

# German Determiner Presuppositions in First Language Acquisition\*

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## 1. Introduction

Three components of determiner meaning have been identified in semantics: truth conditions, implicatures, and presuppositions. Among the three components, the acquisition of truth-conditions (of the universal quantifier *every*) has received attention most intensively.

There has been more investigation on the acquisition of scalar implicature since Noveck (2001). Noveck (2001) observes that children are more likely to give semantic/logical responses to scalar implicature items than adults. Subsequent works on the acquisition of scalar implicature corroborated Noveck's (2001) result (Chierchia 2001, Gualmini *et al.* 2001, Papafragou & Musolino 2003, among others).

In this paper, I will focus on the third component of the determiner meaning: presuppositions. The acquisition of presuppositions have not received much attention so far. Karmiloff-Smith (1979), Schaeffer & Matthewson (2005) have observed that children's use of definite determiner is not adult-like, but not much else has been discussed so far about the acquisition of presuppositions. Our goal, therefore, is to investigate the missing part, which, we hope, would shed new light on our understanding of children's acquisition of determiner meaning.

## 2. Theory: Heim (1991)

Theoretical bases of this paper is a theory of presupposition proposed by Heim (1991). Heim (1991) proposes that there are two types of presuppositions: lexical and implicated. According to her theory, lexical presuppositions are part of lexical meaning of a lexical item. Implicated presuppositions, on the other hand, are derived in much the same way as implicatures. Consider the contrast in (1).

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- (1) a. #I interviewed a biological father of the victim.  
 b. I interviewed the biological father of the victim.

Adults find the sentence in (1a) strange. It sounds as if there are more than one father of the victim, and the speaker of the sentence interviewed only one of them. In the real world, however, there can be only one biological father of the victim. The awkwardness of (1a), compared to (1b), arises because of the presuppositions associated with the determiner *the*. The definite determiner *the* has at least two lexical presuppositions: the existence and uniqueness presuppositions. These presuppositions limit the use of the expression [*the*  $\zeta$ ] in the following way:

- (2) a. Existence presupposition: [*the*  $\zeta$ ] is felicitous only when there exists  $\zeta$  in the context.  
 b. Uniqueness presupposition: [*the*  $\zeta$ ] is felicitous only when there is a unique  $\zeta$  in the context.

Only when these two presuppositions are satisfied, a clause of the form [[*the*  $\zeta$ ]  $\zeta$ ] has a truth-value.

In contrast, the expression [*a*  $\zeta$ ] can be used when there is no unique  $\zeta$ . In fact, the oddness perceived from (1a) seems to indicate that the use of [*a*  $\zeta$ ] is felicitous when there is no unique  $\zeta$ . As Heim herself points out, though, assuming that [*a*  $\zeta$ ] is associated with non-uniqueness presupposition leads us to a problem, as the use of [*a*  $\zeta$ ] does not exclude the possibility that after more extensive investigation, it may turn out to be that there is only one  $\zeta$  in the context. Heim proposes that the indefinite determiner has no presuppositions associated with it. But then the question is, why do we feel that (1a) leads us to believe that there are more than one biological father of the victim?

Heim (1991) proposes that the non-uniqueness presupposition of the indefinite determiner is an implicated presupposition. According to Sauerland (to appear), the implicated presuppositions have the following characteristics that distinguish them from scalar implicatures on the one hand, and lexical presuppositions, on the other:

- (3) a. Weak epistemic status compared to scalar implicatures  
 b. Project through negation, which scalar implicatures do not  
 c. Project through universals, unlike lexical presuppositions

One of the examples from Heim (1991) in (4) exhibits the weak epistemic status of implicated presuppositions. The speaker of the example in (4) “leaves it quite open how many pathologically nosy neighbors I have and in no way discourages the hope that it’s only one” (Heim 1991).

- (4) A pathologically nosy neighbor of mine broke into the attic.

