18) All twins like each other.

Westerståhl and Peters (2006) explain:

> The meaning of *all* has nothing to do with cats or electrons or numbers or twins (…) *It simply stands for the inclusion relation, regardless of*

what we happen to be talking about (Westerståhl and Peters 2006: 55, italics in the original).

Other quantifier expressions, such as *some* and *most*, or the Swedish *några* and *de flesta*, denote other relations between sets than the one described above. The quantifier 'some' in *Some students are tired* ('Some A is B') denotes the relation that holds between the set of students A and the set of tired things B iff there are elements in the intersection of A and B, i.e. some students are tired students.
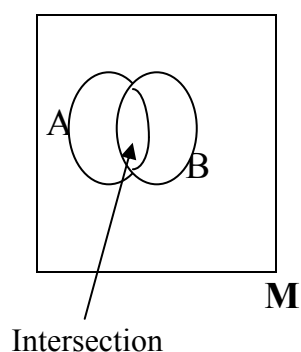

Intersection

Figure 8. The intersection relation

In *Most students are tired* ('most As are B') the quantifier contributes to the meaning by stating that the part of A that is in B (the intersection between A and B) is larger than the part of A that is outside the intersection.

2.2.2. The semantics of alla

In constructions where a noun follows the quantifier expression *alla* there are several possible interpretations. First there is the distributive/collective-distinction. Consider the sentences below (cited from SAG 2:376):

19) Alla lammen väger circa 30 kilo.
     'All the lambs weigh approximately 30 kilos'.

20) Alla lammen väger circa 150 kg.
     'All the lambs weigh approximately 150 kilos'.

In (19) the **distributive** interpretation implies that what is said is true about every separate referent in the set. In (20) the **collective**

interpretation implies that what is said is true about the referents considered as a group.[9]

Second, there is the distinction between generic reference/specific reference.[10] Consider these sentences:

21)   Alla tigrar är randiga.
      'All tigers are striped'.

22)   Tigrar är randiga.
      'Tigers are striped'.

23)   Alla tigrarna är randiga.
      'All the tigers are striped'.

There are two possible interpretations of (21): generic and specific. In the generic interpretation the noun refers to literally everybody/everything that can be denoted by it. In this interpretation (21) is synonymous with (22). In the specific interpretation the noun refers to a specific set, eg. the tigers in a specific zoo.

The specific interpretation is mandatory when the noun has the definite form as in (23). There is thus no possible interpretation in which (23) and (22) are synonymous.

The generic/specific-distinction is not connected to the syntax of the sentence in any straightforward way. The distinction seems, instead, to be contextually determined.

2.3. To which part of speech does alla belong?

SAG defines *alla* as a *pronoun of quantity* ("kvantitetspronomen"). More specifically *alla* belongs to a subclass of pronouns of quantity that is called *pronouns of totality* ("totalitetspronomen"). The reasons for defining *alla* as a pronoun is that it functions as an attribute or head in noun phrases but lacks both the categorizing semantics identified with

---

[9] Of course it is possible to interpret (19) and (20) the other way around, but it is not likely.

[10] The generic/specific properties can in some cases be seen as semantic properties of the construction "*alla* N", eg. in "Alla tigrar" ('All tigers') and not just of *alla*. When the subject referent is referred to by *alla*, such as in *Alla var glada* ('Everybody was happy'), it is reasonable to speak about *alla* as generic or specific. Below, I use the terms generic and specific about *alla* in general.

nouns and the property assigning semantics identified with adjectives. The semantics of pronouns is different:

> The pronoun indicates how the referent is to be identified (or not identified) in its context or characterises the signified with regard to quantity or number. The descriptive content is, however, thin. (SAG 2:236, my translation)

However, there are reasons to adopt a different analysis. First, the syntactic analysis for which I argue in section 2.1 above does not give the quantifier expression two syntactic possibilities (attribute and head) but only one (the quantifier expression always heads its own projection). This holds true both for expressions in which SAG would define *alla* as an attribute, eg. *Alla barn*, and for expressions in which SAG would define *alla* as a head, eg. *Alla sover*. Thus the analysis outlined above is in this respect simpler than SAG's analysis.

Second, the semantics of *alla* differs enormously from the semantics of typical pronouns such as *han* and *jag* ('he' and 'I'). The extension of *jag*, for example, is as context sensitive as a word can be; it can be (literally) anyone. But this is not the case with *alla*. The meaning of *alla* is context independent.

