THE ACQUISITION OF THE WEAK-STRONG DISTINCTION: THE CASE OF THE DUTCH QUANTIFIER ALLEMAAL

Bart Hollebrandse & Erik-Jan Smits, University of Groningen

Abstract
Drozd & van Loosbroek (1999) and Geurts (2003) recently introduced the weak-strong distinction into the discussion concerning the acquisition of quantification. They predict that children will start out interpreting all quantifiers as weak ones. Our experiment was set up to test this hypothesis. Using the Truth Value Judgement Task, 39 children (aged between four and seven) and 7 adults were asked to interpret the Dutch quantifier allemaal (‘all’) in pronominal position in an existential sentence, in which allemaal gets a strictly weak reading, or in floated position, in which allemaal gets a strong reading. The strong interpretation of the quantifier is taken as co-intersective and the weak one as intersective, following Keenan (2002). Only three children behaved according to the prediction and interpreted allemaal as a weak quantifier when it is presented in a strong quantifier position. The other thirty-six children interpreted the quantifier allemaal as a strong quantifier, even when it occurs in an existential sentence. We’ll argue that, contrary to Drozd & van Loosbroek’s and Geurts’ expectation, these children do not interpret quantifiers as weak, but as strong. They do this even in constructions where the quantifier is obligatorily weak for adults. This can, however, be analyzed within Geurts’ proposal.

1. Introduction

Interpreting quantifiers requires combining information from different sources or of varying nature. One needs to cut the world up into relevant parts: to interpret (1a) one has to form the set of men and the set of runners and, depending on the quantifier, make comparisons between these two sets, their intersection, the set of men that aren’t running, etc. For instance, for (1b) one needs to compare the set of running men (which is the intersection of the set of runners and the set of men) with the set of not running men (which is the set of men minus the intersection of the set of men and the set of runners) and compare their cardinality. To interpret
(1c), on the other hand, one only needs to evaluate the intersection of the set of men and the set of runners and see if it contains ‘many’ individuals.

(1) a. QUANTIFIER men are running.
   b. Most men are running.
   c. There are many men running.
   d. Many men are running.

Fortunately for the language-user, language gives us specific clues as to how to cut up the world, and how to make these comparisons. There are lexical clues: certain quantifiers are always interpreted in the same way (most, all). There are syntactic clues: the syntactic position often helps in the interpretation of quantifiers (many), which can get a weak or a strong reading. The weak–strong distinction (the difference between (1b) and (1c) involves both lexical and syntactic knowledge. Adults know that the weak/strong distinction involves a lexical property of being strong or weak: some quantifiers are strong and others are weak. Moreover, adults know that lexically strong quantifiers are excluded from certain syntactic constructions such as the existential construction. Finally, weak quantifiers in an existential construction (1c) have to be interpreted under a weak construal, while in (1d) a strong construal is preferred.

This paper explores the first-language acquisition of a special case in Dutch: the quantifier allemaal. This quantifier is interesting because it can either be interpreted as weak or as strong, depending on its syntactic position. The literature on the acquisition of quantifiers predicts that children will start out interpreting all quantifiers as weak ones (Drozd & van Loosbroek 1999, Geurts 2003). On this hypothesis, even strong quantifiers such as most and all are predicted to be interpreted as (weak) many. Contrary to that prediction, we find that children primarily interpret allemaal as a strong quantifier, even when the syntax dictates a weak reading. Section 2 gives an elaboration on the weak-strong distinction. Section 3 discusses this distinction in the language-acquisition literature. Section 4 discusses the relevance of the weak-strong distinction in language development. Section 5 focuses on the Dutch quantifier allemaal and its relevance for this paper. Section 6 presents the experiment and section 7 discusses the results.

2. The Weak-Strong Distinction

Some quantifiers are allowed in existential there-sentences, e.g. some, several, many, whereas others are not, e.g. all, every, most (2b).
(2)  
a. There are some/many/several men that are crazy about green old-timers.
b. *There are all/every/most men that are crazy about green old-timers.

