

The acquisition of the German Focus particle *auch* 'too': Comprehension does not always precede production

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1. Introduction

Lexical items like the so-called focus particle *also* 'too' are optional elements which operate on a sentence modifying its meaning in a characteristic way. For the following we will basically rely on the analysis of focus constructions by authors like Dimroth (1998), Dimroth & Klein (1996), Jacobs (1983), König (1991), Krifka (1999), and Rooth (1985). Thus given the German sentence

(1) Max fährt Boot.

Max drives a boat.

this sentence is true if it holds that there is a person *a* (Max) and an object *b* (boat) and *a goes by b*

If we add the particle *auch* to the sentence in (1) as in (2)

(2) Max fährt auch Boot.

Max drives also a boat

the meaning of (2) results from the meaning of (1), plus the lexical meaning of the particle *auch* which we will specify below, and from the scope of the particle, i.e. the part of (1) on which the particle may operate. On which part it operates depends essentially on the position of the particle in the sentence. In its position in (2), i.e. after the finite verb of a declarative sentence, the whole sentence may constitute the scope of the particle. The part of the scope of the particle on which the particle operates constitutes the focus of the sentence. It has to be indicated by additional means like intonation. Thus (2), under the default intonation with the main stress on the complement of the verb, *Boot* 'boat', i.e. (2'),

(2') Max fährt auch **BOOT**¹

Max drives also a **BOAT**

has the meaning in (3):

¹ Capitals indicate stressed elements

- (3) Max drives a boat
& he drives also at least one other thing than a boat from the set of drivable things

That is, the focus particle *auch* puts the focus of (3), i.e. 'boat', into a specific relation to the elements of a set of alternatives, i.e. drivable things. This constitutes the lexical meaning of *auch*. In the present case this relation can be characterized as an additive one.²

What exactly constitutes the set of alternatives in a given speech situation has to be inferred by the hearer from the linguistic and non-linguistic context or from general world knowledge.

In case the focus particle receives stress like in (4)

- (4) Max fährt **AUCH** Boot
Max drives a boat, TOO

it is the subject and what is predicated over it, i.e. the verb phrase *fährt Boot* 'drives a boat', which constitute the focus of (4), the meaning of which can be represented as in (5):

- (5) Max drives a boat
& there is at least one other person who drives a boat

That is, the set alternatives is constituted by all the other people in the relevant context for who it is true that they drive a boat.

To summarize, we have analyzed two uses, a stressed one, and an unstressed one of the German focus particle *auch* 'too' in declarative main clauses in postverbal position. In both cases the particle had an additive interpretation. In the case of unstressed *auch* in (2'), the stress on the following element, i.e. the object of the verb, indicates the focus of the sentence which is related through the meaning of the focus particle to a set of alternatives. In the case of stressed *auch* as in (4), the subject of the sentence and what is predicated over it, i.e. the verb phrase, is identified as the focus, and thus defines the set of alternatives.

2. The acquisition of focus particles

2.1 Production

The analysis of longitudinal spontaneous speech data shows that the focus particle *auch* is among the first lexical items acquired by German learning children (e.g. Niderstigt 2001; Penner, Tracy & Weissenborn 2000; Weissenborn 2000). Its use is basically adultlike as well prosodically, as

² There are other meaning variants of *auch* which we cannot discuss here (e.g. Dimroth & Klein 1996).

syntactically, and semantically. Thus Nederstigt (2001) provides evidence that the child analyzed by her between 10 and 40 months of age obeys the relation we have seen exists between the particle *auch* and the focus of the sentence, as marked by intonation. That is, in the case of wide focus like in (4), the focus particle receives stress, whereas in the case of narrow focus the complement of *auch* is stressed. More specifically, she shows that like adults, children under the age of three prefer the use of stressed *auch* 'too' with wide focus (60% of the cases) over the use of unstressed *auch* 'too' with narrow focus on the immediately following stressed complement (10% of the cases).

