

What the use of the German focus particle *auch* can tell us about the influence of structural properties of the context

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In four experiments using a sentence fragment arrangement task, we investigated to what extent speakers are influenced by structural properties of the context, and to what extent they rely on default mechanisms (e.g., subjects are prototypical topics, objects are likely to be the focus of an utterance) when they integrate unstressed or stressed German additive *auch*. Results show that speakers strongly rely on default mechanisms, but that they are also primed by the structure of the context. Word order has a greater impact than prosodic properties of the context, and the underlying structure does not seem to have an influence.

1 Introduction

Additive particles such as English *also*, French *aussi*, Italian *anche* and German *auch* associate with a constituent (the associated constituent, AC, see *Maria* in 1a and 1b), and this AC is related to contextually relevant discourse alternatives (see *Peter* in 1). However, compared to English, French or Italian, German distinguishes between two variants of the additive particle *auch*, namely an unstressed (see 1a) and a stressed variant (see 1b).

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| (1) Peter hat Pflirsiche gegessen. | ‘Peter has eaten peaches.’ |
| a. Auch [Maria] hat Pflirsiche gegessen. | ‘Maria has eaten peaches, too.’ |
| b. [Maria] hat AUCH Pflirsiche gegessen. | ‘Maria has eaten peaches, too.’ |

There are several differences between these two variants. From an information structural perspective, the AC of stressed *AUCH* has the status of a contrastive topic (AC_T , see Krifka 1999), and the AC of unstressed *auch* is the focus of the utterance (AC_F). Intonationally, AC_T and stressed *AUCH* are said to build a bridge contour which combines two pitch accents: a rising accent on the contrastive topic (Braun 2012), and a falling accent on the corresponding focus part, i.e. the particle (e.g., Büring 1997). In the case of unstressed *auch*, the particle is unstressed and the AC_F carries a pitch accent. With respect to the syntactic surface structure, stressed *AUCH* follows its AC, while unstressed *auch* precedes its AC. Finally, stressed *AUCH* is often related to an AC being the subject, and unstressed *auch* to an AC being the object of the utterance (e.g., Höhle et al. 2009). However, several of these factors are intermingled, and speakers seem to rely on default mechanisms when choosing between the two variants of *auch*: If the AC of *auch* is the subject, it most likely has the information structural status of a topic (AC_T) (Reinhardt 1981), which preferably is the AC of stressed *AUCH*.

The data of a sentence fragment arrangement task (Reimer & Dimroth, in press) show that speakers indeed have a strong preference for stressed *AUCH* when the AC is the subject and for unstressed *auch* when the AC is the object, indicating that speakers strongly rely on these default mechanisms. However, the results further show that a speaker’s choice can be affected by (information) structural properties of a context sentence: While the preference for unstressed *auch* for objects was 93%, the preference for stressed *AUCH* for subjects was only 69%. This reduced preference for stressed *AUCH* in the subject condition can be attributed to the specific context that was used in the experiment: The context sentence contained the focus particle *nur* (see 2).

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| (2) Peter und Maria haben Appetit auf Obst. Ich wette, nur [Peter] hat Pflirsiche gegessen. | ‘Peter and Maria want to eat fruits. I bet only Peter has eaten peaches.’ |
| a) Nein! [Maria] hat AUCH Pflirsiche gegessen. | ‘No! Maria has eaten peaches, too.’ |
| b) Nein! Auch [Maria] hat Pflirsiche gegessen. | ‘No! Maria has eaten peaches, too.’ |

A continuation of the dialogue with 2a, where *auch* follows its AC, was expected to be the default option. However, participants often chose the continuation 2b. Thus, the presence of *nur* in the context sentence – a particle that precedes its AC, which in turn is a focus – may lead participants to integrate the particle *auch* in a way that results in a similar structure. Thus, speakers may have been primed by the (information) structure of the context sentence when they constructed their utterance (see Bock 1986, Branigan 2007, Ziegler et al. 2019, Ziegler and Snedeker 2019 for structural priming; see Fleischer et al. 2012 for information structural priming).

In order to examine this instance of priming more closely, we conducted four experiments using a sentence fragment arrangement task. Specifically, we asked whether the strong preference for unstressed *auch* in the object condition found in Reimer & Dimroth (in press) can be mitigated by structural properties of the context as well.