Milsark (1976) calls this the ‘weak-strong distinction’. Milsark’s distinction returns in a different form in Barwise & Cooper’s (1981) paper on Generalized Quantifier Theory. Barwise & Cooper see determiner phrases as functions which map properties of the determiner phrase onto truth values by taking the VP as its argument. Before the determiner phrase combines with the VP, the determiner combines with a common noun. However, determiners differ in the way they combine with a common noun. The relation between determiner and common noun in (3a) is a subset relation in the case of a strong quantifier, such as all. This is illustrated in (4), where A is the set of parrots and B the set of flying individuals. A weak quantifier, such as some (3b), presents an intersection relation. This is illustrated in (4), where again A is the set of parrots and B the set of flying individuals.

(3)  
a. All parrots are flying.
b. Some parrots are flying.

(4)  
All (A,B) = True iff A - A\cap B = \emptyset
To determine the truth of a sentence with a strong quantifier (3a), we have to check whether the set of parrots that are not flying is empty or not. This is the set of the set of parrots minus the intersection of the set of parrots and that of flyers (i.e. the set of non-flying parrots). If the set of parrots that are not flying is empty, the sentence is true, otherwise it is false. Set A minus the intersection of the sets A and B is important in the interpretation (highlighted part in (4)). On the other hand, to evaluate the truth of a sentence with a weak quantifier (3b), we have to consider whether the set of parrots that are flying (i.e. the intersection of the set of parrots and the set of flying objects) is empty or not. The relevant part is highlighted in (5). The sentence is only true if this set is not empty.

Barwise & Cooper characterize Milsark’s weak-strong distinction in terms of intersectivity: in order to evaluate the truth of a sentence containing a weak quantifier it suffices to inspect the intersection of the sets A and B; in the case of a sentence containing a strong quantifier this is not sufficient. Reuland & Ter Meulen (1987) put it in the following words:

“(…) for weak determiners the verification of a sentence Det N is/are Pred is based only on the intersection of the N- and Pred-interpretations, that is, information is provided by the sentence itself, whereas strong determiners require for their verification consideration of some other set (…)”

(Reuland & Ter Meulen 1987: 4)

In Keenan’s (2002) terminology the difference between strong and weak quantifiers is seen as that between, respectively, co-intersective and intersective determiners: “Co-intersective (generalized universal) Dets depend on A – B, the A’s that are not Bs, just as intersective Dets depend on A ∩ B” (Keenan 2002: 633). This definition is essentially the same as in Barwise & Cooper (1981).
3. The Weak-Strong Distinction and the Acquisition of Quantification

Since the groundbreaking work of Inhelder & Piaget (1964), the acquisition of quantification has been a topic in both psychological work dealing with cognitive development (Freeman, Sinha & Stedmon 1982, Brooks & Braine 1996), and linguistically oriented research (Roeper & de Villiers 1993, Philip 1995, Crain, Thornton, Boster, Conway, Lillo-Martin & Woodams 1996, Drozd & van Loosbroek in press, Geurts 2003, Labelle & Valois 2003, Hollebrandse 2004, Hollebrandse & Smits 2004). Children, regardless of their language, have difficulty understanding quantified sentences such as (6) in relation to picture 1.

(6) Is every girl riding a horse?

Many children aged between four and seven answer ‘no’ and point, as an explanation, to the horse not being ridden. It seems that these children want to pair up horses and girls exhaustively. This has been called the ‘exhaustive pairing answer’ or ‘spreading answer’ in the literature (Roeper & De Villiers 1993).

Drozd & van Loosbroek (1999) and Geurts (2003) analyzed the non-adult behavior of children in terms of the weak-strong distinction. The next two sections will address their proposals.

Many different analyses have been made of this observation. Roeper & De Villiers (1993) argue for an analysis according to which the child takes the
quantifier to be an adverb. The adverb has scope over the full clause and can therefore bind both variables supplied by the subject and the object. Other researchers have taken this phenomenon to be non-linguistic (Inhelder & Piaget 1964, Donaldson & Lloyd 1974, Freeman et al. 1982, Brooks & Braine 1996), and Crain et al. (1996) take the results to be an experimental artifact.