Following the insight of Hawkins (1981), Heim (1991) proposes that the contrast between (1a) and (1b) can be accounted for in much the same way as deriving the scalar implicatures. She proposes a new pragmatic maxim, called *Maximize*

*Presupposition.* Roughly speaking, *Maximize Presupposition* forces a speaker to use the expression that is associated with the strongest presuppositions possible that are compatible with the speaker's knowledge. A hearer who hears (1a), for example, would conclude that the presuppositions that are associated with (1b), either the existence presupposition or the uniqueness presupposition, or both, must not be compatible with the actual world, since if they were, the speaker would have used (1b), because (1b) is associated with stronger presuppositions than (1a).

Let us now consider the presuppositions associated with *every*. Consider the examples in (5). If I said the following sentences out of the blue, and you know that I do not have a horn, Kai has only one nose, and Lina has two cheeks, the sentences in (5) might sound strange.

- (5)
- a. #Every horn of mine is sharp.
  - b. #Every nose of Kai's is itchy.
  - c. #Every cheeks of Lina's is red.

The oddness of these sentences come from the presupposition failure.

*Every* has at least three presuppositions associated with it, shown in (6) (Sauerland 2003, to appear).

- (6)
- a. Existence Presupposition
  - b. Anti-uniqueness presupposition
  - c. Anti-duality presupposition

The existence presupposition limits the use of the expression [*every* X] to a context where there exists an X (therefore the oddness of (5a)). The anti-uniqueness presupposition, on the other hand, limits the use of the same expression to a context where the set formed by all Xs in the context is not a singleton set. This is why the sentence in (5b) sounds strange: the set formed by *nose of Kai's* is a singleton set. The anti-duality presupposition limits the use of the same expression to a context where the set formed by all the Xs is not a two-membered set. This is why the sentence in (5c), in which the set formed for *cheeks for Lina's* is a two-membered set, is perceived strange.

Among the three presuppositions, only the existence presupposition is lexical. As Sauerland (to appear) points out, *every* has weak epistemic status, as can be seen in (7)(from Sauerland (to appear)). The example in (7) does not presuppose that there will be more than two students in my next class. Merely a possibility that there could be more than two students in my next class make the sentence felicitous.

- (7) Every student in my next class will to work hard.

I will assume, therefore, that the only lexical presupposition of *every* is the existence presupposition. The other two presuppositions, on the other hand, are implicated presuppositions.

Heim's (1991) theory makes the following predictions. We expect that the lexical presuppositions to be acquired earlier than the implicated presuppositions.

This is expected for two reasons: (i) Lexical presuppositions are part of the lexical meaning of an item; and (ii) Children may have difficulties with the implicated presuppositions in the same way as they have difficulties with the scalar implicatures, (Noveck 2001, Gualmini *et al.* 2001, Papafragou & Musolino 2003, among others) if the cause of difficulties stem from the pragmatic mechanism.

The goal of the experiment presented in the next section is to test whether the predictions are borne out<sup>1</sup>.

### 3. Experiment: Presupposition Judgment Task

In this experiment, we tested children's understanding of presuppositions associated with *jeder* 'every' and *beide* 'both'. Recall that the universal quantifier has three presuppositions associated with it: existence, anti-uniqueness, and anti-duality presuppositions. We compared the acquisition of the existence presupposition and that of the anti-uniqueness presupposition, leaving the anti-duality presupposition aside for this experiment. We also tested *beide*, which has lexical duality presupposition. It was tested to compare the acquisition of lexical presupposition, associated with another determiner.

#### 3.1. Presupposition Judgment Task

In Presupposition Judgment Task, a subject is shown a series of pictures. In each picture, there is a character with a speech bubble emerging from his/her mouth, indicating that he/she is saying something. On a sheet of adhesive paper, potential utterances of the character are printed. An experimenter explains to the subject that some of the sentences could probably go inside of the speech bubble because the character would say something like that in the context, but some other sentences would not fit inside because the character would not say something like that. The subject's task is to determine whether the sticker should be placed inside of the speech bubble or not. When they decided that the character in the picture would say the sentence, the subject placed the sticker inside of the speech bubble. Each sentence would be read to the subject by an experimenter. The assumption is that subjects would place the stickers with sentences that they feel to be felicitous in the given context (scene depicted in the picture), inside of the speech bubble.

