Strategies of additivity: German additive *noch* compared to *auch*[1]

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The German particle *noch* ('still') has an additive reading which differs significantly in meaning and use from the standard German additive particle *auch* ('also'/'too'). In the paper, a semantic and pragmatic analysis will be presented focusing on three core characteristics distinguishing additive *noch* from *auch*: (i) alignment with discourse time, (ii) association with deaccented focus, and (iii) continuation of the question-under-discussion. The analysis will be based on the notion of focus alternatives and make use of a question-based discourse model.

1   Introduction

The German particle *noch* has four readings, a temporal reading, a marginality reading, a comparative reading, and an additive reading. The temporal reading of *noch* is equivalent to (the temporal reading of) English *still* and is commonly interpreted as expressing that the state of affairs described in the sentence held before reference time and might not hold in the future. The sentence in (1), for example, conveys the information that it has been raining before and might stop soon. The temporal reading usually occurs in imperfect sentences, and it is the only reading allowing for *noch* to be positioned in the vorfeld of the sentence. This reading has been investigated in depth in the literature, focusing on the duality of *noch/still* and *schon/already* (cf., e.g., Löbner 1989, König 1991, Krifka 2000, Ippolito 2007).

(1)   Es regnet noch. / Noch regnet es.
          'It is still raining.'

The marginality reading of *noch* expresses prototypicality or degree of membership, and is considered as being derived from the temporal reading by a shift of scale. While in the temporal reading the scale is given by progression in time, it is given by decrease of prototypicality in the marginality reading. In the example in (2), Osnabrück is said to be a marginal case of being positioned in the Lower Saxony territory. If located further away from the center, Osnabrück would be beyond the border. The marginality interpretation is enhanced by adding *gerade* ('just') and is translated into English by *still*.

(2)   Osnabrück liegt (gerade) noch in Niedersachsen.
          'Osnabrück is still in Lower Saxony.'

The comparative reading of *noch,* demonstrated in (3), refers to a scale given by a gradable adjective. In the example in (3) it is expressed that Berta is taller than Adam, who is himself taller than someone else, say Elsi, or taller than the prototypical example in his class, that is, simply tall.[2] This reading is usually translated into English by *even* instead of *still*. König (1971) pointed out that the comparative reading is closely related to the marginality reading, the scale being given by increasing distance from the comparison base, i.e. the size of Elsi or of the prototypical example. This idea is spelt out in Umbach (2009) in terms of semantics of gradability.

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[1] I would like to thank Regine Eckardt, Stefan Hinterwimmer, Henk Zeevat and three anonymous reviewers for very helpful comments on earlier versions of this paper.

[2] Note that (3) may also have a temporal interpretation and a marginality interpretation (*Noch ist Berta größer als Adam / Berta ist gerade noch größer als Adam.* 'Berta is still taller than Adam').

(3)   Berta ist noch größer als Adam.
      'Berta is even taller than Adam.'

This paper focuses on the additive reading of *noch,* which is close in meaning to the German additive particle *auch* ('also', 'too'). Similar to *auch*, it conveys the information that the predication holds for an alternative entity mentioned before, and it occurs in an unstressed and a stressed variant. In the unstressed variant in (4a), *noch* indicates that Otto had a schnaps in addition to some previously mentioned drink, e.g., a beer. In the stressed variant in (4b) the previously mentioned drink has to be another schnaps. The additive reading of *noch* cannot be translated into English by a focus particle – neither *still* nor *even* nor *also/too* are equivalent. Translation is usually provided by *in addition* (unstressed variant) and *another, one more* (stressed variant).

(4)   a. Otto hat noch einen SCHNAPS getrunken.[3]
         'Otto had a schnaps in addition.'
      b. Otto hat NOCH einen Schnaps getrunken.
         'Otto had another schnaps.'

The additive reading of *noch* has been widely ignored in the literature, the only references being König (1991), Nederstigt (2003) and Eckardt (2006). On the other hand there is a broad discussion about the meaning of the paradigm additive particles *also/too* in English and *auch* in German, and about the concept of additivity in general (e.g. Reis & Rosengren 1997, Krifka 1999, Sæbø 2004, Zeevat & Jasinskaja 2007, Tovena & Donazzan 2008, Greenberg 2009). Questions range from the role of focus and the status of presuppositions coming with additive expressions to the lexical type of additive expressions and the semantic type of the entities added. This paper presents an analysis of the additive reading of *noch* as compared to *auch* ('also'). The analysis will address three significant contrasts between additive *noch* and *auch* that characterize the semantics and pragmatics of *noch* from the perspective of focus semantics, information structure and discourse structure: (i) *alignment with discourse time*, (ii) *association with deaccented focus*, and (iii) *continuation of the question-under-discussion*. First, alignment with discourse time is possible for *noch* but impossible for *auch*. This is evident from examples like (5) where in the *noch*-version the temporal adverb *dann* may refer to either real time or discourse time, whereas in the *auch*-version it must refer to real time.

(5)   (Otto hat ein Bier getrunken. 'Otto had a beer.')
      a. Dann hat er noch einen Schnaps getrunken.
      b. Dann hat er auch einen Schnaps getrunken.
         'Then he had a schnaps in addition.'

The second contrast concerns the observation that association with deaccented focus is possible for *noch* but impossible for *auch* without recourse to a contrastive topic. This contrast shows up in the stressed variants.[4] Stressed *NOCH* in (6a) requires a context such that there is another schnaps Otto drank. Substituting *NOCH* by *AUCH* in this context is infelicitous, since stressed *AUCH* would require a context where another person is drinking schnaps. The fact that (6a) describes a 'schnaps-one-plus-schnaps-two' situation, while (6b) describes a 'person-one-plus-Otto' situation will be taken as evidence that stressed *NOCH* is associated with a deaccented focus and the accent on *NOCH* is an emergency solution due to deaccenting requirements.