3.1 The Weak Quantifier Hypothesis (Drozd & van Loosbroek 1999)

Drozd & van Loosbroek (1999) propose that children’s difficulties in constructing the relevant sets when interpreting universally quantified sentences stem from their handling of presuppositions. According to them, children expect more horse-riding girls for (6). Drozd & van Loosbroek follow Keenan & Stavi (1986), who proposed that for the interpretation of a weak quantifier, as in (7), the number of individuals in the scope of the quantifier (tourists in (7)) is compared to the number of expected individuals (tourists on any average day).

(7) Many tourists visited the zoo today.

Furthermore, they state that children follow an interpretation proposed by Westerståhl (1985), who noticed that sentence (8) can either be interpreted as (8a) or (8b).

(8) Many Scandinavians have won the Nobel prize in literature.
   a. Many Scandinavians are winners of the Nobel prize in literature.
   b. Many winners of the Nobel prize in literature are Scandinavians.

The interpretation (8b) is even preferred. To arrive at this interpretation, one determines the proportion of the number of Scandinavian Nobel prize winners and the number of Scandinavians. This proportion is then compared to similar expected proportions of the winners from other countries.

According to Drozd & van Loosbroek (1999), children interpret all quantifiers in this way. For (6), they compare the number of horse-riding girls to the number of expected horse-riding girls. Why they should expect to see a higher frequency of horse-riding girls is not clear to us, but if they do so, then it would lead to the observed rejection of cases such as (6).

Drozd & van Loosbroek offer a reason why children interpret strong quantifiers in a Westerståhl style. Universal quantifiers carry presuppositions that restrict the domain of quantification. These domain presuppositions cannot always be handled by the child. When such a difficulty arises, children interpret universal
quantifiers as weak. According to Drozd & van Loosbroek, when “a child finds herself in a context where there are no clear clues that a presuppositional interpretation is intended, she will choose an existential interpretation for the quantifier” (Drozd & van Loosbroek 1999: 189).

3.2 Weak Processing Hypothesis (Geurts 2003)

The weak-strong distinction is also central to the approach of Geurts (2003). His analysis of children’s interpretation of quantified sentences can be summarized as a mapping problem between syntactic structure and semantic representation. Mapping of strong quantifiers is more complicated than mapping of weak quantifiers.

Contrary to Drozd & van Loosbroek’s approach to the weak-strong distinction, Geurts’ account bears crucially on the formulation of the weak-strong distinction as a distinction between quantifiers that are inherently relational (i.e. strong quantifiers) and those that are not (i.e. weak quantifiers). Compare the following sentences, containing a strong quantifier (9a) and a weak quantifier (9b).

(9) a. Most academics are absent-minded.
b. At least five academics are absent-minded.

The sentence in (9a) has the interpretation that most of all academics are absent-minded; the strong quantifier *most* is relational between the set of absent-minded academics and the set of all academics in the world. The sentence in (9b), on the other hand, means that five academics are absent-minded or even more than five. The weak quantifier is not relational with respect to any other set of academics. The only set that needs to be evaluated for its cardinality is the intersection of the set of absent-minded individuals and the set of academics. Geurts proposes (10b) as a representation of a weak quantifier in Discourse Representation Theory. This representation has a position for the quantifier itself, which is between angle brackets. The position for the nuclear scope is given between square brackets. The representation for strong quantifiers is given in (11b), which is essentially the representation of the weak construal (10b) with a position (between square brackets) for the quantifier restriction added to it.

(10) a. Fred photographed some llamas.
b. <some>[x: llamas(x), Fred photographed x]
(11)  a. Fred photographed all llamas.  
b. [x: llama(x)]<all>[Fred photographed x]

The central part of Geurts’ analysis is the idea that strong readings are harder to obtain than weak ones, because they involve a more elaborate mapping than weak readings. The point that strong readings are harder to obtain is supported, as Geurts points out, by observations from psycholinguistic research. According to Just (1970) and Meyer (1970), existential sentences are easier to process than universal sentences.