Third, quantifier expressions do not refer to individual referents or even properties of individual referents.[11] Quantifier expressions refer to properties of *sets* of individuals. Let me illustrate this with an example. If you have a group of cats in front of you and you say something about them using an adjective, eg. *De tre katterna är bruna* ('The three cats are brown'), the adjective refers to a visible property of the cats, eg. their brownness. But the reference of the quantifier expression, the numeral *tre*, is of a totally different kind. It refers to a property of the group of cats, a property of the set. And the same is true of *alla*.

There is no consensus among scholars as to whether quantifier expressions constitute a separate syntactic class or should be treated as determiners (cf Radford 2004:41). One argument for treating quantifier expressions as a separate syntactic class instead of as a subclass of determiners is that quantifier expressions and determiners can appear together (this holds true for both Swedish and English):

24) **All the** servile courtiers pandered to **the every** witless whim of King Kostas of Kostalotte. (Radford 2004:44)

---

[11] Cf. SAG 2:367 for a totally different analysis.

25) **Alla de** galna studenterna beställde mer öl än väntat.
    'All the crazy students ordered more beer than was expected'

I conclude that it is reasonable to treat Swedish quantifier expressions such as *alla* as a separate part of speech with the label Q.

3. Method

In order to study Swedish speaking children's use and interpretation of quantifier expressions, I first collected a small body of data. I collected my data in two steps. First I used two corpora: *Richthoff's Corpus* and the GSLC. The data in *Richthoff's Corpus* is divided into transcription files, documenting the interaction between the children and their parents/grandparents, and a lexicon file, listing the words that the children use. The data I show below from *Richthoff's Corpus* was collected by first manually searching the lexicon file and then the relevant transcription files. I then searched the GSLC corpus for quantitative results on adults' use of quantifier expressions.

Second, I carried out observations at the preschool Nova in Göteborg. In the observation at the preschool, my aim was to study the children's uses of *alla* and *varje*. I also observed the teacher's uses of *alla* and *varje* in conversations with children. The staff told me that they often read books aloud to the children. Therefore I looked through the children's books at the preschool and noted the use of *alla* and *varje* in them.

The interviews with the preschool teachers during the observation were a very important part of my collection of data. I asked them about their experiences of children's use of *alla* and *varje*. Children's problems with these words were familiar to them.

4. Results

In this section I address two important questions and a few associated questions. The first main question and its corollary questions are: **which quantifier expressions do Swedish speaking children use**? Is their usage different from adults' usage? **How** do children use the quantifier expressions? How do adults use quantifier expressions in speech directed to children?

The second main question and its corollary questions are: **how do Swedish speaking children interpret quantifiers?** There are different

ways of interpreting quantifiers, but do the children use the range of possibilities? When do they start using the different ones?

Below, I present the answers to these questions suggested by the data. As mentioned above, my primary focus is the quantifier expression *alla*. My purpose in this section is thus to answer the questions above with reference to *alla*.

4.1. Which quantifier expressions do children use?

My findings from my investigation of *Richthoff's Corpus* and the GSLC are presented in the table below.[12] The results are ordered according to the frequency of the data from *Richthoff's Corpus*.[13]

TABLE 1. *Frequency of quantifier expressions in two corpora*

Quantifier expression	Richthoff's Corpus (152, 065 words)		GSLC (1, 416, 248 words)	
*ingen (*including *inget and inga)* 'no'	2,4 $\%_{00}$	(369)	1.8 $\%_{00}$	(2499)
*någon (*including *något and några)*[14] 'some'	1.2 $\%_{00}$	(186)	1.0 $\%_{00}$	(1436)
alla 'all'	0.9 $\%_{00}$	(145)	2.0 $\%_{00}$	(2828)
många 'many'	0.8 $\%_{00}$	(120)	0.8 $\%_{00}$	(1161)
båda (including *bägge)* 'both'	0.2 $\%_{00}$	(26)	0.2 $\%_{00}$	(236)
allihop 'everybody'	0.1 $\%_{00}$	(18)	0.1 $\%_{00}$	(92)
varje 'every'	0.0 $\%_{00}$		0.3 $\%_{00}$	(433)

[12] As a native speaker of Swedish, I assume that these quantifier expressions are the most common or among the most common quantifier expressions in Swedish. My intuitions are supported by Westerståhl and Peters (2006), who exemplify quantification in Swedish by showing precisely these quantifier expressions.

[13] I have only counted the children's use. There are 152,065 words, *uttered by the children*, in Richthoff's corpus.

[14] See appendix 1 for more details.

de flesta 'most'	0.0 %$_{00}$		0.01 %$_{00}$	(12)
var och en 'each'	0.0 %$_{00}$		0.01 %$_{00}$	(8)

The table shows that there are similarities between the children's uses and the adults' uses. *Någon*, *många*, *båda* and *allihop* are used with approximately the same frequency in *Richthoff's Corpus* and the GSLC. This is evidence that Swedish speaking children use quantifier expressions. Therefore, if they have problems with using quantifier expressions, it is probably not because the words themselves are unfamiliar to them.