(6)   (Otto hat einen Schnaps getrunken. Und du glaubst es nicht:
      'Otto had a schnaps. And you won't believe it:')
      a. Er hat NOCH einen Schnaps getrunken.
         'He had another schnaps. '

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b. # Er hat AUCH einen Schnaps getrunken.
   'He had a schnaps, too. '

The third contrast consists in the different roles of additive *noch* and *auch* in discourse management: Continuation of the question-under-discussion is possible for *noch* but marked for *auch*. This is evident from examples like (7a) showing that *noch* can be used to ask for a continuation of the discourse such that the new question-under-discussion differs from the old one only in that the domain under discussion is extended. Using *auch* instead of *noch* results in a particular type of rhetorical question, cf. (7b). We will call such questions 'show master questions' since they presuppose that the speaker already knows the answer.[5]

(7)   a. (Sue informs her mother about what happened during the summer)
         Mother to Sue: Und was ist im Sommer noch passiert?
                          'What else happened in the summer?'

      b. (Little Lisa tells her mother what happened when she visited the zoo with Auntie.)
         Auntie to Lisa: Und was ist im Zoo auch passiert?
                            'What happened in the zoo, too?'

The three characteristics distinguishing additive *noch* from *auch* will be the guideline of the analysis in this paper. The first, alignment with discourse time, will be considered as evidence that additive *noch* induces an order on the set of alternatives – additive *noch* operates on lists while *auch* operates on plain sets. The second characteristic, association with deaccented focus, raises the problem of how to individuate alternatives if they are descriptionally identical – how to individuate the schnapses Otto drank? The problem will be solved by using the indices given by the order on alternatives – schnaps one, schnaps two, etc. The third characteristic, continuation of the question-under-discussion, will also be traced back to the order induced by *noch*. The intuition that *noch* indicates a continuation while *auch* indicates a supplement will be attributed to the fact that in the case of *noch* additional alternatives can only be added by list concatenation while in the case of *auch* they can be added by set union. Finally, the show master effect in (7b) will be explained by the need for a contrastive topic.

The structure of the paper is as follows: In section 2, the relevant proposals in the literature will be reviewed, in particular the account of additive *noch* in Eckardt (2006) and the account of stressed additives in Krifka (1999) together with Féry's (2010) deaccentuation hypothesis. In section 3, an interpretation for additive *noch* will be presented focusing on the order given by discourse time. In section 4, an analysis of stressed additive *NOCH* will be provided such that stressed *NOCH* is associated with a deaccented focus. This analysis raises the question whether it can be adapted for stressed *AUCH*, which has to be denied. Still, an analogous solution making use of split foci will be sketched at the end of section 4. In section 5, the distributional differences between additive *noch* and *auch* in questions will be explored in order to examine their role in discourse management.

2 Additive *noch* and *auch* in the literature

2.1 Additive *noch*

The additive use of *noch* was considered as basic for all uses of *noch* in Doherty's (1973) presuppositional analysis of *noch* and *schon* – "… the mere additive function of […] *noch* referring to the repeated occurrence of things […] lies at the bottom of all the various *nochs.*" (p. 158). König (1991), who describes *noch* as both additive ("adding up to a larger whole") and scalar ("ranking elements along a scale"), rejects Doherty's idea of subsuming all uses of *noch* under the notion of additivity, because it fails to account for the duality of *noch* and *schon*. The dual relation of *noch / schon* and *still / already* – being related by inner and outer

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[5] Many thanks to Regine Eckardt for suggesting this term.

negation – was pointed out in Löbner (1989) and was a core issue in the literature on *noch* since then. Löbner focuses on the temporal use of *noch* and considers the additive use as resulting from a mere shift of scale. Krifka (2000) proposes an analysis of temporal *noch* as a focus sensitive particle imposing an order on the set of alternatives and suggests that the order can be provided by other sources in addition to time, e.g. number. The interpretation of additive *noch* suggested in section 3.2 will be based on Krifka's analysis. The idea that additivity is the basic concept re-emerges in Ippolito (2007) where English *still* in its temporal and marginality uses are said to be additive, similar to *too* and *also*. But since English *still* doesn't have a genuine additive use, Ippolito's claim remains vague.

Nederstigt (2003) presents a comprehensive study of German *auch* and *noch* in language acquisition including corpus data on the usage of *auch* and *noch* in adult German. In addition to the "pure additive" uses (as, e.g., in 4a,b in the introduction) there are, according to Nederstigt, two more additive uses. In the first usage, *noch* is combined with *mal* ('times'), which is a light noun denoting events. The compound *nochmal* indicates that the additional items are events thereby distinguishing addition of events from addition of individuals – *Otto hat NOCHmal einen Schnaps getrunken* means that Otto drank a schnaps again, whereas *Otto hat NOCH einen Schnaps getrunken* means that Otto had another schnaps. In the present paper *nochmal* will be subsumed under the additive reading of *noch,* and will only be discussed in the conclusion. The second usage of *noch* beyond the pure additive ones is characterized as "additive before a turning point", as in "*Also davor hab ich noch einen Termin*" 'I have *noch* an appointment before.' (Nederstigt 2003, p. 101, Verbmobil corpus). These cases differ from pure additive ones in that they can be uttered out of the blue and allow for accommodation of the additional item, which is not allowed in the pure cases, cf. section 2.2 below. In the present paper these cases are viewed as temporal readings and set aside. The pure additive uses of *noch* are according to Nederstigt equivalent in meaning to *auch*, even if a uniform interpretation is precluded by their substantial differences in syntax and intonation pattern.