Geurts proposes that children apply a Weak Processing Strategy in their interpretation of quantifiers. This Weak Processing Strategy states that children’s non-adult-like behavior is due to a particular mapping from grammatical form onto semantic representation. Geurts illustrates this by (12) and (13).

(12) Every girl is riding a horse.

(13) [ . . . : . . . ] <every> [x, y : girl(x), horse(y), x rides y]

Children make a strong construal of (12) but apply a mapping that is consistent with a weak reading of the quantifier (13). That means that the child does not map [x: girl(x)] onto the restrictor position in (13). And therefore the quantifier does not get properly restricted. Instead, the child can pick up either horse or girl as a restriction. The mapping is driven by pragmatic reasons. Picking up horse as a restrictor leads to the spreading answer (“No, not this horse”). A proper adult mapping (strong construal and strong mapping) is given in (14a) and has [x: girl(x)] in the restrictor; (14b) represents what would be a weak construal of a strong quantifier, which is not an option for adults.

(14)  a. [x : girl(x)] <every> [y : horse(y), x rides y]  
b. <every>[x, y : girl(x), horse(y), x rides y]

The child’s representation in (13) seems odd at first glance: such a mismatch (strong construal - weak reading) does not exist in adult language. If the child ‘knows’ that she has to apply a strong construal, why would she apply a weak type of mapping? Geurts’ idea is that a weak mapping is simpler than a strong one. One may wonder how a child who applies a weak mapping becomes aware of the strong construal at some point and why he or she does not derive a ‘regular’ weak construal with a mapping consistent with weak readings ((13) vs. (14b)).
However, the attractive part of Geurts’ analysis is that it allows for the possibility of picking up horses from the context to restrict the quantifier. This explains why children answer “No, not that one” as described above.

Hollebrandse & Smits (2004) suggest that even those children who seem to behave like adults don’t really do so. Under a weak reading, the child could quantify over the set of horses (and girls) and agree with the picture 1. This is based on the idea that weak quantifiers do not exhaust the set they quantify over (Hollebrandse 2002).

Hollebrandse & Smits (2004), without using a DRT framework, proposed that children take universal quantifiers to be weak. Translating this into Geurts’ model, this would mean that their interpretation involves a weak construal such as (13), which leads to unrestricted variable binding. No restrictor is picked up and the quantifier is free to bind any variable it can find. There are two possibilities: either the child applies a weak construal as in (10b), or a strong construal as in (11b). In the latter case the restrictor is not filled. After all, it is unclear whether the child is aware of the obligation to fill the empty slot in the construal proposed by Geurts (13).

4. Putting Things Together

We have seen that the weak-strong distinction has played a major role in the studies on the acquisition of quantification in recent years. The work of Drozd & van Loosbroek (1999) has focused on an analysis along the lines of presuppositionality. Geurts (2003) proposes an analysis in terms of a more elaborate mapping from form onto meaning in the case of strong quantifiers as compared to the mapping of weak quantifiers. We understand ‘more elaborate’ as involving more steps in the mapping.

We take a relational perspective on the weak-strong distinction and characterize it as a distinction between quantifiers that can be interpreted simply by taking into account the intersection of the relevant sets and those whose interpretation requires that one also take account of the complement set (as described in section 2). When acquiring quantification, children have to learn for each quantifier whether it is weak or strong, i.e. whether it is intersective or co-intersective. Keenan (2003: 195) puts it as follows:

“We expect the language learner to generalize from positive evidence - examples of DPs in there-sentences - so we expect to
find an identifiable property which is the basis of the generalization.”

So Dutch children have to learn to recognize the syntactic environment in which a weak or a strong quantifier is or is not able to occur. The Dutch quantifier *allemaal* now becomes highly interesting; it is interpreted as either weak or strong, depending on its syntactic position.