2.2 Comprehension

Contrary to the early adultlike use of focus particles in production there is evidence that the comprehension of sentences with focus particles is a relatively late development. More specifically, a number of experimental studies found that children of three years of age and older had difficulties to make use of prosodic focus information in the interpretation of sentences (e.g. work by C. Chomsky, 1969; Solan, 1980; McDaniel & Maxfield, 1992; Halber, Crain, Shankweiler & Woodams, 1995; Penner & Roeper, 2000; Vogel & Raimy, 2002; Gualmini, Maciukait & Crain, 2002). The behavior of the children is not uniform. It is sometimes adultlike, sometimes not. This may in some cases be related to differences in the contextual integration of the test items as suggested by Bergsma (2002), and Drozd & van Loosbroek (1998).

These findings seem to be at variance with a large body of research which shows the high sensitivity of children, present basically at birth, to the prosodic properties of the input which they put to use in the identification of linguistic units like words, phrases and sentences, and the detection of the regularities which underly the combination of these elements (for an overview, see e.g. Jusczyk, 1997; Vihman et al., 1998; and contributions in Weissenborn & Hoehle, 2001). In the light of these findings, and the findings from production studies, the difficulties much older children have with the interpretation of focus intonation asks for an explanation.

Our general starting hypothesis is that the difficulties of the children reflect their problems to relate the lexical, syntactic, discursive, and situational aspects of the meaning of an utterance on the one hand to the prosodic focus information on the other hand.

3. The present study

The aim of the present study is to contribute to our understanding of the dissociation between the productive and the receptive capacities in the development of the interpretation of prosodic focus information in combination with focus particles like *auch*.

More specifically, based on the finding of Nederstigt (2001) reported earlier, that children as young as one year and a half obey the relation between the

particle *auch* and the focus of the sentence, as marked by intonation in their productions of focus constructions, and given the early sensitivity of children to prosodic information, we wanted to test the hypothesis, that the development of the adultlike interpretation of sentences like (2') and (4) should be a function of the complexity of the task to determine and to integrate the different elements of information from which results the meaning of these sentences.

Thus we hypothesized that it should be easier for the children to correctly interpret a sentence like (4) because the default scope of the particle *auch* is the whole sentence, and that the focus of the sentence, as indicated by the focus intonation on *auch* is equally the whole sentence, as we have already seen above. Thus the scope of the particle *auch* and the focus of the sentence by which the set of alternatives,- here the set of individuals other than the subject who drive a boat-, is defined are coextensive.

Whereas we hypothesized that the children should have more difficulties with sentences like (2'). In (2') as in (4) the potential scope of the particle *auch* is the whole sentence. But contrary to (4), the focus of (2'), the complement of the verb, as indicated by the focus intonation on the object, and with it the set of alternatives is not coextensive with the scope of the particle *auch*. It is this discrepancy between the extension of the scope of the particle and the focus of the sentence which may make it harder for the children to derive the meaning of a sentence like (2') than a sentence like (4).

3.1 Method

32 children ranging in age from 2;11-7;8 years, and 20 adults participated in the experiment, a picture-sentence-matching task.³ They were divided into four age groups (see Table 1).

Table 1 Subjects

	Age	Mean Age	n
Group 1	2;11 – 3;8	3;3	9
Group 2	4;1 – 5;0	4;5	9
Group 3	5;1 – 7;8	5;8	11
Group 4	23;0 – 49;0	36;2	20

All participants were monolingual German speakers and had no known deficits of cognitive or language development.

³ 3 children were excluded because they failed the control condition.

We constructed three sets of 10 sentences each, that is two sets of test sentences and one set of control sentences, that are listed in the Appendix. An example sentence for each set is given in (6).

- (6)
- a. **stressed *auch* 'too' with wide focus**
 Max will AUCH Boot fahren.
 Max TOO wants to drive a boat.
 - b. **unstressed *auch* 'too' with narrow focus**
 Max will auch BOOT fahren.
 Max too wants to drive a BOAT.
 - c. **control sentence**
 Max fährt Boot.
 Max drives a boat.

Thus one set was composed of sentences containing the stressed particle *auch* 'too' resulting in wide focus (6a). A second set was composed of the same sentences containing the unstressed particle *auch* 'too' followed by the stressed complement of the verb resulting in narrow focus (6b). A third set was composed of again the same sentences but without the modal verb *wollen* 'want' and the focus particle (6c). The sentences containing the particle *auch* were constructed with the modal verb *wollen* 'want' in order to facilitate the visual presentation and recognition of the sentence meaning.