The only formal analysis of additive *noch* available in the literature is Eckardt (2006). Eckardt calls this use *discourse-based noch*, but we will keep the term *additive noch* in order to highlight its closeness in meaning to additive particles like *auch* and *also/too.* Eckardt starts from the idea that additive *noch* is analogous to temporal *noch*, the temporal order being substituted by the order of mentioning in discourse. For temporal *noch* she adopts Löbner's analysis according to which the sentence *Das Kind schläft noch* 'The child is still sleeping.' is interpreted such that

(9) a. The sentence refers to a specific reference time t_r which is in a reference interval I_r.

b. The sentence presupposes that there is a time t in I_r such that
    $\forall t'$ (t' < t $\leftrightarrow$ [[das Kind schläft]] is true at t').

c. The sentence asserts that t_r is before the time of switching t.   (cf. Eckardt 2006, p.1)

Eckard lists three features distinguishing additive *noch* from the standard additive particle *auch*: (i) alignment with the order of mentioning, (ii) the existence of a negative phase, and (iii) a fixed and stable reference domain under discussion. The first feature is taken for granted, the second and the third are justified by the examples in (10) and (11). The sentences in (10) (= Eckardt's 12, 13) are supposed to answer the question "Who out of Tick, Trick and Track (i.e. Huey, Dewey, and Louie) can swim?". The markedness of (10b) in contrast to (10a) is explained by the expectation of a negative phase, that is, negative instances following the list of positive instances. This expectation is not triggered by *auch*, which is why (10c) is fine. The example in (11) (= Eckardt's 15) is said to be odd because there is no reasonable criterion integrating the number 78 into the list of previous numbers. *Auch*, in contrast to *noch*, would be fine because it doesn't require such a fixed search domain.

(10) a. Tick kann schwimmen, und TRICK kann noch schwimmen, (aber) Track kann nicht schwimmen.
      b. #Tick kann schwimmen, und TRICK kann noch schwimmen, und TRACK kann noch schwimmen.
          'Tick can swim, and Trick can *noch* swim, (but) Track cannot swim / and Track can *noch* swim.'
      c. Tick kann schwimmen, und TRICK kann AUCH schwimmen, und TRACK kann AUCH schwimmen.
          'Tick can swim, and Trick can *auch* swim, and Track can *auch* swim.'

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(11)   2 ist eine gerade Zahl, 4 ist noch gerade, 6 ist noch gerade, #78 ist noch gerade, ...
        '2 is an even number, 4 is *noch* even, 6 is *noch* even, 78 is *noch* even …'

The semantics of additive *noch* suggested by Eckardt is given in (12) (= Eckardt's 14). It makes use of the idea of ordered alternatives, similar to Krifka (2000), and implements the features (i) – (iii) listed above, yielding an interpretation of additive *noch* analogous to temporal *noch* (cf. 9): The order of real time for temporal *noch* corresponds to the order of discourse time for additive *noch*. The reference interval under consideration in the case of temporal *noch* corresponds to the fixed domain under debate in the case of additive *noch*. The presupposition that the state of affairs expressed in the sentence has been true in previous times corresponds to the presupposition that an alternative of the sentence has been asserted previously in discourse, and, finally, the switch to a negative phase within the interval under consideration (i.e. one where the negated state of affairs holds) corresponds to the requirement of an alternative from which on the sentence is false for subsequent alternatives.

(12)   *noch* + S associates with focus.
        Let A be the focussed element in S. The sentence presupposes that
        a. Alt(A) is a restricted and fixed reference domain under debate,
        b. one or more alternatives q $\in$ [[S]]^f were asserted in the last utterances in discourse,
        c. there is a specific order on Alt(A) such that for all A', A" $\leq$ A,
            the assertion [[S]](A'/A) was made before [[S]](A"/A) iff A'<A",[6]
        d. there is some alternative C such that C$\leq$A' iff ¬[[S]](A'/A) holds true.
        The sentence asserts its content under ordinary semantic evaluation.

In addition to the semantic characterization above, Eckardt spells out the discourse pragmatic function of additive *noch* in a question-based discourse model following Roberts (1996), where utterances constitute answers to explicit or implicit questions in a hierarchy of subquestions. To this end, Eckardt defines the notion of a *remnant question* which is a question subsuming the open subquestions of its superquestion, cf. (13) (=Eckardt's 29). The idea is demonstrated in fig. 1. Based on the notion of the remnant question the conditions of use of *noch* in assertions and questions are spelt out as shown in (14) (= Eckardt's 34, 35).

(13)   Remnant question: A question R is the remnant question to a question Q in context C iff R is a subquestion to Q in the empty context, and a complete answer to R in context C is a complete answer to Q in C.[7]
(14)   Use of *noch* in questions: A question q in a question-answer-discourse QAD licenses *noch* iff it is a remnant question, it is dominated by a question Q such that there are assertions between Q and q, and all assertions between Q and q are positive answers to Q.
        Use of *noch* in assertions: An assertion u in a QAD licenses *noch* iff u is a positive answer to its dominating question q, and q licenses *noch*.

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[6] [[S]](A'/A) denotes the proposition resulting from replacing the focused constituent A by its alternative A'.

[7] The notions of answerhood, complete/partial answer and subquestion are defined as shown below (Eckardt's 25-28):
   — **Answerhood** in a given context: An assertion S constitutes an answer to a question <P,A> in a given discourse
      context C iff for at least one $a \in A$, the augmented context C+[[S]] $|= P(a)$ or C+ [[S]] $|= ¬P(a)$.
   — **Complete answer** to question <P,A> in context C: An assertion S is a complete answer to <P,A> in C iff for all a in
      A, C+[[S]] $|= P(a)$ or C+[[S]] $|= ¬P(a)$.
   — **Partial answer**: An assertion S is a partial answer to Q = <P,A> in C iff S is an answer, but not a complete answer
      to Q.
   — **Subquestion** of a question Q in context C: A question Q' is a subquestion of Q in context C iff a complete answer
      to Q' in C is a partial answer to Q in C.
      Specifically, the following types of question-subquestion relations hold against the empty context:
      If <P, A> is a question and A' $\subset$ A, then <P, A'> is a subquestion of <P,A> against the empty context.
      If Q is a Wh-question <P, A> and Q' is a yes-no question for P about one a $\in$ A: Q' = <λF.F($^\wedge$P(a)), {λp.p, λp.¬p}>,
      then Q' is a subquestion of Q in the empty context.

Wer kann schwimmen? – out of {Anna, Else, Paula}
'who can swim?'

