



Another additive particle under stress: German additive *noch*

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1 Introduction

German *noch* ‘still’ is a focus particle which is commonly said to have four readings, a temporal reading, a marginality reading, an additive reading and a comparative reading.¹ The temporal reading, in (1), has been investigated in depth focusing on the duality of *noch/still* and *schon/already* (cf., e.g., Löbner 1989; König 1991; Krifka 2000). The marginality reading, in (2), is considered as derived from the temporal reading by a shift of scale. There is, however, no proposal in the literature on how to interpret the additive and the comparative readings of *noch*, cf. (3) and (4).²

- (1) *Es regnet noch.*
‘It is still raining.’
- (2) *Osnabrück liegt (gerade) noch in Niedersachsen.*
‘Osnabrück is still in Lower Saxony.’
- (3) a. *Otto hat noch einen SCHNAPS getrunken.*
‘Otto had a schnaps in addition.’
b. *Otto hat NOCH einen Schnaps getrunken.*
‘Otto had another schnaps.’
- (4) *Berta ist NOCH größer als Adam.*
‘Berta is still/even taller than Adam.’

The additive reading of *noch* occurs in two variants, unstressed and stressed. If the particle is unstressed the associated constituent carries an accent. In (3a), for example, *noch* is associated with *einen SCHNAPS* ‘a schnaps’ expressing that Otto had a schnaps in addition to some other previously mentioned drink. If the particle is stressed, the associated phrase will be deaccented, cf. (3b). In this variant it is expressed that Otto had another schnaps, in addition to a previously mentioned one. The comparative reading, in (4), mostly occurs with an accent on the particle. It implies that there is an additional comparison stating that Adam is tall or taller than someone else.

A semantic analysis of additive *noch* must address three questions. First, what is the difference between additive *noch* and the paradigm additive particle *auch* ‘also, too’ — what does it mean for *noch* to be “additive”? Secondly, how to explain the accent on *noch* and the difference in meaning between the unstressed and the stressed variant? And finally, how does the additive reading relate to the other readings of *noch*? It will be argued in **section 2** that *noch*, in contrast to *auch*, is scalar, even in the additive reading, indicating an enumeration, while *auch* marks a mere supplement. The accent on

¹I would like to thank my colleague Cornelia Ebert for helpful discussion and convincing examples/counterexamples, and one anonymous referee for to-the-point comments.

²This is not surprising, since English *still* doesn’t have the additive reading in (3). Note, however, that there are diverging notions of additivity. Ippolito (2007), for example, claims that English *still* is always additive, cf. **section 4**. In the examples additive *noch* will be glossed by *in addition/another*.

noch will be explained in **section 3** by deaccenting requirements instead of interpreting it as a focus. In **section 4** an interpretation of additive *noch* will be provided reducing the difference between the additive reading and the temporal reading to the nature of the underlying scale — while the temporal reading relates to the order of time, the additive reading relates to the order of mentioning —, thereby yielding a uniform interpretation of *noch* as a scalar focus particle.³ The comparative reading of *noch* is shown to be an instance of the additive reading in Umbach (2009) and will only be briefly mentioned in the concluding section.

2 *Auch* vs. *noch* — supplement vs. enumeration

Similar to the additive *noch*, the additive particle *auch* occurs unstressed as well as stressed. The unstressed forms of *auch* and *noch* are very close in meaning. First, they are both focus-sensitive associated with foci of various categories. In (5), the focus being on the DP, both *auch* and *noch* express that Otto had a schnaps in addition to the beer. Secondly, *auch* and *noch* are anaphoric requiring a previously mentioned antecedent, e.g., the beer in (5). Finally, both *auch* and *noch* are necessary for the additive interpretation because without the particles the sentences would be understood as corrections.

- (5) (*Otto ist beschwipst. Er hat ein Bier getrunken.* ‘Otto is slightly drunk. He had a beer.’)
- a. *Er hat auch einen SCHNAPS getrunken.*
‘He also had a schnaps.’
 - b. *Er hat noch einen SCHNAPS getrunken.*
‘He had a schnaps in addition.’

Although *auch* and *noch* appear interchangeable in (5), there is a subtle difference in meaning, which becomes more obvious in the example in (6). If *auch* in (6a) is replaced by *noch*, the sentence is no longer acceptable in the context of the preceding sentence, cf. (6b). It will only be acceptable if the adverbial *dann* ‘then’ is added, cf. (6c). *Dann* is a temporal adverb introducing a sequence of events, and can be shifted to a metalinguistic interpretation relating to the sequence of mentioning in discourse. Since the sentences in (6) are stative, *dann* in (6c) must be interpreted with respect to the sequence of mentioning. In this context *noch* instead of *auch* is fully acceptable.