Note, however, that *alla* is approximately twice as frequent in the GSLC. This supports my initial assumption that children may have problems with this expression. Other interesting results are the children's use of *ingen* and their use of *någon* – they use these expressions more often than the adults.

The children do not use *varje*, *de flesta* and *var och en*. The absence of *varje* and *var och en* might be due to difficulties in handling distributive meaning. On the other hand, they do use *alla* with distributive meaning:

26) Preschool child: Alla kan inte vara bäbis
                    'Everybody cannot be a baby'.

One possible explanation for the absence of *de flesta* might be that this quantifier expression is cognitively more difficult to handle than the others; it involves the concept of 'majority', a concept not present in the meanings of the other expressions (see 2.2).

4.1.1. In which constructions does the quantifier expression alla *occur*?

I have categorized the children's uses of *alla* in *Richthoff's Corpus* on the basis of construction type.[15] In the table below I present the structure of the construction to the left and the number of instances of it to the right. Below the description of construction structure I show an instance of it. The file name in brackets shows from which file in the

---

[15] See appendix 2 for a more detailed presentation of the syntactic structure of the constructions.

corpus the instance was taken. I have preserved the transcription from the corpus.[16]

TABLE 2. *The children's uses of* alla *in Richthoff's Corpus*

Construction	Instances (Total: 145)
1) **Head + indefinite DP as complement** Bella: all-a frukt-er där. 　　*Alla frukter där* (BEL 33.25.cha) 'All fruits over there'.	18
2) **Head + definite DP as complement** Anton: nu kacka ann-a ban-e gå häm. 　　*Nu ska alla barnen gå hem* (ANT 42.29. cha) 'Now all the children has to go home'.	42
3) **Head** Bella: all-a sova 　　*Alla　sover* (BEL2703.cha) 'Everyone sleeps'.	45
4) **Head + AP or NumP** Bella: All-a få å får [?] dä. 　　*Alla två och två där* 　　*All　two by two there* (BEL2723.cha) 'All pairs over there'.	6
5) **Head + PRN** Bella: all-a-na <dä> [>] . 　　*Alla de där.* 　　*All them there* (BEL2703.cha) 'All of them over there'.	17
6) **Head + PRN + N** Anton: *pakena ann-a chin-a bin-a dä hå* .	2

---

[16] As far I can see it is not relevant here. But the interpretation of the children's utterances might in some cases hinge on the transcription.

parkera alla sina bilar där får *park all their cars there may* 'De får parkera alla sina bilar där' 'They may park all their cars there'.	
Other: Bella: mamma sen ät-e **vi all-a** upp all-a kak-or . *Mamma sen äter vi alla upp alla kakor* *Mother then eat we all up all cookies* (BEL40_11.cha) 'Mother, then we all finish all of the cookies'.	15

The children in *Richthoff's Corpus* seem to handle the syntax of constructions with *alla* on a general level. However, they do not use *varje* at all.

The same seems to be true of the children at the preschool (I have categorized their use of construction in the same way):

TABLE 3. *The children's use of* alla *at the preschool*

Construction[17]	Instances (Total: 21)
1) **Head + indefinite DP as complement** Vi tog alla meloner. 'We took all melons'.	5
2) **Head + definite DP as complement** Nu äter vi upp alla godisen. 'Now we finish all candy'.	1
3) **Head** Nam, nam, jag äter upp alla. 'Yum, yum now we finish them all'.	12
Other: Jag tar dom alla röda. *I take the all red* 'I take all the red ones'.	3

The children at the preschool used fewer constructions. But the constructions they used are the most frequent in *Richthoff's corpus*. This

---

[17] See appendix 2 for a more detailed representation of the structure.

may therefore only be a result of the small amount of data I have on the preschool children's use.

Like in Richthoff's corpus, the children at the preschool did not use the quantifier expression *varje*.

4.1.2. How is alla *used in speech directed to children?*

The adults use *alla* in the following constructions in *Richthoff's Corpus*:

TABLE 4. *The adults' uses of* alla *in Richthoff's corpus*

Construction[18]	Instances (Total: 141)
1) **Head + indefinite DP as complement** Mother: å all-a katt-er också (BEL33_00.cha) 'And all cats as well'.	17
2) **Head + definite DP as complement** Father: du ska vi samla i#hop all-a kanin-er-na å sätta i dom i bur-en? (BEL2703.cha) ' (You), shall we collect all rabbits and put them in the cage?'.	60
3) **Head** Grandmother: å all-a [!] titta-r för#skräck-t-a på hund-en som e så smuts-i (TEA40_19.cha) 'And everybody looks horrified at the dog that is so dirty'.	27
4) **Head + AP or NumP** Mother: all-a två *All two* (BEL2723.cha) 'Both'.	5
5) **Head + PRN** Father: <så lägg-er vi ut> [<] all-a dom här. 'Then we put out all these here'.	9
6)**Head + PRN + N**	4

---

[18] See appendix 2 for a more detailed representation of the structure.