Anna kann schwimmen.
'Anna can swim.'

Wer kann noch schwimmen? – out of {Else, Paula}
'who can *noch* swim?'

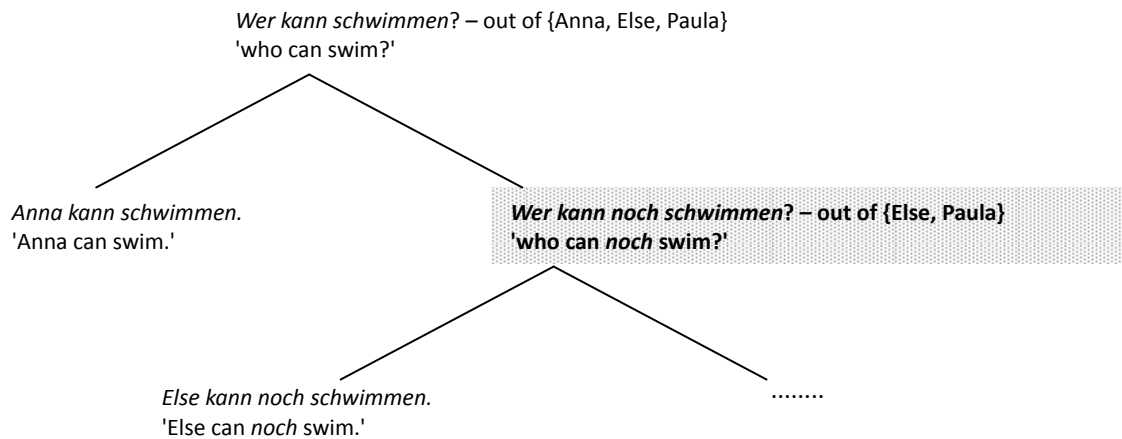*Else kann noch schwimmen.*
'Else can *noch* swim.'

....

Fig. 1 The hightlighted question is remnant with respect to the top question.

Although a uniform analysis of the temporal and the additive reading of *noch* would be preferable, Eckardt's approach has a number of problems: First, the evidence for a negative phase is not mandatory. If additive *noch* requires a negative phase, why is the effect canceled by adding *auch*? – *Tick kann schwimmen, und TRICK kann noch schwimmen, und TRACK kann auch noch schwimmen* 'Tick can swim, and Trick can *noch* swim, and Track can *auch noch* swim.' would be perfect as an answer (cf. 10). Actually, even in the case of temporal *noch* the switch to a negative phase is not obligatory, as already pointed out in König (1977). [8] Secondly, the idea of a fixed domain is not compatible with the effect in, e.g., (7a) where *noch* is used to extend the domain under discussion. Thirdly, the notion of the remnant question, although handy when describing discourse management, doesn't distinguish additive *noch* from *auch*. This will be shown in section 5. Finally, Eckardt's account doesn't include stressed occurrences of *noch* and *auch*, which will turn out to be crucial to capture the difference between the two particles.

2.2 Non-scalar and scalar additives

Additive *noch* is called scalar-additive in König (1991) because there is a scale involved, reflecting the order of mentioning in discourse. The standard scalar-additive particle, however, is *even/sogar*, relating to the scale of likelihood. This raises the question of how scalar additivity as expressed by *noch* compares to scalar additivity expressed by *even/sogar*. One straightforward answer would be that both relate to scales, but to different ones. There are indications, however, that discourse-based additive-scalars like *noch* and likelihood-based additive-scalars like *even/sogar* have characteristics in common beyond the mere scale (see Beaver & Clark's hypothesis below).

Tovena (2006) investigates the Italian focus particle *neanche* which exhibits a pure additive as well as a scalar-additive reading, where the latter expresses likelihood, like English *even*. While in the pure additive reading of *neanche* alternatives may, but need not, be ordered, the order is obligatory in the scalar-additive reading. Tovena's account is based on two observations relevant here: First, if the presupposition concerning the additional alternative is verified by the context, both readings are available for *neanche*. But if the presupposition is accommodated, the likelihood reading is mandatory. That is, *neanche* can only be used out of the blue if interpreted as *even*, whereas a pure additive reading requires access to the previous discourse. Secondly, Tovena discusses the nature of the alternative set and distinguishes between 'potential alternatives', corresponding the focus semantic value in Rooth (1992) and 'actual alternatives' corresponding to Rooth's C set, which is a subset of the focus semantic value. She then points out that the constituent associated with a (scalar-)additive focus particle must be maximal in the set of actual

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[8] *König Konstantin lebt noch im Exil und das wird wohl auch so bleiben.* 'King Constantine is still living in exile, and that is the way it will always be.' (König 1977, p.176).

alternatives (with respect to the order imposed by *neanche*). This will also apply to additive *noch*, cf. section 3.2.

Beaver & Clark (2008) suggest a slightly different view on scalar-additives. They employ the notion of expectations and propose the following characterization: Scalar-additives, like *even*, comment on an overly weak expectation and suggest something stronger than has been assumed or stated before. In contrast, scalar-exclusives, like *only*, comment on an overly strong expectation and suggest a weaker answer than expected. While scalar-exclusives indicate downward monotonicity by imposing an upper bound on what can truthfully be asserted, scalar-additives indicate upward monotonicity by removing an upper bound that has falsely been assumed.

Comparing scalar-additive *even* to scalar-additive *noch* there are two points to note: It's not the case that, as suggested by Tovena, scalar-additives generally admit for accommodation. *Noch* does not, and instead behaves like non-scalar additives in requiring a previously asserted or at least highly salient alternative item making the proposition true – the mere existence of an alternative item would not be sufficient, cf. the discussion in Beaver & Zeevat (2007). This constraint is captured in Beaver & Clark by requiring that the current question has already been partially answered, the answer providing the presupposed proposition. The additional answer is thus an answer to a remnant question in the sense of Eckardt. The second point relates to the claim in Beaver & Clark that scalar-additives remove a falsely assumed upper bound. The analysis in section 5 will support this claim showing that the scalar-additive *noch* extends the domain under discussion thereby removing a previously (falsely?) assumed upper bound.