5. The Dutch Quantifier *Allemaal*

Strong quantifiers (*all, every, most*) are always strong, i.e. they are interpreted as co-intersective. Their interpretation always involves the comparison of the intersection of sets A and B with the complement set of A. To interpret (15) the flying parrots have to be compared with the ‘other’, i.e. non-flying, parrots.

(15) Most parrots are flying.

Weak quantifiers only involve the intersection of A and B. To interpret (16a) just the number of flying parrots has to be considered. However, (16b) is ambiguous between a strong reading and a weak reading. The sentence in (16c) lacks the weak reading completely.

(16) a. There are many parrots flying.
    b. Many parrots are flying.
    c. Many of the parrots are flying.

The Dutch quantifier *allemaal* is remarkable in this respect. It can occur in floated position, in which it has a strictly strong reading (like English *all*) (17a). However, it can also occur in prenominal position in which it is strictly weak (17b). The English translation of *allemaal* in (17b) is closer to *many* than to *all* (Hoeksema 1996, Hollebrandse 2002).

(17) a. *De papagaaien vliegen allemaal.*
    the parrots are flying all
    ‘The parrots are all flying.’
    b. *Er vliegen allemaal papagaaien.*
    there are flying allemaal parrots
    ‘There are many parrots flying.’
According to Milsark’s test, prenominal *allemaal* is weak: it is allowed in an existential sentence (17b). In (17a) the comparison of flying parrots and non-flying parrots is relevant, whereas in (17b) only the set of flying parrots is relevant.

So, the Dutch quantifier *allemaal* is weak or strong depending on its syntactic position (Hollebrandse 2002). In the experiment presented in the next section, we will use this distinction between weak and strong readings of *allemaal* in order to test whether children are able to construct both weak and strong interpretations in the proper context.

### 6. Experiment: Acquisition of the Weak-Strong Distinction

#### 6.1 Hypothesis

Our main hypothesis is that children only have a weak reading for the Dutch quantifier *allemaal*. In line with the hypotheses advanced by Drozd & van Loosbroek (1999) and Geurts (2003), we expect to find children who interpret a strong quantifier such as *all* as a weak quantifier. This means that children will prefer a reading of *allemaal* on which it is intersective regardless of its syntactic position (and its lexical characteristics). A child who applies a weak construal will only evaluate the intersection of the two sets constructed on the basis of the two arguments of the verb (cf. girls and horses in picture 1).

#### 6.2 Subjects

Thirty-nine subjects (range 4;1 to 6;7, 19 girls, 20 boys) from the after-school program of *De Boomhut* and primary school *De Vrije School* Groningen were tested. In addition, seven adults were tested as a control group.
6.3 Procedure

The children were tested using a Truth Value Judgment Task (Crain & Thornton 1998). We presented children with pictures analogous to picture 2. They had to judge prerecorded test sentences and say whether or not these sentences matched the pictures. Furthermore, every child was asked to explain each of her answers. We asked for explanations for both yes and no answers.

*Picture 2: De ezels huilen allemaal* (‘The donkeys are all crying’)

6.4 Design

There were three test conditions: ALLEMAAL-STRONG, ALLEMAAL-WEAK, and ALLE-STRONG. Sentences of the type (18a) with a floated *allemaal* were tested for the ALLEMAAL-STRONG condition (6 tokens). Sentences of the type (18b) with an existential *er* (‘there’) and *allemaal* in prenominal position were tested for the ALLEMAAL-WEAK condition (3 tokens), and sentences of the type (18c) were tested for the ALLE-STRONG condition (3 tokens).

(18) a. *De ezels huilen allemaal.*
   the donkeys are crying all
   ‘The donkeys are all crying.’
   b. *Er huilen allemaal ezels.*
   there are crying many donkeys
   ‘There are many donkeys crying.’
   c. *Alle ezels huilen.*
   all donkeys cry
   ‘All donkeys are crying.’
In addition to the test items, three control no-items and three control yes-items were included. The control no-items were plural sentences accompanied by pictures in which only one object was performing an action (e.g. one donkey was crying). The control yes-items were sentences containing alle (‘all’) accompanied by pictures in which all the objects were performing an action (e.g. all donkeys were crying). The total of test sentences was eighteen.