- (6) (*Isabelle ist sehr hübsch.* ‘Isabelle is very pretty.’)
- a. *Sie ist auch klug.*
‘She is also clever.’
 - b. *≠ Sie ist noch klug.*
‘She is clever in addition.’
 - c. *Dann ist sie noch klug.*
‘Then she is clever in addition.’

It is generally held that additive particles presuppose an alternative antecedent, that is, an element of the focus meaning which has been mentioned before (cf. Rooth 1992; Krifka 1999; Sæbø 2004). For example, in (5a) the alternative set triggered by the focus will consist of {*Otto-had-a-schnaps, Otto-had-a-beer, . . .*}, thus including the antecedent proposition. The function of additive particles is described in Krifka (1999) as a means

³It is important to note that the notion of *scalar* in this paper is not restricted to likeliness as, e.g., expressed by *even*.

“to get around the distinctiveness constraint”, where distinctiveness is a characteristic of a sequence of sentences with contrastive topics, and follows from the Gricean maxim of manner. The basic idea is demonstrated in (7) (= (48) in Krifka 1999). The answer B' in (7) is preferred over the answer B because it is shorter. But the answer B'' is equally acceptable, showing that stressed *too* allows the speaker to violate the maxim of manner.⁴

- (7) A: *What did Peter and Pia eat?*
 B: */PETER ate \PASTA and /PIA ate \PASTA.
 B': *Peter and Pia ate \PASTA.*
 B'': /PETER ate \PASTA and /PIA ate *pasta*, \TOO.

Krifka's idea of the function of additive particles in that paper is confined to the stressed form. It seems safe, however, to generalize it to the unstressed form maintaining that the basic function of the additive particle *auch* consists in licensing a proposition which could — and should, according to Grice — have been integrated in the previous one. In (5a), for example, the speaker could have uttered right away *Otto hat ein Bier und einen Schnaps getrunken* ‘Otto had a beer and a schnaps’ instead of subsequently adding that Otto had a schnaps. From this point of view, additive *auch* offers a repair strategy to pick up a previous predication and add another element for which the predication holds. This is why *auch* sentences frequently give the impression of a supplement.⁵

Noch sentences, however, do not give the impression of a supplement. The speaker does not add items as an afterthought, but instead enumerates them, one after the other.⁶ The enumeration effect is easily explained when taking into account that *noch* is a scalar particle, thus relating to, or inducing, an order. The order can be temporal but it can also be some other order relevant in the context. In the case of additive *noch* it seems plausible to assume that the order is the order of mentioning in discourse (that is, “discourse time”), which trivially determines the order of the enumeration. This supposition is supported by the fact that additive *noch* is perfect in the context of metalinguistic *dann* ‘then’, cf. (6). Additional evidence is provided by the observation that questions propelling the discourse, as in (8), must make use of *noch* instead of *auch* ((8b) can only be understood as a reprise question asking the hearer to repeat his utterance).

- (8) a. *Was ist noch passiert?*
 ‘What happened in addition?’
 b. ?? *Was ist auch passiert?*
 ‘What happened also?’

The above findings reveal a subtle difference in interpretation: While *auch* marks a supplement belatedly adding an item, *noch* induces an enumeration listing items one by one. This difference can be accounted for by assuming that the set of alternatives *noch* relates to is ordered. While in the case of *auch* alternatives constitute a regular (unordered) set, in the case of *noch* alternatives constitute a list. The idea that *noch* imposes an order on the set of alternatives, which has already been proposed in Krifka (2000) for temporal *noch*, explains the difference between unstressed *auch* and *noch* and will, moreover, be essential for the interpretation of stressed additive *noch*.

⁴Slashes and backslashes indicate rising and falling accents.

⁵This is not the case when *auch* is combined with *aber* ‘but’, cf. Umbach (2005).

⁶Similarly, König (1991: 152) suggests that *noch* in contrast to *auch* triggers the implicature that what is at issue is an exhaustive enumeration.

3 Stressed *noch* — how to interpret the accent?

For stressed *auch* and *noch* the difference in meaning is straightforward. Compare (9a) and (9b). In the case of *auch* there has to be another person drinking schnaps, whereas in the case of *noch* there has to be another schnaps Otto drank.