The main stress of the test sentences was analysed by PRAAT 3.9. in order to guarantee that the stress in both types of test sentences (6a; 6b) was acoustically comparable. Examples of the pitchanalysis of the sentences with the stressed particle *auch* 'too' (Table 2.1) and the stressed complement (Table 2.2) are given below.

Table 2.1 Example of pitch analysis for stressed *auch* 'too'

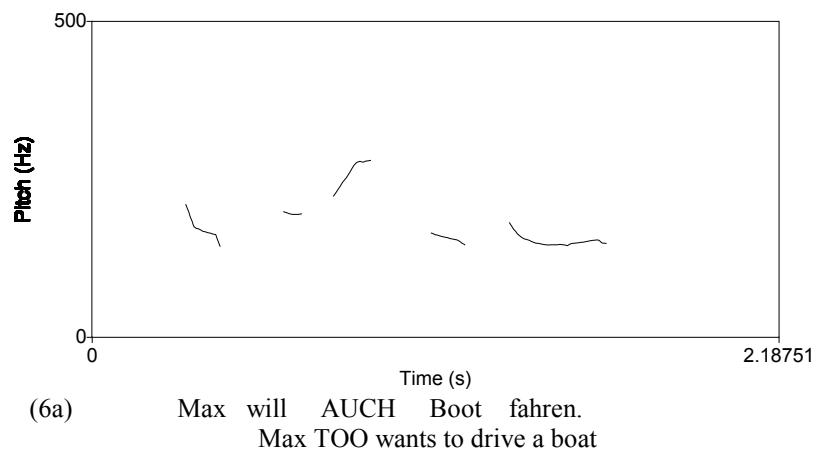
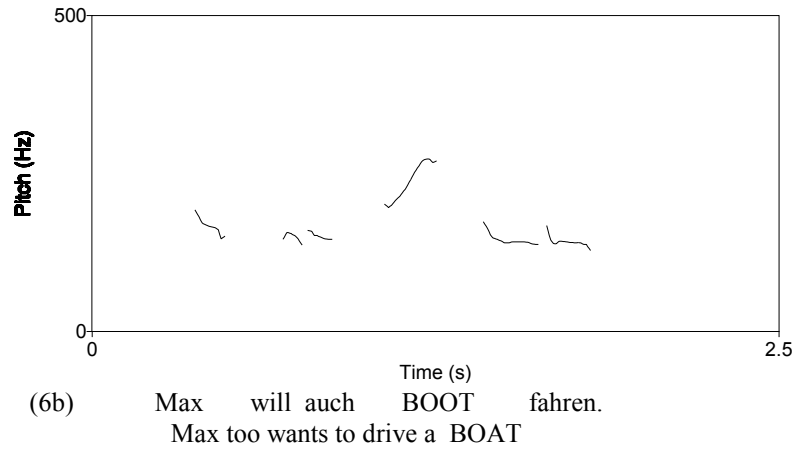
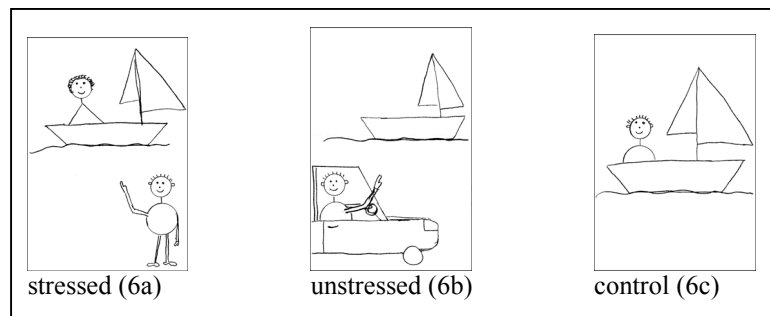


Table 2.2 Example of pitch analysis for stressed complement



For each sentence we draw a picture representing the meaning of the sentence. An example is given in Table 3.

Table 3 Example of pictures used in the experiment



The three pictures were presented simultaneously. The subjects had to point to one of them after twice listening to one of the sentences like in (6) presented by a CD-Compact-Player. Children and adults were familiarized with the procedure with a test set of six sentences (two of each condition) in order to guarantee that all subjects understand the test instruction.

The children were tested at their kindergardens and the adults at their homes. Each subject was tested separately.