6.5 Predictions

In the ALLEMAAL-STRONG condition, the test sentence forces a strong construal for adults. Therefore, we expect that adults will reject picture 2 for (18a). In the ALLEMAAL-WEAK condition, which forces a weak construal for adults, they are expected to accept (18b). The ALLE-STRONG condition, e.g. (18c), will pattern with the ALLEMAAL-STRONG condition.

On the Weak-Construal Hypothesis, we predict that the children will accept test sentences from all three conditions: ALLEMAAL-STRONG, e.g. (18a), ALLEMAAL-WEAK, e.g. (18b), and ALLEMAAL-ALL condition, e.g. (18c).

6.6 Results

The adults correctly judged an existential sentence (e.g. (18b)) as truthfully describing a picture such as picture 2, by 86%. The tested children, however, only accepted the sentence 15% of the time. The main result is that the children disregard the syntactic environment of a weak quantifier and always interpret a weak quantifier as a strong one. These results are visualized in figure 1 in which both test conditions and control items are mapped on the x-axis versus the mean for yes-answers (in percentages) of adults and children on the y-axis. T-tests do not show a significant difference between the children’s answer regarding the ALLEMAAL-WEAK condition and the other test conditions. The children interpreted the control yes- and the control no-items like the adults. T-tests between children and adults show no significant difference.
The children’s and adults’ performance was analyzed with a 3 x 2 repeated-measures analysis of variance. The within-subjects factors were the sentence types ALLEMAAL-STRONG, ALLE-STRONG and ALLEMAAL-WEAK. The between-subjects factor was group (adult and child). The results show a main effect for sentence type ($F(2,88) = 110.02$, $p < .001$) and an interaction effect for sentence type * group ($F(2, 88) = 76.76$, $p < .001$). A main effect for group ($F(1,44) = 7.09$, $p = .011$) was also found between-subjects. A T-test (two-sided) showed a significant difference between the adults and the children regarding the condition in which allemaal is used as a weak quantifier (ALLEMAAL-WEAK) ($t(44) = -6.03$, $p < .001$).
There was no significant difference between adults and children for the other conditions.

Figure 2 was designed to examine individual results. Dots represent individual subjects’ interpretation. In the upper right corner are subjects who assign a weak interpretation, while the lower left corner represents subjects assigning a strong reading. The number of subjects in a dot is indicated by \( n = \# \). The right graph shows the results of the adults. The left graph gives the results for children.

Figure 2 plots the percentages of yes-answers with respect to the ALLEMAAL-WEAK condition against the percentages of yes-answers with respect to the ALLEMAAL-STRONG and ALLE-STRONG conditions together. Contrary to prediction, we find that most children (\( n=20 \)) analyze allemaal across all conditions as a strong quantifier. Only three children consequently interpret allemaal in line with the predictions as a weak quantifier. These three children (differing in age between 4;3 and 6;0) can be found in the upper right corner of the left graph in figure 2.

Six out of seven adults answered according to our predictions: they are represented in the upper part of the graph (a mean of 0% yes-answers on the test conditions ALLEMAAL-STRONG and ALLE-STRONG and a mean of 100% yes-answers on the condition ALLEMAAL-WEAK). Only one adult did not interpret allemaal as a weak quantifier in an existential sentence. This adult answered ‘no’ on all three conditions, apparently allowing only a strong reading for allemaal.
7. Discussion

The results show that children do not distinguish between the weak and the strong interpretation of *allemaal*: they analyze this quantifier as strong even when it is in a syntactic position in which it obligatorily gets a weak reading. This contrasts with the results for adults. Given the Weak Processing Hypothesis of Geurts (2003) and Drozd & van Loosbroek’s (1999) Weak Quantifier Hypothesis, we expected children to evaluate *allemaal* by only considering the intersection of the two relevant sets. However, the children clearly chose a strong reading, which involves comparing the intersection of the two sets with the remainder of one of the sets, as Geurts (2003) proposed.