2.3 Stressed *AUCH*

It is generally agreed that additive particles are associated with focus. In (16a) the focus is on *einen Schnaps*, which is indicated by the accent on *Schnaps*, and *einen Schnaps* is the constituent *auch* is associated with. Additive particles can themselves carry accents. This raises the question of what the associated constituent is in the case of stressed *AUCH*. The standard solution, suggested in Krifka (1999), consists in assuming that a stressed additive particle is associated with the contrastive topic of the sentence in which it occurs. Contrastive topics mostly carry a rising accent, which is considered as indicating a focus in the topic part of the sentence and trigger topic alternatives. The accent on the additive particle itself is, according to Krifka, the focus in the comment part and is interpreted as a verum focus, the alternatives being affirmation and denial, cf. (16b). [9]

(16) a. Otto hat auch [einen SCHNAPS]$_F$ getrunken.
          'Otto also drank a schnaps.'

      b. /OTTO$_{CT}$ hat \AUCH$_F$ einen Schnaps getrunken.
          'Otto drank a schnaps, too. '

Concerning pragmatics, Krifka defines the notion of distinctiveness expressing that, in a sequence of sentences with contrastive topics, the comments predicated on the topics must be distinct, which follows

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[9] A note on terminology:
— According to Krifka's two-dimensional model of information structure, a (categorical) sentence consists of a topic part and a comment part.. A focus may occur in both the comment and the topic part of the sentence and triggers a set of alternatives (cf. Rooth 1992). Foci in the comment are marked by 'F' – foci in the topic indicate *contrastive topics* (cf. Büring 2003) and are marked by 'CT'. Accents are indicated only if required, slashes representing topic accents and backslashes representing accents in the comment.
— The accented position (or 'focus domain') indicates the range within which alternatives vary, while the focus (or 'focus phrase', cf. Krifka 2006) includes the range within which background information is taken into account:
   (i) Ben only invited [the girl from [DENMARK]$_{focus\ domain}$]$_{Focus}$ (... not the girl from Bulgaria)
   (ii) Ben only invited [[the girl from DENMARK]$_{focus\ domain}$]$_{Focus}$ (...not the man with the fancy hat)

from the Gricean maxim of manner ('be brief'). The distinctiveness constraint explains why (17a) is bad, and (17b) is preferred (= 48 in Krifka 1999) The fact that (17c) is fine although violating the distinctiveness constraint is considered as evidence that stressed additive particles in sentences with contrastive topics allow "to get around the distinctiveness constraint" (p. 12).

(17) What did Peter and Pia eat?

    a. */PETER$_{CT}$ ate \PASTA$_F$ and /PIA$_{CT}$ ate \PASTA$_F$.

    b. Peter and Pia ate \PASTA.

    c. /PETER$_{CT}$ ate \PASTA$_F$ and /PIA$_{CT}$ ate pasta, \TOO$_F$.

Krifka's analysis of stressed additive particles has been refined in Saebo (2004) by allowing for cases where the antecedent sentence, S1, does not include a contrastive topic marked by a rising accent, and the contrastive topic in the sentence hosting the additive particle, S2, a posteriori turns the S1-topic into a contrastive one. This implies that the speaker may use a stressed additive particle even if the S1-topic has not been marked as being contrastive, thereby indicating that she considers the S2-topic plus the S1-topic as the superordinate topic. Eckardt (in this volume) argues, however, that both Krifka's account and Saebo's refinement fail to explain experimental results showing that the use of additive particles is not per se obligatory – obligatoriness depends on the text type. She suggests that the ultimate reason for the use of additive particles is the need to mark shared properties, for example that Peter and Pia share the pasta-eating property in (17c). She suggests that additive particles resemble determiners in noun phrases in marking identity (or non-identity – *the, a, another, …*). As a consequence, additive particles are subject to the 'Maximize presupposition!' principle, as are determiners.

Krifka's analysis of stressed additive particles has also been criticized by Féry (2010). She argues that stressed *AUCH* is not necessarily associated with contrastive topics and offers an account such that *auch* can take two information structural roles, association-with-focus and free focus – unstressed *auch* is associated with focus, stressed *AUCH* carries a free focus. The two roles of *auch* correspond to the two interpretations of *auch* distinguished in Reis & Rosengren (1997) – *in addition/furthermore* and *likewise* – which, following Reis & Rosengren, depend on whether or not the syntactic scope of *auch* contains stressed material or not. In its association-with-focus role the interpretation of *auch* is the standard one, that is, presupposing that the background of the sentence applies to another alternative of the associate. In the free-focus role, however, *AUCH* is just an element carrying a verum focus and, like other cases of verum focus, requires that the rest of the sentence consists of given material. The two roles are demonstrated in (18 a,b) (= 5, 6 in Féry 2010).

(18)   a. [/MARIA]$_{CT}$ hat auch$_1$ [/KUCHEN]$_{F1}$ gegessen.   association-with-focus
        'Maria also ate cake.'

    b. [/MARIA]$_{CT}$ hat [\AUCH]$_F$ Kuchen gegessen.   free focus
        'Maria ate cake, too.'

Féry's claim includes two points: First, accented *AUCH* is not associated with a contrastive topic, and secondly, the accent on *AUCH* indicates a verum focus. Both claims can be disputed: If there is no association with the contrastive topic, where do we get the alternatives from that are mandatory for the interpretation? How do we know that (18b) presupposes that someone else ate cake, in addition to Mary? To back up her claim, Féry presents the examples in (19) and (20). In (19) (= 38 in Féry 2010) the contrastive topic differs from the additional item. However, this discrepancy need not lead to the conclusion that *AUCH* is not associated with the contrastive topic. (19) can instead be explained by the interference of two answer strategies (in the sense of Büring 2003), *"who (out of Mary, Peter, …) ate what?"* and *"what (out of rice and beans) did Peter eat?"*. In competing for the topic position the pronoun lost, but from a discourse pragmatic

perspective it is still equivalent to a contrastive topic.[10]

(19)   (Mary ate rice and beans. Did Peter eat the same?)
         [/BOHNEN]$_{CT}$ hat er [\AUCH]$_F$ gegessen.
         'He also ate beans.'