- (9) a. (*Martha hat einen Schnaps getrunken.* ‘Martha had a schnaps.’)
/OTTO hat AUCH *einen Schnaps getrunken.*
‘Otto had a schnaps, too.’
- b. (*Otto hat nach dem Essen einen Schnaps getrunken, und du glaubst es nicht:*
‘Otto had a schnaps after dinner, and you won’t believe it:’)
Otto hat NOCH einen Schnaps getrunken.
‘Otto had another schnaps.’

Following Krifka (1999), stressed *auch* is associated with a contrastive topic, e.g., /OTTO in (9a), denoting the additional item. Stressed *noch*, in contrast, must be associated with the adjacent phrase, e.g., *einen Schnaps* in (9b), since this is the phrase denoting the additional item. But there is a severe problem from the point of view of focus semantics: the associated constituent does not carry an accent. We will have to assume a focus without an accent (or otherwise give up the idea that *noch* is focus-sensitive, which doesn’t seem plausible).

In addition to assuming a focus without an accent, we have to provide an explanation for the accent on *noch* — what does it indicate? In Krifka (1999) stressed *auch* in, e.g., (9a) is considered as a focus expressing affirmation, the alternatives being affirmation and denial. Unfortunately, this interpretation is not viable in the case of stressed *noch*. Suppose we consider stressed *noch* as a focus triggering an alternative set consisting of affirmation and denial. Then the alternatives in (9b) would be {Otto-did-drink-a-schnaps, Otto-did-not-drink-a-schnaps}, where the second one contradicts the preceding context. But since alternatives represent propositions which could have been uttered instead of the asserted one, they must be consistent with the preceding context. Therefore, the accent on *noch* cannot be interpreted as a focus triggering the alternatives affirmation and denial.

There is another option: Féry (2006) suggests that in the case of stressed *auch* the particle is the only place the accent can be located because any other position must be deaccented. Neither *Schnaps* nor *getrunken* in (9a) can carry a (focus) accent due to previous mentioning, leaving *auch* as the only place where the accent can go. Moreover, Féry claims that stressed *auch* just serves as an “accent holder” without an additive meaning in these contexts, but her argument appears questionable.⁷ We will adopt the idea of accent shifting due to deaccenting requirements for stressed *noch*, while maintaining that it has an additive meaning in this context. We will thus assume that the accent on *noch* in (9b) does not indicate a focus, but is a makeshift instead — the DP associated with *noch* in (9b) cannot carry an accent because it occurred in the previous sentence. Still, the DP is focused, and the focus triggers alternatives, in the case of (9b) {Otto-had-a-schnaps, Otto-had-another-schnaps}.⁸

⁷She presents an example where (in the relevant reading) the anaphor is embedded under *believe* and is false, while the antecedent is not embedded and true. I don’t see a reason why such a situation has to be ruled out for an additive particle. Additive particles do not trigger presuppositions but instead operate on alternatives and antecedents and are less restricted with respect to accessibility, cf., e.g., Büring (2004).

⁸Similar effects have been observed with so-called **second occurrence foci** raising the question of whether there are foci without accents (cf. Partee 1999). Note, however, that assuming a focus on the

Alternative sets normally consist of elements which are distinguished by their kind or description, e.g., {a-beer, a-schnaps}. In the case of stressed *noch*, however, the alternative set consists of elements of the same kind, {a-schnaps, another-schnaps}. This of course follows from the fact that the antecedent is of the same kind, which was the reason for deaccenting. Still, we would like an explanation why stressed *noch*, in contrast to stressed *auch*, facilitates such an alternative set. Why does *noch*, but not *auch*, license elements of the same kind or description in the alternative set it operates on? The answer is obvious when taking into account that *noch*, unlike *auch*, operates on a list of alternatives instead of an unordered set, cf. **section 2**. The elements of a set must be distinct by their description. But the elements of a list are distinct by their position. Therefore, identically described elements are no problem.

The scalar nature of *noch* facilitates alternatives of the same kind or description. Alternatives must of course not be referentially identical. Therefore, definite NPs are licensed by unstressed *noch* only if they allow for a novel or contrastive interpretation, as shown in (10a). They are completely ruled out by stressed *noch*, cf. (10b), where they would inevitably refer to the referent of the previously mentioned same kind constituent, i.e., the schnaps introduced in the context sentence.⁹

- (10) (*Otto hat einen Schnaps getrunken*. ‘Otto had a schnaps.’)
- a. *Dann hat Otto noch den CHAMPAGNER/# den SCHNAPS getrunken*.
‘Then Otto had the champagne/the schnaps in addition.’
 - b. *# Dann hat Otto NOCH den Schnaps getrunken*.
‘Then Otto had the schnaps in addition.’