Mother: då kan vi stoppa in all-a vår-a möbl-er där i . 'Then we can put all of our furniture in there'	
7) **Head + CP** Mother::då kanske han träffa-r all-a som han ska se" (BEL2904.cha) 'Then maybe he will meet everyone that he has to see'.	4
8) **Head + Adj + N** Mother: komm-er han te all-a snäll-a barn ? 'Does he come to all good children?'.	6
Other: "Mother: all-a dom gubb-ar-na där " (BEL31.07) 'All the old men over there'.	9

The adults in *Richthoff's corpus* use two constructions that the children do not use: construction 7 (Head + CP) and construction 8 (Head + Adj + N). The finding that the children do not use construction 8 is discussed in section 5 below (see section 5.2).

The adults in Richthoff's corpus never use *varje*.

TABLE 5. *The adults' uses of* alla *at the preschool*.

Construction[19]	Instances (Total: 10)
1) **Head + indefinite DP as complement** Alla händer säger klapp, klapp, klapp 'All hands say clap, clap, clap'	3
2) **Head + definite DP as complement** Har vi fått in alla madrasserna nu. 'Have we got all the mattresses in now'	1
3) **Head** Är alla hästar? 'Are you all horses?'	5
Other: Alla i bussen åker fram och tillbaka	1

---

[19] See appendix 2 for a more detailed representation of the structure.

'Everyone in the bus rides back and forth'	

The staff at the preschool used only the three constructions that are most common in the other tables. This is probably attributable to the small amount of data (which, however, indicates that constructions 1, 2 and 3 are the most common constructions among both children and adults).

The staff at the preschool used *varje* twice:

27) Teacher: Varje dag och hela dan
             'Every day and the whole day'.

28) Teacher: En slev på varje bord.
             'One ladle on every table'.

Below I show the findings from the investigation of children's books at the preschool.[20] I searched through 24 children's books. *Alla* was used in 19 of them.

TABLE 6. *The use of* alla *in children's books at the preschool.*

Construction[21]	Instances (Total: 23)
1) **Head + indefinite DP as complement** Så är alla bäbisar, säger mamma, men de växer fort" (*Busiga Bebben kommer hem*, page 4) 'All babies are like that, mamma says, but they grow fast'	4
2) **Head + definite DP as complement** Ska det vara nödvändigt att putsa alla äggen nu?, sa katten irriterat. (*Pannkakstårtan*, page 4) 'Is it really necessary to polish all the eggs now, the cat asked irritatedly .	5
3) **Head** Alla tittade på Grodan (*Grodan är modig*, page 26)	8

---

[20] See appendix 3 for a list of the books at the preschool.

[21] See appendix 2 for a more detailed representation of the structure.

'Everybody looked at the Frog'.	
5) **Head + PRN** Hon är vaken hela nätterna när alla andra vill sova (*Busiga Bebben kommer hem*, page 5) 'She's awake all night when everybody else wants to sleep'	1
6) **Head + PRN + N** Har han bränt upp alla dina kläder? (*Billy och grodan*, sid 6) 'Has he burnt up all your clothes?'	3
7) **Head + CP** Bäst att ringa våra vänner, ring till alla som vi känner (*Rut och Knut lagar mat*, page 18). 'We'd better call our friends, call everybody we know'	1
Other: Från den dagen ansåg alla i trakten att Pettson hade blivit tokig. (*Pannkakstårtan*, page 20) 'From that day on everybody in the neighbourhood regarded Pettson as mad'.	1

Varje is used a few times in the books:

29) Varje gång pappa ska rapa henne efter maten kräks hon på hans skjorta.
      'Every time daddy burps her after she eats, she throws up on his shirt'.
      (*Busiga Bebben kommer hem.* Svensson 1995).

30) Castro lägger en krukskärva över hålet i botten på varje kruka, så att inte jorden ska rinna ut" (*Castor odlar* Klinting 1997).
      'Castro puts a shard over the hole in the bottom of every pot, so the earth won't run out'.