4. Results

As shown in Table 4 children performed overall significantly worse than adults. For all groups sentences with unstressed *auch* 'too' and narrow focus on the complement of the verb were less often correctly interpreted than sentences with stressed *auch* 'too' and wide focus.

Table 4 Mean percentage of correctly matched sentences

Mean percentages (with standard deviations)

	stressed <i>auch</i> 'too'	unstressed <i>auch</i> 'too'	control
Group 1 2;11 – 3;8	55.56 (17.40)	22.22 (17.16)	98.88 (3.33)
Group 2 4;1 – 5;0	65.56 (21.86)	37.78 (31.14)	96.66 (5.00)
Group 3 5;1 – 7;8	62.73 (16.18)	48.18 (21.36)	99.09 (3.01)
Group 4 23;0 – 49;0	92.00 (11.52)	88.00 (24.41)	99.00 (3.07)

A 4 (Group) x 3 (Sentence Type) ANOVA confirms this observation. There were two significant main effects, one for *Group* ($F(3,45) = 31,86; p < .0001$) and one for *Sentence Type* ($F(2,45) = 100,48; p < .0001$). In addition there was a significant interaction of *Group* and *Sentence Type* ($F(6,90) = 10,58; p < .0001$), which was examined by between-subject ANOVAs. There was a significant effect for stressed vs. unstressed *auch* 'too' in Group 1 ($F(1,8) = 20,00; p < .0021$) but not in Group 2 ($F(1,8) = 3,40; p > .05$), Group 3 ($F(1,10) = 2,75; p > .05$) and Group 4 ($F(1,19) = 0,64; p > .05$).

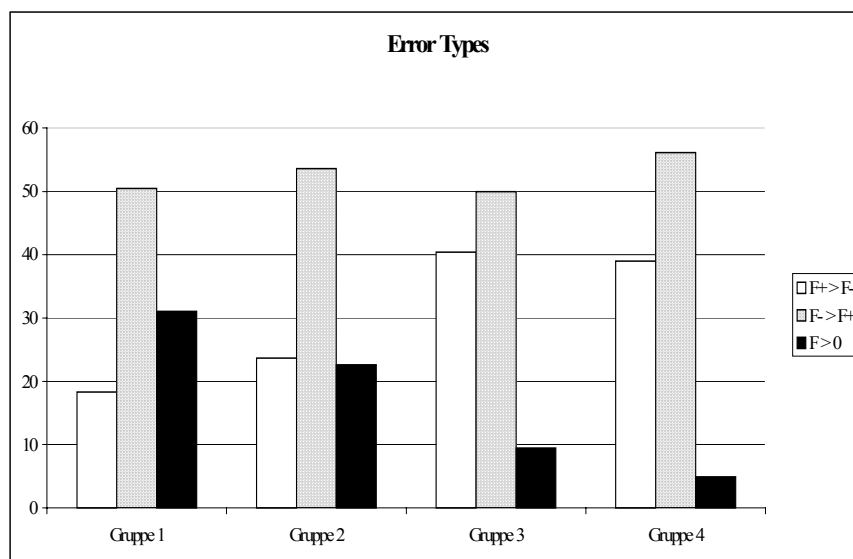
For the test sentences three different kinds of errors were possible. They are shown in Table 5.

Table 5 Types of Errors

F+ > F-	interpreting a sentence with stressed <i>auch</i> 'too' (F+) as a sentence with unstressed <i>auch</i> 'too' (F-)
F- > F+	interpreting a sentence with unstressed <i>auch</i> 'too' (F-) as a sentence with stressed <i>auch</i> 'too' (F+)
F > 0	interpreting a sentence with a focus particle as a sentence without a focus particle

The occurrence of the different types of errors for each group is shown in Table 6.

Table 6 Percentage of error types



For all groups interpreting a sentence with unstressed *auch* 'too' (F-) as a sentence with stressed *auch* 'too' (F+) is the most frequent error type. It represents about 50% of the errors for each age group. In contrast to the constant percentage of this type of error across all age groups the other two error types show a development. Thus the error type F+ -> F- where sentences with stressed *auch* 'too' (F+) are interpreted as sentences with unstressed *auch* 'too' (F-) increases from 18,1% to 39,0% from the youngest age group to the oldest age group of the children and to the adults. Finally, the interpretation of a sentence with a focus particle as a sentence without a focus particle (F -> 0) decreases from 31,1% to 4,5% with increasing age.