#### 3.2. Participants

We have tested 30 children each from four different age groups: 6- (6;1-6;11, mean age=6;7), 7- (7;0-7;11, mean age=7;5), 8- (8;1-8;11, mean age=8;6), and 9-year-olds (9;0-9;10, mean age=9;5). Children that participated in this study were recruited from three public schools in Berlin, Germany. 12 adults participated as a control.

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<sup>1</sup>In Yatsushiro (to appear), I use felicity judgment task to show that the second prediction is also borne out.

### 3.3. Materials and Procedure

In the present experiment, subjects were shown eight pictures, depicting eight different scenarios about a character, called *Jonathan*. There were 44 sentences all together, printed on an adhesive paper. Five sentences each tested the existence and anti-uniqueness presuppositions of *jeder* 'every', and three sentences tested the duality presupposition of *beide* 'both'. The rest of the items were fillers. The sentences were read out loud by the experimenter.

Let us consider the actual picture and sentences used in the experiment.

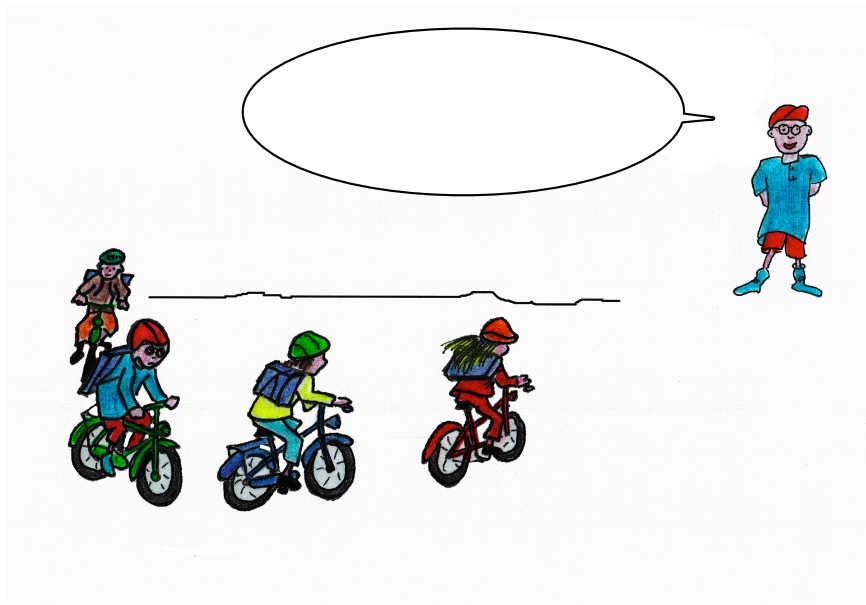
The main character, Jonathan, was always shown at the top right corner of the picture, with a speech bubble emerging from his mouth. Nobody else on the picture has a speech bubble. When introducing the task to the subject, the experimenter asked him/her whether he/she knew what the speech bubble was supposed to indicate, and when the subject did not say what the speech bubble did in, for example, a comic book, she explained that speech bubbles indicated that the character with a speech bubble was saying something in the picture.

Each picture depicted different scenes. The first picture, shown in (8), was used to familiarize the subject with task they are supposed to perform. There were six sentences that included clearly false and clearly true statements. A clearly false sentence included (9a), which is clearly false because Jonathan is carrying a blue school backpack<sup>2</sup>. All the sentences were read out loud by the experimenter. When the subject accepted the sentence, we discussed the picture with the subject, asking the subject to point to *Jonathan* first, and then asked which color his school backpack was. The experimenter then repeated the sentence in (9a) and asked whether this should really be placed inside of the speech bubble. The sentence in (9b) was offered to the subject next, which is a clearly true sentence.