4 The semantics of additive *noch*

The temporal reading of *noch* (as well as English *still*) is commonly interpreted such that it carries a “past presupposition” stating that there is a time before the reference time such that the proposition modified by *noch* holds (continuously) until reference time, cf., e.g., Löbner (1989).¹⁰ For example, *Es regnet noch* ‘It is still raining’ presupposes that it has been raining before (and there was no break until now). In Krifka (2000) the meaning of temporal *noch* is rephrased in a focus semantic framework. The basic idea is that the alternatives exploited by *noch* are ranked according to the order of time. The focus is required to be the minimal element, thereby excluding lower ranked alternatives (relating to previous time points) from the alternative set.¹¹ The minimality requirement for the focused element leads to a restriction of the alternative set capturing the implicature of temporal *noch* that things will change, e.g., in the above example, that it might soon stop raining.

Adopting Krifka’s proposal for additive *noch* seems straightforward — alternatives will be ranked according to the order of mentioning instead of the order of time. Howev-

constituent associated with stressed *noch* does not imply that foci can arbitrarily occur without accents. Note also that this solution cannot be transferred to stressed *auch*, since stressed *auch* is not associated with the (deaccented) focus but instead with the contrastive topic.

⁹A novelty condition, as suggested by one referee, would not be sufficient because in the case of accented *noch* the referent must not only be novel but also of the same kind or description.

¹⁰Similarly, Ippolito (2007) claims for the temporal as well as the marginality reading of English *still* that it triggers such a presupposition, which is the reason why she calls these readings additive (“presupposing an additional item”).

¹¹Krifka’s account is spelled out for English *still* and its dual *already*. In the case of *already* the focus is required to be the maximal element.

er, the minimality constraint poses a serious problem because it excludes the antecedent required by additive *noch* from the set of alternatives. Regardless of whether we consider the unstressed or the stressed variant, the antecedent will be ranked lower than the focused element (that is, $\text{Otto-had-a-beer} <_{\text{mention}} \text{Otto-had-a-schnaps}$ in (5b), and $\text{Otto-had-a-schnaps}_1 <_{\text{mention}} \text{Otto-had-a-schnaps}_2$ in (9b)), simply because it is an antecedent.

In shifting from the temporal scale to the scale of mentioning the antecedent required by additive *noch* corresponds to the “past presupposition” of temporal *noch*. For the “past presupposition” exclusion from the alternative set may be acceptable (Krifka does not comment on this consequence of the minimality constraint for focus). It is clearly not acceptable for the antecedent required by additive *noch* because the antecedent is constitutive for additive particles. So do we have to give up the requirement that the focus is ranked lower than the rest of the alternatives? That depends on what we consider alternatives to be. From the alternative semantics point of view, alternatives first include any expression of the appropriate type substituted for the focused item and are a posteriori restricted by the context. One constraint has been mentioned when rejecting the idea that accented *noch* is a focus, where it was argued that alternatives must be consistent with the context. Krifka seems to maintain an even narrower notion taking alternatives to be “assertions that, given the common ground and the informational interest of the interlocutors, could have been made at the current point of conversations.” (Krifka 2000). Due to the general informativity requirement, this conception excludes alternatives which have already been realized in the discourse, for example the antecedent alternative in the case of additive *noch*.

There are three options to handle the problem of the minimality requirement: (i) the minimality requirement is cancelled for additive *noch*, while retaining the requirement that alternative sets are ordered; (ii) the minimality requirement is constrained to a subset of *open alternatives*; (iii) the minimality requirement is cancelled for all readings (leaving open the question of how to explain the implicatures of temporal *noch*). The first option is not attractive, since it would give up the idea of a uniform analysis of *noch*. The third option is beyond the scope of this paper. The second option is not attractive either, but it will do for the time being.

Let us call alternatives that can be realized at a certain point in discourse (given the current common ground of the interlocutors) **open alternatives**. The set of alternatives is supposed to be ordered and indexed allowing for elements of the same kind/description (that is, it is a list). The set of open alternatives is a subset such that the order is preserved, and the focus is the minimal element. The meaning of additive *noch* — stressed or unstressed — can then be spelled out as shown in (11).