4.1.3. Syntactically novel uses

During the observation at the preschool one child used *alla* in a syntactically unusual manner. The child let a definite article precede *alla*:

31)   Situation: The children are putting their toys in order
                        Child: Jag tar dom alla röda
                             I take the all read
                        'I take them all the red ones'

The same syntactic pattern is found in *Richthoff's corpus*. Bella uses it when speaking about dogs (she was aged 33 months at the time of the utterance):

32)   Bella: do all-a hund-ar . (*De alla hundar)*
                  The all dogs
                  'All the dogs'
                  (File: BEL33_00.cha)

It is possible to interpret Bella's utterance as *De är alla hundar* ('They are all dogs'). However, the context makes that interpretation unlikely (*Audrey* is the name of their dog):

33)   Mother: har Audrey nåra händer ?
                   'does Audrey have hands?'
        Bella: nej
                   'No'
        Mother: va har hon för nåt då ?
                   'so, what does she have?'
        Bella: dom ha-x tass-ar .
                   'they have paws'
        Mother: dom har ju tass-ar .
                   'they have paws, right'
        Bella: do alla hundar .
                   the all   dogs
                   'all the dogs'
        Mother: å alla katter också .
                   'and all cats too'

Anton uses the same pattern twice, at the age of 47 months:

34) Anton: nu # å ka gon ann-a barn-en titta .
    nu var ska dom alla barnen sitta?
    now where will the all children sit
    'Now where will all the children sit?'
    (File: ANT47_29.cha)

35) Anton: å dom ann-a a ka gom titta
    och dom alla var ska dom sitta?
    and the all where shall they sit?
    'And where will all of them sit?'
    (File: ANT47_29.cha)

I have controlled that Anton's *ann-a* really should be interpreted as *alla* and not as *andra,* which is a likely interpretation as well. In the file *Ant_45.chat* Anton says *ann-a* in another context where it is obvious that the target word is *alla*:

36) Mother: hej all-a barn # få-r du säja !
    'You should say hello all children!'
 Anton: hej ann-a ban .
    'Hello all children'

Below I refer to this order, **definite article + alla**, as *the syntactic switch*. I discuss this in section 5 below (see 5.2 and 5.3).

4.2. How do children interpret **alla***?*

My aim for the generic-specific investigation was to determine if and when the children start using generic reference (see section 2.2.2). I investigated the 145 instances of *alla* in *Richthoff's corpus* in their contexts. First I determined the universe of discourse (see section 2.2), and then I determined whether the interpretation was generic or specific.

 The notion of universe of discourse is used in well determined ways in logic and formal semantics. However, when using it to analyse data from conversations between children and their parents/grandparents, it was hard to apply the concept in a straightforward and objective manner. The fact that I was investigating child language made the task even more complex. Children do not always follow adults' conversational conventions and sometimes an utterance is impossible to interpret. However, I succeeded in determining whether *alla* was used generically or specifically in almost all of the instances. Below I present

some of my findings. I then discuss particular examples, some of them problematic to interpret.

TABLE 7. *Specific and generic uses of* alla.

Specific	131 (90%)
Generic	6 (4%)
Unclear	8 (6%)
Total	145

TABLE 8. *Individual children's use of specific and generic utterances*

	Anton	Bella	Harry	Tea
Specific	11	41	20	59
Generic		4	1	
Unclear		2	1	3
Total	11	47	22	62

TABLE 9. *First use and first generic use of* alla.[22]

	Anton	Bella	Harry	Tea
First use of *alla*	40	24	27	30
First generic use of *alla*		33	46	

The use of the generic type is clearly less common than the use of the specific type. Harry's utterance below is of a typical specific type:

37)   **File:** HAR33_08.cha
      Situation: Harry and his mother play with toy cars
      Utterance:
      Harry::   all-a få-r [/] få-r pass hä:: .
            Alla får plats här.
            'There is room for everyone here'
      Universe of discourse: The toy cars

Tea produces only specific types (as far as I can see). This is an instance of her specific types:

---

[22] The numbers in table 8 indicate the age in months.

38) **File:** TEA36_05.cha
 Situation: Tea and her mother are looking at the pictures in a book.
 Utterance:
 Tea: där bo-r all-a dom .
   där bor alla dom.
   There live all them.
   'There they all live'
 Universe of discourse: The imaginary world of the book.

The next utterance is also of the specific type:

39) **File**: BEL2703.cha
 Situation: Bella and her father are playing a game.
 Utterance:
 Bella: all-a-na <dä> [>] .
   Alla dom där.
   All them there.
   'All of them there'.
 Universe of discourse: The pictures on the table and the game.

This is an example of Anton's specific utterances:[23]

40) **File:** ANT 42.29. cha
 Situation: Anton and his mother are playing with lego.
 Utterance:
 Anton: <xxx> [>] nu kacka ann-a ban-e gå häm .
    Nu ska alla barnen gå hem.
    'Now all the children are going to go home'
 Universe of disourse: The imaginary circus Anton pretends to be in.