(8)

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<sup>2</sup>In this picture, Jonathan appears twice (once as a speaker, and once as part of the context), and we pointed this out to the subjects at the beginning, so that they can identify the context correctly



- (9) a. Auf diesem Bild trage ich einen roten Schulranzen.  
 on this picture carry I a red school-backpack  
 'On this picture I am carrying a red school backpack.'
- b. Auf diesem Bild trage ich einen blauen Schulranzen  
 on this picture carry I a blue school-backpack  
 'On this picture I am carrying a blue school backpack.'

The other seven pictures contained experimental items. Recall that there were two determiners that we tested in this experiment: *jeder* 'every' and *beide* 'both'. We tested two of the presuppositions associated with *jeder*, the existence and anti-uniqueness presuppositions. The existence presupposition is lexical, and the anti-uniqueness presupposition is a derived one. We tested whether the subjects would find the use of the expression [*jeder*  $\zeta$ ] in a context where (i) there is no  $\zeta$ , and (ii) there is only one  $\zeta$  felicitous. *Beide*, on the other hand, has only a lexical presupposition: duality presupposition. We tested whether subjects would find the use of the expression [*beide*  $\zeta$ ] in a singleton domain and three-membered set domain felicitous.

The existence and anti-uniqueness presuppositions were tested, using a picture like in (10). (10) is a picture of Jonathan's family. After introducing the protagonists as his mother, father, two brothers, and a sister, six sentences were presented to the subjects, including an item to test the existence presupposition and one testing anti-uniqueness presupposition, which are shown in (11). (11a) tests the understanding of the existence presupposition, because there is no uncle present in the picture, and (11b) tests the understanding of the anti-uniqueness presupposition, because there is only one mother in the picture.

(10)



- (11) a. Jeder Onkel von mir sitzt auch auf einem Stuhl.  
every uncle of mine sits also on a chair  
'Every uncle of mine is also sitting on a chair.'
- b. Jeder Mutter von mir sitzt hier auf einem Stuhl.  
every mother of mine sits here on a chair  
'Every mother of mine is sitting on a chair here.'

Duality Presupposition was tested, using a picture like in (12). We introduced the picture in (12) as pictures of Jonathan and his toys. After telling the subject that these are *all* the toys that Jonathan has (no other balls, no other rocket, for example), we presented the sentences for this picture, which included test items. With this specific picture, duality presupposition of *beide* was tested twice: once where the argument is a three-membered set, and once where the argument is a singleton-set.

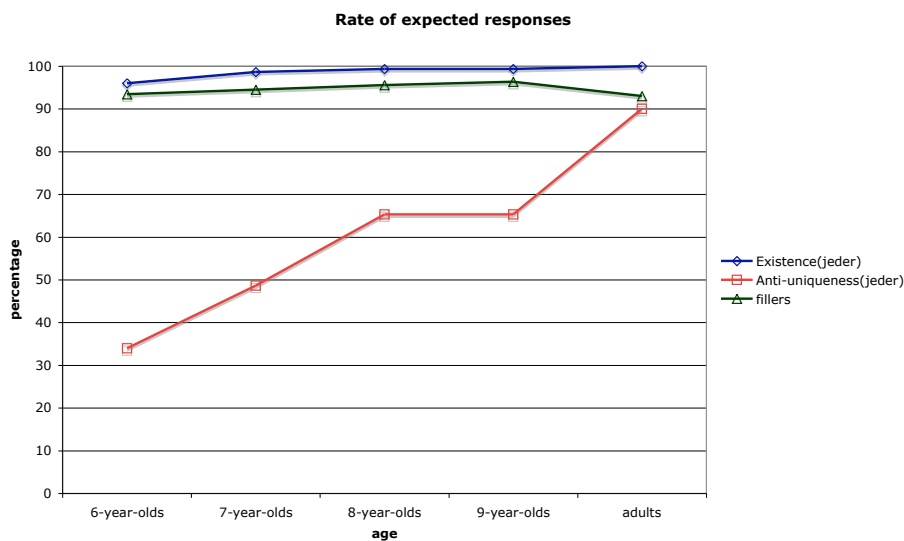


- (12) a. Beide Kuschteltiere sind auf dem Regal.  
 both stuffed-animals are on the shelf  
 'Both stuffed animals are on the shelf.'
- b. Beide Raketen von mir sind blau.  
 both rockets of mine are blue  
 'Both rockets of mine are blue.'