The example in (20), quoted from Reis & Rosengren (1997, p.249), is also presented by Féry to back up the claim that stressed *AUCH* does not need a contrastive topic. There is apparently no contrastive topic in (20) – a question word cannot be topical because it is not even referential. Surprisingly, however, neither Féry nor Reis & Rosengren notice that (20) is marked. It is the same type of 'show master' question as (7b) in the introduction, presupposing that the speaker already knows the answer. Thus instead of accepting (20) as an argument against association with contrastive topic, we will argue in section 5 that the need for a contrastive topic turns the question word into a (speaker-)referential phrase, similar to a specific indefinite, thereby causing the show master effect.

(20)   Ich stand vor dem Eingang, und wer stand da plötzlich [/AUCH]$_F$?
         'I stood in front of the entrance, and who suddenly appeared?'

The second half of Féry's claim relates to the interpretation of the accent on *AUCH*. She follows Krifka in calling it a verum focus. But while regular verum foci are licensed by a polarity question-under-discussion, polarity questions are not sufficient to license an assertion with stressed *AUCH*. (18b) can, of course, be the answer to *Hat Maria Kuchen gegessen?* 'Did Mary eat cake?'. In this case, however, (18b) is over-answering because it not only confirms the polarity question-under-discussion but in addition expresses that someone else ate cake, too.

In section 4 a solution for stressed *NOCH* and *AUCH* will be discussed starting from Féry's insight that in the case of a stressed particle the rest of the sentence consists of given material and the particle is the only element that can coherently carry the sentence accent. Different from Féry's account the accent will be considered as the result of deaccenting requirements, without conveying a meaning of its own.

3 Lists vs. plain sets of alternatives

In the introduction, three characteristics distinguishing additive *noch* from *auch* were presented – alignment with discourse time, association with deaccented focus, and continuation of the question-under-discussion. This section is about the first one, alignment with discourse time. It is generally accepted that additive *noch* is scalar, presupposing an order on the set of alternatives it operates on (cf. König 1991). It is, moreover, obvious that the order corresponds to the order of mentioning in discourse. We will nevertheless have a closer look at the way the order of mentioning is aligned with discourse time and in the end of this section provide a semantic interpretation of additive *noch* based on ordered alternatives.

3.1 Alignment with discourse time

Alignment with discourse time is possible for additive *noch* but impossible for *auch*. This is evident from examples like (5), repeated in (21). The temporal adverb *dann* can relate both to the temporal sequence of events – real time – and to the sequence of utterances – discourse time. In (21a,b) it is combined with *noch* and with *auch*, respectively. In the given context real time interpretation and discourse time interpretation are equally plausible. In combination with *noch*, in (21a), both interpretations of *dann* are in fact available, either Otto drank the schnaps after he drank the beer, or the utterance of (21a) occurred after an utterance about him drinking beer. In contrast, in combination with *auch* the discourse time reading is strongly dispreferred – (21b) can only mean that the schnaps drinking occurred after the beer drinking.

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[10] Similar interference effects with contrastive topics are discussed in Umbach (2005).

(21)   (Otto hat ein Bier getrunken. 'Otto had a beer.')
        a. Dann hat er noch einen Schnaps getrunken.
        b. Dann hat er auch einen Schnaps getrunken.
           'Then he drank a schnaps in addition.'

Compatibility with the discourse time interpretation of *dann* is evidence that the order coming with additive *noch* is in fact the order of mentioning. This is why *noch* in contrast to *auch* gives the impression of an enumeration. Note that enumeration must be aligned with discourse time – you can't enumerate by *secondly, … fifth, … first, ….* But it can run counter real time. This is shown in (22) where the order of mentioning is not consistent with the order of real time.

(22)   (Otto wants to pay his bill and asks the barkeeper: What did I drink?)
        Barkeeper: Drei Bier, und eine Selters, und einen Kaffee, und dann noch einen Schnaps, gleich als du
                      gekommen bist.
                      'Three beer, and a selters, and a coffee, and then *noch* a schnaps, when you came in.'

In (23) properties instead of individuals are added. While *auch* is perfect in adding properties, cf. (a), *noch* requires a second expression, e.g. *dazu* 'in addition', in order to prevent a temporal interpretation. This is why (b) is bad but (c) is fine. In (d) the discourse time reading of the adverb *dann* 'then' prevents a temporal interpretation of *noch*. As shown before in (21b), in combination with *auch* only the real time reading of *dann* is licensed, which makes (e) barely interpretable. The same behavior can be observed with verb phrases, as in (24). (The fact that the sentences are perfective is evidence that the problem in (23) is not caused by aspect.)

 (23)   Isabelle ist sehr hübsch.
        'Isabelle is very pretty.'
        a. 'Sie ist auch klug.
        b. # Sie ist noch klug.
        c. Sie ist noch dazu klug.
           'She is *auch / noch / noch dazu* clever.'
        d. Dann ist sie noch klug.
        e. ?? Dann ist sie auch klug.
           'Then she is *noch / auch* clever.'

(24)   Isabel hat Faust gelesen.
        'Isabel read Faust.'
        a. # Sie hat noch Ulysses gelesen.
           'She read *noch* Ulysses.'
        b. Dann hat sie noch Ulysses gelesen.
           'Then she read *noch* Ulysses.'