Contrary to Geurts’ explanation that children opt for a less elaborate, i.e. weak, mapping for strong quantifiers, we find that they are able to construct a more elaborate mapping for strong quantifiers. It is quite possible that children use Geurts’ strong construal and obligatorily fill the restrictor, i.e. the dots in (12), repeated as (19). Rather than picking up the restrictor from the context (as Geurts expects), the child always, even in the obligatorily weak case, uses as a restrictor the set denoted by the noun phrase.

\[
(19) \quad [\ldots : \ldots] <\text{every}> [x, y : \text{girl}(x), \text{horse}(y), x \text{ rides } y]
\]

Further support for the child’s preference for strong readings comes from our additional experimental results for the quantifier *alle* (‘all’). On those trials the children always assigned a strong reading.

Transposing Geurts’ model to the case of *allemaal* and analyzing our experimental findings, (19) would translate into (20). In this DRS the restrictor is always filled by the set of donkeys. This results in an overwhelming number of answers like “No, not that one” on all three conditions.

\[
(20) \quad [x: \text{donkeys}] <\text{allemaal}> [x \text{ crying}]
\]

The main conclusion is that children have no trouble assigning strong readings to quantifiers, not even in cases where the quantifier is obligatorily interpreted as weak by adults.
Children in our experiment did not behave fully like adults. Another important conclusion is that children are not sensitive to the syntactic context in which allemaal occurs and do not allow strong and weak readings depending on that context. The syntactic clue of the existential construction, which forces a weak construal of allemaal in the target grammar, is not picked up by the children. This means that they do not build DRS (21), which is the one for a weak reading.

(21) \(<\text{allemaal}> [x: \text{parrots}(x), x \text{ flies}]\)

We do not find what Geurts (2003) expected, i.e. a weak construal for strong quantifiers, but we can represent our findings in Geurts’ model as follows. Our children overuse the construal in (19), resulting in only strong readings. This suggests that children apply a rigid mapping, always preferring a strong reading for allemaal, disregarding the syntactic context in which it occurs.

Moreover, our findings seem to contradict the explanation of Drozd & van Loosbroek (1999). The children in our experiment clearly do not interpret strong quantifiers as weak ones, as predicted by Drozd & van Loosbroek (1999). On the contrary, they interpret allemaal in a weak context as strong. Further experimental research should focus on the child’s interpretation of other quantifiers and their set-relational characteristics, since this paper only focuses on one particular quantifier. We do think, however, that these findings will carry over to other quantifiers as well.

In sum, the syntactic characteristics of the Dutch quantifier allemaal are highly complex, because it can have a strong or a weak reading. The syntactic environment plays a key role. In an early stage of learning how to interpret quantifiers, i.e. learning the mapping model between natural language, logic and the ‘real’ world, children only allow the elaborate mapping of information onto a strong construal. The reason why they disregard the syntactic clues, such as prenominal position, might be that they seek to avoid ambiguity. This results in an unambiguous rigid mapping, at the expense of taking into account the role of syntax.

Notes

1 First of all, we would like to thank children, teachers and parents of the after-school program De Boomhut and of the primary school De Vrije School, both in Groningen, for participating in the experiment. We would also like to thank Jack Hoeksema (Groningen University) and Angeliek van Hout (Groningen University) and the members of the Language Acquisition Lab.
at the University of Groningen and the audience, especially Jill de Villiers (Smith College) and Tom Roeper (UMass, Amherst) of the “From Syntax to SLI” workshop held at the University of Massachusetts, Amherst, as well as the audience at the conference “Indefinites and Weak Quantifiers” held in January 2005 at the Marie Haps Institute in Brussels. All errors remain ours. The work of Bart Hollebrandse was partly funded by the NWO project #360-70-010.

2 Drozd & van Loosbroek (in press) revise their Weak Quantification Hypothesis in terms of contextual information and presuppositions.

3 Test sentences were prerecorded to avoid any potential influence of intonation.

References