### 3.4. Result

Let us first discuss the acquisition of the existence and anti-uniqueness presuppositions. As can be seen in the graph in (13), children seem to have acquired the existence presupposition of *jeder* by age 6. The rate of expected responses here is the way adults are expected to respond, which is to reject the placement of the sentence in the speech bubble. The rate of expected responses across all age groups that were tested in this experiment was above 90%.

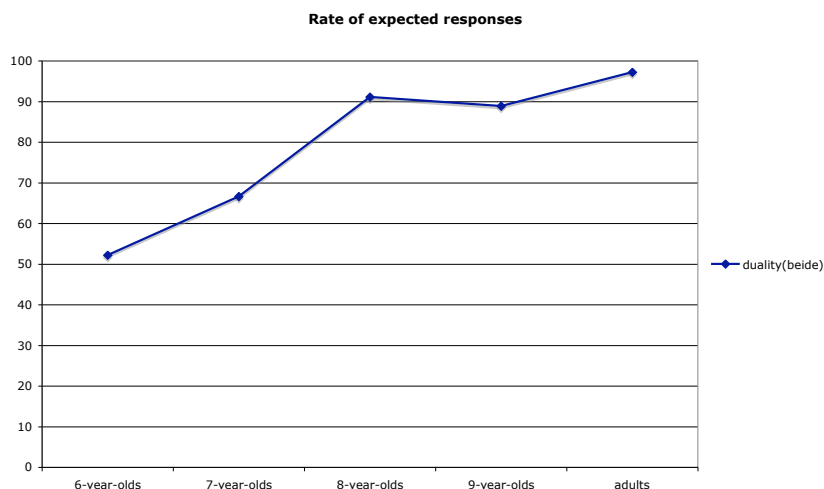
The anti-uniqueness presupposition, on the other hand, shows different curve on the graph. The adult controls rejected these sentences 90% of the time. Children rejected much less frequently, however. 6-year-olds rejected 34% of the time, 7-year-olds did so 48.7, 8-year-olds and 9-year-olds both rejected 65.3% of the time.



According to the result shown in (12), one of the predictions discussed above is borne out: the lexical presupposition (the existence presupposition) is acquired earlier than the implicated presupposition (the anti-uniqueness presupposition).

Next consider the result from the duality presupposition items. The rate of expected responses for the duality presupposition items is around 52% for the 6-year-olds, 66.7% for the 7-year-olds, and around 90% for the 8- and 9-year-olds. The adults rejected the use of *beide* in a singleton and three-membered-set contexts 97.2% of the time.





Recall that the duality presupposition of *beide* 'both' is a lexical presupposition. The result from the duality presupposition items is interesting in that we see difference between the acquisition of lexical presuppositions associated with two different determiners.<sup>3</sup>

#### 4. Summary

The goal of this paper was to find out whether the predictions that follow from Heim's 1991 theory of two types of presuppositions, shown in (13), are borne out, using the Presupposition Judgment Task.

- (13) a. Lexical presuppositions are acquired earlier than implicated presuppositions.  
 b. Children have the same difficulties with the implicated presuppositions as they do with the scalar implicatures.

One of the results emerged from the experiment is that between the two presuppositions associated with *jeder* 'every', the lexical presupposition (the existence presupposition) is acquired earlier than the implicated presupposition (the anti-uniqueness presupposition). The result supports the predictions that the lexical presuppositions are acquired earlier than the implicated presuppositions.

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<sup>3</sup>It is not clear at this point why the duality presupposition of *beide* 'both' takes longer to acquire than the existence presupposition of *jeder* 'every'. I leave this issue for future research.

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