The fact that discourse time *dann* facilitates the additive reading of *noch* can be explained by taking the findings in Roßdeutscher (2005) into account. She shows for real time *dann* (in the vorfeld) that it indicates that the two events combined by *dann* do not overlap. Let us assume that this finding can be adapted to the level of utterances such that discourse time *dann* indicates that the two answer events combined by *dann* do not overlap. Thus the two answers are disjoint answers addressing the same topic (cf. Zeevat & Jasinskaja 2007). The interaction between *dann* and *noch* is demonstrated in (25). In the (a) version thunderstorm and rain count as one event entailing that thunderstorm includes rain, and in the (b) version there are two separate events entailing that thunderstorm may come without rain. Separation of events in (b) is due to the occurrence of *dann* irrespective of whether it receives a real time or a discourse time interpretation. In the (a) version *noch* has a temporal interpretation, while in (b) it must be interpreted as being additive, separating events as well as answers.

(25) (Es hat gewittert 'There was a thunderstorm')
    a. Es hat noch geregnet, als ich nach Hause kam.
       'It was still raining when I came home.'
    b. Dann hat es noch geregnet. Ich bin klatschnass geworden.
       'It rained in addition. I got wet all over.'

The observation that *noch* requires a host sentence constituting a disjoint answer is confirmed by the different behavior of *auch* and *noch* in the (26b). Zeevat & Jasinskaja (2007) present the English version in (26a) (their 33) as a counterexample to the hypothesis that additivity indicates a disjoint answer to an already addressed topic question. It's a counterexample because *also* is licensed in (26a) although the sentence it is hosted in is not a disjoint answer. Zeevat & Jasinskaja point out, however, that lexical expressions for additivity like *in addition* are not licensed in (26a). The same holds for additive *noch*, cf. the translation in (26b). The observation that *noch* requires a disjoint answer as a host matches with the finding at the end of the paper that *noch* must occur in continuation questions (cf. section 5.2).

(26)   a. I invited the doctor. And in inviting her, I also / # in addition invited the mayor.
       The doctor is the mayor, didn't you know that?
     b. Ich habe den Doktor eingeladen. Und ich habe auch / # noch/ # zusätzlich den Bürgermeister
       eingeladen – der Doktor ist nämlich der Bürgermeister.

3.2 The semantics of additive *noch*

The semantics of additive *noch* is spelt out below in a structured meaning format, as a pair of background and focus <B, F> (cf. von Stechow 1990), taking into account that
— the set of mentioned alternatives is a subset of the overall set of alternatives (cf. Tovena's distinction between actual and potential alternatives, section 2.2);
— the set of alternatives is ordered;
— for mentioned alternatives the order is aligned with the order of mentioning;
— the focus is the maximal element of the mentioned alternatives;

(27)   *noch* (<B, F**>**) iff <B,F>   where Alt(F) is ordered such that the order is aligned with the order
                of mentioning $<_m$ on the subset of mentioned alternatives $Alt_m(F)$,
                and F is maximal in $Alt_m(F)$;

        presupposing that $\exists x \in Alt_m(F)$ such that $x \neq F$, $x <_m F$, and <B,x>

Apart from the order, the semantics of *noch* is the same as the semantics of *auch/also*. In particular, it is a semantics operating on the level of discourse structure instead of denotation, making use of focus alternatives and the notion of mentioning.

4 Stressed additive *NOCH* vs. stressed *AUCH*

The second of the three characteristics distinguishing additive *noch* from *auch* pointed out in the introduction, *association with deaccented focus*, concerns the stressed variants. It will be argued in this section that association with deaccented focus provides a simple solution for the interpretation of stressed *noch*. For stressed *auch* there is a partially analogous solution which will, for reasons of coherence, be sketched without going into details in section 4.3.[11]

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[11] The focus model and notational conventions described in footnote 9 will be used this section, too.

4.1 The *auch/noch* accent paradigm

Additive *noch* as well as *auch* are focus particles – they are associated with the focused constituent in the sentence they occur in, and the meaning of the sentence differs with different foci. In terms of Beaver & Clark (2008) they are conventionally associated with focus, since there is a "grammatical dependency on the current question-under-discussion" (p.40).[12] As a side note: the other readings of *noch* – temporal / marginality / comparative – are not (conventionally) associated with focus.

In (28) - (30) the prominent accent positions in sentences with additive *noch* and *auch* are listed. In (28a), the focus being on the object, there has to be some other beverage Otto drank, for example a beer. In (b), the focus including the verb phrase, there has to be some other intake of food, for example eating a hamburger. In (c), with focus on the subject, there has to be some other person who drank schnaps, for example Bruno. Thus, the unstressed variants of *noch* and *auch* are uniformly associated with the focus.

(28) a. Otto hat noch / auch [einen SCHNAPS]$_F$ getrunken.   (a beer + a schnaps)
      b. Otto hat noch / auch [einen SCHNAPS getrunken]$_F$.   (eat a hamburger + drink a schnaps)
      c. OTTO$_F$ hat noch / auch einen Schnaps getrunken.   (Bruno + Otto)
          'Otto drank *noch / auch* a schnaps.'

The stressed variants of NOCH and AUCH differ from each other. In (29a), with stressed *NOCH*, it is presupposed that Otto had another schnaps. This will be considered as evidence that the focus in the case of *NOCH* is deaccented and the particle is associated with a deaccented focus (see next section). The example in (29b), with stressed *AUCH* presupposes that there is another person drinking schnaps, which is why stressed *AUCH* is said to be associated with the contrastive topic. (29c) shows that the contrastive topic need not be the subject.

(29) a. Otto hat NOCH [einen Schnaps]$_F$ getrunken.   (schnaps one + schnaps two)
      b. OTTO$_{CT}$ hat AUCH einen Schnaps getrunken.   (Bruno + Otto)
          'Otto drank another schnaps / a schnaps, too.'
      c. [An /BORD]$_{CT}$ hat Otto AUCH einen Schnaps getrunken.   (at the station + on board)
          'On board, 'Otto drank a schnaps, too.'

In (30) the particles are unstressed and occur in the vorvorfeld.[13] This position invariably directs the focus on the vorfeld. *Auch* in this position is associated with the focus, presupposing another person drinking schnaps. *Noch* in this position is not associated with the focus, at least not conventionally associated, and it has a quasi-temporal reading – Otto in (30b) marks a certain point in a temporal sequence – instead of an additive one.