Bella produces some generic utterances:

41) **File:** BEL 3300
 Situation: Bella is eating meringues while talking to her mother and looking at the pictures in a book.
 Utterance:
 Mother: å morfars katt har också tassar .
   'and grandfather's cat has paws tool'
 Bella: alla a-x tassa .

---

[23] Although the universe of discourse is a fictional set of children in Anton's imaginary circus, it is still specific.

Alla har tassar.
'They all have paws'
Universe of discourse: All cats and dogs.

My interpretation of the above utterance is supported by Bella's mother's utterance presented above as well as the general discourse at the time of the utterance: they are talking about how Bella would look if she were a dog and what kind of charactereristic features dogs and cats have. However, it was difficult to determine exactly what the universe of discourse is in this context. Bella's contribution to the conversation is quite unexpected; she seems to suddenly be talking about all cats and dogs inspite the fact that this is not the universe of discourse for the whole conversation.

Harry's first use of *alla* with generic reference appears later than the other children's:

42) **File:** HAR47_20.cha
     Situation: Harry is having porridge in the kitchen.
     Utterance: *Harry: all-a ha-de mata-s .
                                alla hade matats.
                                'everyone had been fed'
     *Grandmother:ja tänk om man ha-de haf-t den servic-en .
                                'Yes, just think if we had had that service'
     Universe of discourse: All human beings.

The most likely interpretation here is that Harry's utterance is intended to refer to all human beings. But as in Bella's generic utterance above, this is not the basic universe of discourse in the child's and the adult's conversation. The utterance could be paraphrased as *Tänk om alla hade blivit matade* ('Just imagine everybody being fed'). This seems to be how Harry's grandmother interprets his utterance.

4.2.1. Comments on the children's interpretations

Anton does not produce any generic utterances. His first use of *alla* is at 40 months, which is very late. These facts support Richthoff's (2000) observation that Anton's general language development is slower than the other children's. The finding regarding Bella's use supports Richthoff's (2000) observations as well; her general language development is quicker than the other children's.

Four of Tea's uses were impossible to interpret; we do not know whether or not she uses the generic type. Her general language development was normal (Richthoff 2000:14–16) and proceeded in the same tempo as Harry's. Perhaps some of her instances are generic, but we cannot be certain.

The generic/specific investigation was difficult to carry out. This is an interesting fact in itself; children at this age simply do not take part in conversations in easily described ways. Perhaps we need new techniques and tools to analyse children's conversational strategies.

4.2.2. Semantically interesting examples

During the observation, when one of the children at the preschool was looking at pictures in a folder I asked her if the people in the pictures were her family members. She answered me as follows:

43) Situation: A child shows me her folder of photographs.
     Observer: Är det din familj?
                'Is that your family?'
     Child: Nej det är bara alla.
                'No, it's just all'

This instance suggests that the child's concept of the word *alla* is different from that of adults. (I call the child's answer above the "*just all*" answer). This is confirmed by the staff at the preschool who told me that they often (independently of each other) had experienced the situation I described in the introduction, repeated here in 44 (I call this problem the *circle time inference problem*):

44) Teacher: Idag ska alla gå ut.
              'Today everybody's going to go outside'
     Child: Får jag också gå ut?
              'May I go outside as well?'

This indicates that children have difficulties with the semantics of *alla*. In section 5 below I suggest an explanation for this and for some of the other data presented in this section.

5. Discussion

Below, I discuss four interesting aspects of children's use and inter-
pretation of *alla*. First, I discuss the syntactic problem some children
appear to have with *alla* (*the syntactic switch*, see 4.1.3). Second, as I
mention in 4.2.2, some children use *alla* in a way that is hard to interpret
for adults. I discuss the *"just all"* answer and the *circle time inference
problem* below (see 4.2.2). Finally, I discuss the Inhelder & Piaget
experiment mentioned in the introduction and relate it to my data and
discussion.[24]

5.1. Theory of mind

As mentioned in section 1.4 the cognitive abilities known as **theory of
mind** is not developed in infants, but emerges at approximately 36
months of age (Brinck 2006:2).[25] Theory of mind involves the ability to
attribute beliefs and desires to other agents and to "generate higher-
order beliefs about them (..) for drawing propositional inferences about
their mental states, and for counterfactual reasoning about their motives
and preferences" (Brinck 2006:2).

The absence of a developed theory of mind is one possible ex-
planation for the circle-time inference problem. The absence of a theory
of mind excludes the possibility of having a third person perspective on
the situation. Therefore the child presumably does not include herself in
the set denoted by *alla*. Most likely the child understands *alla* in the
same way as adults understand *alla dom* ('all of them'). The child seems
to understand *alla* in a deictical and (compared with adults) less abstract
manner.