5. Discussion

Our results confirm the earlier findings by other researchers that the adultlike interpretation of sentences with focus particles is a relatively late achievement. Our results also indicate that contrary to the adultlike knowledge of the relation between the particle *auch* and the focus of the sentence, as marked by intonation, which German children display in production from very early on (Nederstigt, 2001), even our oldest group of children (mean age 5;8) was far from showing adultlike knowledge in comprehension. Our findings thus confirm the assumption that in the case of *auch* 'too' productive knowledge significantly precedes interpretive knowledge.

Our results further support our initial hypothesis that it should be easier for children to correctly interpret sentences with stressed *auch* in which the scope of the particle and the focus of the sentence are coextensive (e.g. 6a) as compared to sentences with unstressed *auch* and the stressed adjacent complement of the verb (e.g. 6b) in which the scope of the particle and the focus of the sentence are not coextensive. As shown in Table 4, sentences with unstressed *auch* 'too' were interpreted less often correctly than sentences with stressed *auch* 'too'. This holds especially for the two youngest groups of children (Group 1 and Group 2). For these two groups the percentage of correctly interpreted sentences with unstressed *auch* 'too' is close to the level of guessing while more than half of the sentences with stressed *auch* 'too' were interpreted correctly. We suggested that one reason for the lower performance on sentences with unstressed *auch* was possibly the fact that the discrepancy between the extension of the scope of the particle and of the focus of the sentence in these sentences makes it harder for the children to derive the meaning of a sentence like (6b) than of a sentence like (6a).

This explanation receives additional support first from the fact that about 50% of all errors across all age groups was to interpret a sentence with an unstressed particle and stress on the verbal complement as sentence with a stressed particle. This finding suggests that the wide focus interpretation may be considered to be the default interpretation for this type of focus constructions, just because of their lower interpretative complexity.

And second, the fact that in production children as well as adults use the construction with stress on the particle much more frequently than the construction with the stress on the following element (Nederstigt, 2001) may also be considered to further support the view that the constructions with stress on the particle are generally easier to process.

That the presence of a focus particle increases in general the difficulty to interpret a sentence is suggested by the errors which consist in ignoring the particle. As shown in Table 6 these errors decrease gradually with increasing age. We assume, following Paterson et al (2003), that these errors reflect the difficulty children initially have to infer the set of alternatives to the focus of the sentence as asked for by the meaning of the particle.

To conclude we briefly want to comment on the third type of errors which increases with age, namely the interpretation of sentence with a stressed particle as a sentence with an unstressed particle and stress on the following verbal complement. This finding supports the assumption of Paterson et al. (2003) made with respect to the interpretation of the focus particle *only* that for some participants it may be easier to construct a set of alternatives for objects as in the case of narrow focus on the verbal complement than for events as in the case of wide focus on the subject of the sentence and what is predicated over it.

Further research has to clarify the role of other factors like ‘position’ in the interpretation of the focus particle *auch*, and to which extent the results for *auch* can be generalized to other focus particles.

Appendix

Test sentences

Set 1

Max isst Kuchen.
Max will AUCH Roller fahren.
Max trinkt Milch.
Max will auch HÄUSER malen.
Max will auch ENTEN füttern.
Max schneidet Brot.
Max will AUCH Zeitung lesen.
Max will AUCH Stiefel putzen.
Max backt Plätzchen.
Max will AUCH Gurken schälen.

Set 2

Max will AUCH Kuchen essen.
Max will AUCH Milch trinken.
Max fährt Roller.
Max will AUCH Häuser malen.
Max will AUCH Plätzchen backen.
Max füttert Enten.
Max will auch BROT schneiden.
Max will auch ZEITUNG lesen.
Max will auch STIEFEL putzen.
Max schält Gurken.

Set 3

Max will auch KUCHEN essen.
Max liest Zeitung.
Max will auch ROLLER fahren.
Max will auch MILCH trinken.
Max malt Häuser.
Max will AUCH Enten füttern.
Max will AUCH Brot schneiden.
Max putzt Stiefel.
Max will auch GURKEN schälen.
Max will auch PLÄTZCHEN backen.

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