2 Experiment 1

2.1 Methods

As in the study by Reimer & Dimroth (in press), we used context sentences containing the particle *nur* (***nur*** *Birnen*, ‘only pears’). However, since *nur* always precedes its AC, we further included two conditions with negations in different positions: *keine* (***keine*** *Birnen*, ‘no pears’) which precedes the AC, hence similar to *nur*, and *nicht* (*Birnen* ***nicht***, ‘pears not’), which follows the AC. If the surface structure of the context sentence [**X** + AC/ AC + **X**] influences the choice of the speaker to use stressed or unstressed *auch* in the target sentence, we expect speakers to use more stressed **AUCH** when the context comprises the negation *nicht* than if it comprises the focus particle *nur* or the negation *kein*. If, however, participants solely rely on default mechanisms (objects are likely to be the focus of the utterance; unstressed *auch* associates with a focused constituent), we expect speakers to use unstressed *auch*, independent of the elements in the context. Twenty-one native speakers of German took part in the web-based experiment (SoSci-Survey, Leiner 2014; all participants were recruited with the software hroot, Bock et al. 2014). After silently reading the context sentences, participants had to arrange a target sentence by dragging and dropping given words (presented in boxes in randomized order, see Figure 1).

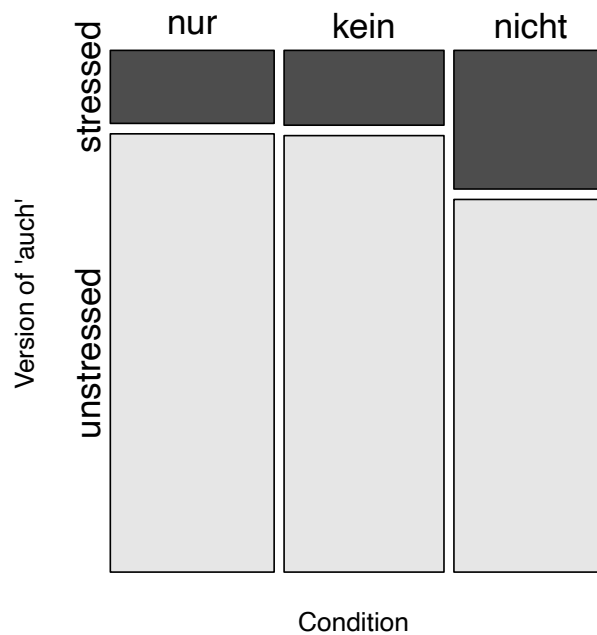
Figure 1



2.2 Results

We analysed the position of the particle *auch* relative to its object AC in the resulting target sentence. We performed a generalized linear model on the unstressed realizations in R (R core Team 2017, package lme4, Bates et al. 2015). The fixed-effects factor was the element in the context (*nur*/ *kein*/ *nicht*), and the random effects were items and participants. The results show that speakers have a general preference for unstressed *auch* (81%) if the AC is the object. Crucially, while the preference for unstressed *auch* does not differ between condition 1 (*nur*) and 2 (*kein*) ($\beta = -0.01$, $SE = 0.38$, $t = -0.04$), it differs significantly between condition 1 (*nur*) and 3 (*nicht*) ($\beta = -0.96$, $SE = 0.36$, $t = -2.68$, $p = .007$), and between condition 2 (*kein*) and 3 (*nicht*) ($\beta = -0.98$, $SE = 0.35$, $t = -2.72$, $p = .007$) (see Figure 2).

Figure 2



That *nur* and *kein* show a similar pattern and that both differ from *nicht* indicates that the shared surface structure has an influence on the choice of the two variants of the particle *auch*, and that speakers are primed by structural properties of the context. Crucially, the presence of *nicht* in the context with the word order [AC + X] leads speakers to use more stressed *AUCH* (against their actual preference to use unstressed *auch* if the AC is the object).

3 Experiment 2

3.1 Methods

To make sure that it is the structure [AC+ X] that lead speakers to use stressed *AUCH* and not the typical intonational contour that is related to *AUCH* and that might have been silently activated while reading the sentences, participants were not presented with the context sentences in written form, but auditorily. We included the conditions *kein* [X + AC] and *nicht* [AC + X] and manipulated the pitch accent of the AC and the negated element in the context (see 3 and 4). 44 native speakers participated in the experiment.

- (3) A: Peter hat Äpfel gegessen. 'Peter ate apples'
 B: Ich wette, Peter hat /keiNE BIRnen\ gegessen. → L*+H H+L* (hat pattern)
 B': Ich wette, Peter hat KEIne BIRnen gegessen. → H* H* (double-peak)
 'I bet Peter didn't eat any pears.'
- (4) A: Peter hat die Äpfel gegessen. 'Peter ate apples.'
 B: Ich wette, Peter hat die /BirNEN NICHT\ gegessen. → L*+H H+L* (hat pattern)
 B': Ich wette, Peter hat die BIRnen NICHT gegessen. → H* H* (double-peak)
 'I bet Peter didn't eat any pears.'

3.2 Results

The results show a main effect of negated element in the context: As in Experiment 1, the presence of *kein* led to more uses of unstressed *auch* than the presence of *nicht* ($\beta = -1.09$, $SE = 0.18$, $t = -5.91$, $p < .001$). Crucially, there was no effect of intonational contour and no interaction ($p > .05$), indicating that the prosodic information of the context did not influence speakers when choosing between the two variants of *auch*.