- (11) $\llbracket \text{noch } \alpha \rrbracket^o = \llbracket \alpha \rrbracket^o$, presupposing
- (i) $x <_A \llbracket \alpha \rrbracket^o$, where $x \in \llbracket \alpha \rrbracket^F$ and has to be bound on update;
 - (ii) $\forall y \in \text{openAlt}(\alpha) [\llbracket \alpha \rrbracket^o <_A y]$,
- where $\text{openAlt}(\alpha) \subseteq \llbracket \alpha \rrbracket^F$, and $<_A$ represents the order of alternatives, which is aligned with the order of mentioning, $<_{\text{mention}}$.

The crucial question is, of course, whether the interpretation in (11) is sufficiently general to include the temporal (and the marginality) reading of *noch*. Can we simply substitute the temporal order for the order of mentioning in (11)? If we do, we will have to assume that “past presupposition” triggered by temporal *noch* is a member of the

alternative set, which seems plausible (provided type shifting). There is, however, an empirical obstacle: Even if we choose the presuppositions-as-anaphors framework of van der Sandt (1992), the antecedent of additive *noch* differs from the presupposition triggered by temporal *noch* in that the former cannot be accommodated, and is subject to more liberal accessibility conditions (cf. Zeevat 2004). The difference between temporal *noch* and additive *noch* with respect to binding conditions must be preserved in interpretation.

5 Conclusion

Additivity is viewed in this paper as being based on anaphoricity — an additive reading of a particle must require an antecedent. This is a stricter view than, for example, the one in Ippolito (2007), who claims that English *still* is additive (plus temporal) by virtue of its presupposition. It has been argued in this paper that the additive reading and the temporal reading of *noch* differ in the nature of the underlying scale. While the temporal reading relates to the order of time, the additive reading relates to the order of mentioning in discourse. The “past presupposition” commonly assumed for temporal *noch* in the literature recurs in the additive reading in the form of the antecedent. The semantics of additive *noch* presented in the paper is based on ordered sets of alternatives, which have been proposed in Krifka (2000) for the interpretation of the temporal reading and turned out to be ideally suited for the additive reading, since they reflect the enumeration effect distinguishing additive *noch* from the paradigm additive particle *auch* ‘also/too’. The puzzle of how to interpret the accent on *noch* has been solved along the lines of Féry’s proposal to attribute it to deaccenting requirements (Féry 2006).

One of the (many) open questions concerning the contrast between *auch* and *noch* are cases where they concur, as in (12). If there is an intonational break between *auch* and *noch*, there must have been at least four sandwiches, but without a break two sandwiches would be enough. On the former interpretation, the meanings of *auch* and *noch* are combined compositionally, while the latter interpretation seems non-compositional, raising the question of how to interpret a non-compositional unit *auch-noch*.

- (12) *Martha hat AUCH noch ein Brötchen gegessen.*
 ‘Martha also in addition had a sandwich.’

Additive *noch* has been said to relate to the order of mentioning. The order of mentioning is, however, frequently aligned with a secondary “meaningful” order. One particularly interesting secondary order is the order of degrees relevant in the case of the comparative reading of *noch*, as in (13). As shown Umbach (2009), the comparative reading is an instance of the additive reading requiring an antecedent.¹² But the item added by *noch* is a comparative relation instead of an object or event. Assuming that the order of mentioning is aligned to the order of degrees, it can be explained why *noch* in (13) is not acceptable and has to be substituted by *auch*.

- (13) *Chris ist größer als Adam. Berta ist # NOCH/AUCH größer als Adam.*
 ‘Chris is taller than Adam. Berta is still/also taller than Adam.’

Another secondary order frequently aligned with the order of mentioning is the temporal order, for example, in narratives. This leads to ambiguities when world knowledge

¹²Comparatives modified by *noch* may entail that the positive form holds for the comparison subject, which is at first sight surprising, because it is not entailed by unmodified comparatives, but turns out to be triggered by the antecedent.

suggests a temporal reading, and at the same time there is a suitable antecedent licensing the additive reading, as in (14a), where *noch* appears ambiguous between a temporal reading and an additive reading with a secondary temporal order. More than that, *noch* can even be stressed given a suitable antecedent, although we would clearly opt for a temporal interpretation, cf. (14b).

- (14) a. (*Es hat gewittert*) und es REGNET *noch*.
 ‘There was a thunderstorm and it is still raining.’
 b. (*Es hat den ganzen Tag geregnet,*) und es regnet NOCH.
 ‘It rained all day and it is still raining.’

To conclude, the analysis of additive *noch* proposed in this paper accounts for the fact that the order of mentioning closely interacts with meaningful ordering relations on the content level thereby facilitating discourse management.

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