The child's problem with taking a third-person perspective on the
situation prevents her from shifting perspective on the situation. When
someone says *alla* the child then presumably understands this as we
understand *alla dom* ('all of them'), but from **her perspective**. Thus, if
someone says that *alla* ('all') are allowed to do this or that, the child will
infer that this hold for *alla dom*, seen from her perspective. In a circle

---

[24] I am not aware of any study where the Inhelder & Piaget experiment is carried
out with Swedish speaking children. However, it seems likely that Swedish speaking
children would answer in the same way (both English-speaking and Korean-
speaking children do, cf Kang 2001).

[25] Cf. Bloom 2000:55-89

time context the child infers that *alla* holds for the set she can point out from her perspective.

The *"just all"* answer can be explained in a similar manner. [26] If we accept that *alla* is understood in the way outlined above, i.e. as synonymous with *alla dom* (seen from the child's perspective), the *just all* answer seems to be an instance of that use but with a misunderstanding of the subset relation. Thus, the child understands *alla* as denoting a set that does not include her and that is seen from her perspective, but with no subset relation. What kind of set is that? It is just a random set. The child points to the picture and says that it is just a random set; contextually defined as a random set of people.

Moreover, the data in table 9 indicate that the emergence of the generic use of *alla* takes place during the same period or at least not before the emergence of theory of mind (in my data the children use the generic type for the first time at the age of 33 months and 46 months). I do not know whether or not this emergence is the result of the same cognitive process (probably not). My findings, however, indicate that several important developments in children's ability to use and understand language take place around the age of three.

5.2. The syntactic switch

One possible reason for the syntactic switch is that the syntactic category Q is not fully developed in children's language. They most likely have it (see section 4.1), but this does not prevent us from assuming that they may sometimes have problems with it. How do they misinterpret *alla*? Let us take a look at the syntactic switch once again:

31) Situation: The children are putting their toys in order
           Child: Jag tar dom alla röda
                   I   take the all red
                   'I take them all the red ones'

A Q might sometimes be interpreted as a D. But this does not seem to be the case here. The child rather seems to interpret *alla* as a modifier of the noun. This suggestion is supported by the grammatical obscurity in Swedish when it comes to the quantifier expression *många* ('many').

---

[26] It is possible that the answer may be a result of a misinterpretation of the word *bara* ('just'). However, since *alla* is under consideration here, I only explore the possibility of explaining it as a result of the interpretation of *alla*.

The syntax of *många* resembles the syntax of adjectives. Consider the following two phrases:

45) De snälla hundarna
     'The nice dogs'
46)   De många hundarna
     'The many dogs'
47) *De alla hundarna
     '*The all dogs'

47 is ungrammatical but 46 is grammatical. *Många* is placed between the determiner and the noun, just like adjectives are. Moreover, *många* can be compared:[27]

48) Många – fler – flest
     'many – more – most'

Finally, *många* may take the same sort of adjunct that is normally combined with adjectives, i.e. *väldigt* ('very'). It is thus very plausible that a child with a less than fully developed Q-category sometimes interprets the Q as a modifier:
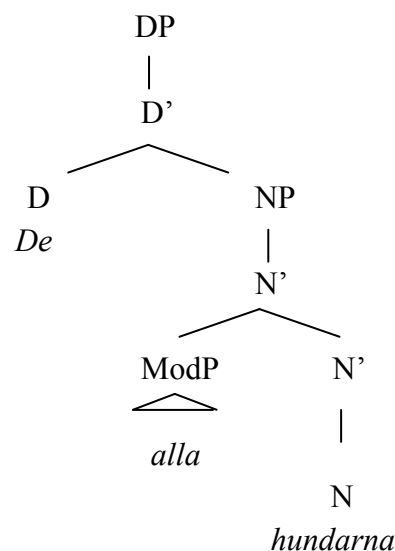

Figure 9. Possible analysis of the children's syntax.

---

[27] This is the main reason for why *många* is considered to be an *adjectival pronoun* in traditional grammars such as SAG.

This explanation is supported by the findings regarding children's construction use. They do not use construction 8, Head + Adj + N at all (see section 4.1). Perhaps they do not use it because of the unclear status of Q.

The analysis above fits well with Kang's (2001) analysis of English and Korean children's problems with quantification. I describe Kang's (2001) analysis below.

5.3. The event quantification hypothesis

The explanation suggested above fits nicely with one of the explanations that have been proposed for the findings from the Piaget and Inhelder experiment (cf. Geurtz 2003). Kang (2001) presents results from an experiment with children where a different picture is used than the one Piaget and Inhelder (1959) use. In Kang's (2001) experiment, instead of showing the children a picture with squares and circles, the children are shown a picture with boys riding on elephants. The picture is of four elephants and three boys, with the three boys each sitting on an elephant:
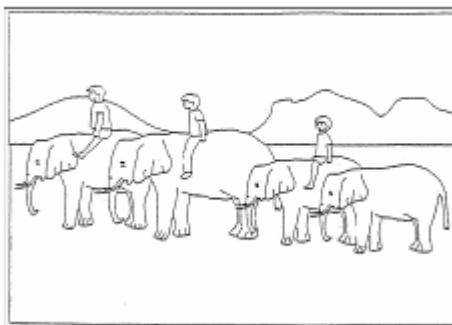

Figure 10. Experiment picture.

The researcher asks *Is every boy riding an elephant?* In general adults answer *yes* to the question whereas many children answer *no* and point out the elephant with no rider as the justification for their answer.

Kang (2001) argues that the children's answers can be explained in terms of a different syntactic representation of the question than the syntactic representation of the question in adults. The account demands a few preparatory theoretical remarks.

First, according to Kang (2001) there is crosslinguistic data that indicate that children treat quantifier expressions as modifiers in NPs (a) and not as heads in QPs (b) (cf section 2.1.2 above):[28]
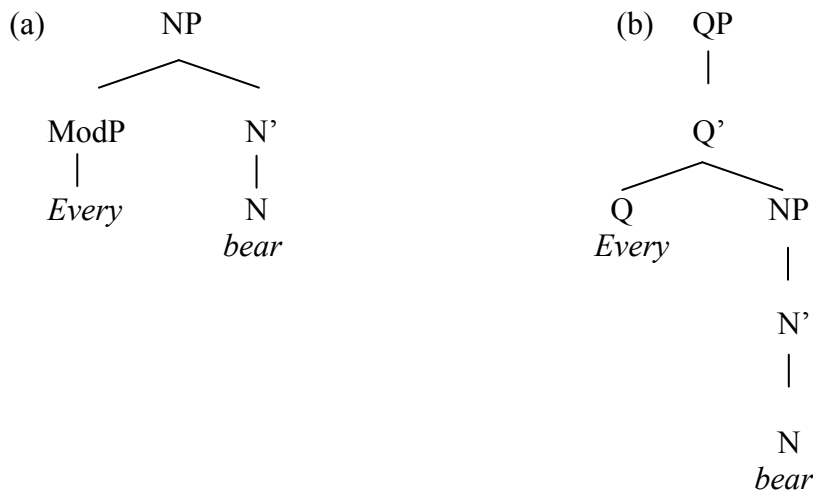
(a) NP
 ModP N'
  | |
 Every N
     bear

(b) QP
  |
  Q'
 Q NP
 Every |
    N'
    |
    N
    bear

Figure 11. Q interpreted as modifier.

Second, according to Kang (2001) Q (the quantifier expression) in (b) cannot move without moving the NP. However, it is perfectly possible to move the ModP in (a).

Third, for reasons beyond the scope of this paper to describe, Kang (2001) assumes that there are so called *focus phrases* (FP). These syntactical phrases ("projections") are pragmatically motivated and are present only in sentences that contain a focused element.

Kang (2001) argues that when a child sees the picture shown above, she takes notice of the different elements in it, such as the elephants and the boys. These objects then constitute old information at the time of the question. The child does however not expect the quantifier expression *every* to be a part of the question. Therefore the quantifier expression becomes salient for the child when uttered and she interprets it as a focused element. *Every* is therefore moved from its modifier position (ModP) to the focus phrase (FP). This movement focuses *every* in a way that is not the case if *every* is **not** moved to FP. As described above, *every* does not move to FP in adult language and hence is not a focus element. Kang (2001) then argues that children quantify over **situations** or **events** rather than over objects.

---

[28] The trees in Kang (2001) are drawn slightly differently. I have followed the instructions for tree drawing in Carnie (2003). This is, however, not at all important for the point Kang (2001) is making.

So, first the child knows that something holds for *every* event of some kind. Which events are available in the picture? The most salient event is the event boy-riding-elephant. Thus, when they are asked if **every** boy is riding a elephant they understand this question as 'for every possible boy-rides-elephant-event, is a boy riding an elephant?'. And that is not true, because there is one instance of a possible boy-rides-elephant where an elephant is not ridden by a boy.

The account in Kang (2001) seems intuitively plausible. Moreover, it assumes that children sometimes interpret Qs as modifiers, as I do in the syntactic switch explanation suggested above. It is also compatible with the explanations for the *circle time inference problem* and the *"just all"* answer suggested above (in the sense that it does not contradict them).