(30) a. Auch OTTO$_F$ hat einen Schnaps getrunken.   (Bruno + Otto)
          '*Auch* Otto had a schnaps.'
      b. Noch OTTO$_F$ hat (jeden Abend) einen Schnaps getrunken.   (quasi-temporal reading)
          'Otto still had (the habit of drinking) a schnaps every evening.'

Surprisingly, there are three Bruno+Otto situations in (28)-(30), related to different accent patterns and positions, (28c), (29b), and (30a). The difference in meaning between these examples can only be seen

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[12] Beaver & Clark (2008) distinguish three types of focus sensitivity: (i) quasi association, which is a pragmatic inference, (ii) free association, performed by operators quantifying over implicit domains, and (iii) conventional association, which is grammatically encoded.
[13]The *vorvorfeld* precedes the *vorfeld* position of a German matrix clause and is available for some connectives and particles – *Aber/Auch/Nur* (vorvorfeld) *Anton* (Vorfeld) *schläft.* 'But/Also/Only Anton is sleeping.'

when considering the respective questions-under-discussion. In (31) the examples are shown in response to their licensing questions. The question-under-discussion in (31a) is a constituent question asking for persons, and the focus on *Otto* responds to the question word. The question-under-discussion in (31b) is a constituent question asking for beverages consumed by the superordinate topic *die Onkels* 'the uncles'. The first sentence of the answer is about one part of this topic, uncle Bruno. The second sentence is about the other part, uncle Otto, and we learn that Otto had a schnaps, as Bruno did. Thus *einen Schnaps* is the constituent responding to the question word. This will be considered as evidence against the verum focus interpretation of *AUCH*, cf. section 4.3. In (31c) the question is a polarity question – straight-forward confirmation yields the vorvorfeldposition of *auch* plus focus on the vorfeld.

(31) a. A: Wer hat NOCH einen Schnaps getrunken?
          'Who drank *noch* a schnaps?'
     B: OTTO$_F$ hat noch / auch einen Schnaps getrunken.   (Bruno + Otto)
          'Otto drank *noch* a schnaps.'

     b. A: Was haben die Onkels getrunken?
          'What did the uncles drink?'
     B: (/BRUNO$_{CT}$ hat [einen SCHNAPS]$_F$ getrunken.)
          /OTTO$_{CT}$ hat AUCH einen Schnaps getrunken.   (Bruno + Otto)
          'Bruno drank a schnaps. Otto drank *auch* a schnaps.'

     c. A: Hat Otto AUCH einen schnaps getrunken?
          'Did Otto *auch* drink a schnaps?'
     B: Auch OTTO$_F$ hat einen Schnaps getrunken.   (Bruno + Otto)
          '*Auch* Otto drank a schnaps.'

Although (31) (a) - (c) require the same type of situation – Bruno+Otto – they are not identical in their function in discourse management. The difference between (a) and (c) stems from the grammatical form of the question and will be discussed in section 5. The difference between (a), (c) on the one hand and (b) on the other stems from the fact that in (b) Otto is a contrastive topic, that is, presented as part of the topic, while in (a) and (c) Otto is the focus. Finally, a caveat: It is not the case that stressed *NOCH* is automatically additive. In (32), for example, *NOCH* is clearly temporal (and is translated into English as *still*). The reason for the accent on *NOCH* is obvious: the rest of the clause must be deaccented because it contains only given material.

(32) Es hat den ganzen Tag geregnet und es regnet NOCH.
      'It rained all day and it is still raining.'

4.2 Association with deaccented focus: *NOCH*

Following the standard accounts stressed *AUCH* is associated with contrastive topic. This solution cannot be adopted for *NOCH* because it would give the wrong result – the additional element in (29a), repeated in (34), is not another person, but another schnaps. The solution opted for in this paper starts from Féry (2010). We will assume that the accent on *noch* is due to deaccenting requirements imposed on the rest of the sentence. However, different from Féry, we will not interpret the accent as indicating a verum focus, and in fact not interpret it at all – it's just an emergency landing place for the obligatory sentence accent. It will be argued that stressed *NOCH* is associated with a focus that is deaccented because it contains only given material. For example, in (34) the focus is on the deaccented NP *einen Schnaps*. This solution is simpler than Féry's account, as there is no additional verum focus, and it yields the correct result, i.e. the various schnaps alternatives in (34). This solution is, moreover, supported by the fact that there are other phenomena to be explained by deaccenting, e.g., second occurrence foci and examples like (32).

There is one problem coming with the deaccented-focus solution, which is the problem of how to distinguish the alternatives triggered by a deaccented focus. If there is an accented position within the focus, it marks the position with respect to which the alternatives vary, cf. (33).[14] But in (34) there is no accent indicating a point of variation. Therefore, all the alternatives are schnapses, which is empirically correct. But identical items cannot constitute a set. We need a method to individuate alternatives. Since alternatives are no referential entities – being given or new is not a matter of reference (cf. Rochemont 1986, Schwarzschild 1999) – we cannot individuate the schnaps-alternatives by variable names. But there is a simple way out: Additive *noch* is scalar inducing an order on the alternatives, and the order individuates alternatives by their position even if they are descriptively identical. Thus in the case of deaccented foci, the alternatives are indexed by their position, cf. (34). This is the *association with deaccented focus* account proposed for *NOCH*, cf. (35).

(33) a. Otto hat [einen SCHNAPS]$_F$ getrunken.   Alt(ein schnaps) = {a schnaps, a beer, a coke, ...}
     'Otto drank a schnaps.'

    b. Otto hat [einen GRIECHISCHEN Schnaps]$_F$ getrunken.
     'Otto drank a Greek schnaps.'   Alt(ein schnaps) = {a Greek schnaps, a French schnaps, a Hungarian schnaps, ...}

(34) Otto hat NOCH [einen Schnaps]$_F$ getrunken.   Alt (ein schnaps) = {schnaps$_1$, schnaps$_2$, ...}
    'Otto drank another schnaps.'

(35) Association with deaccented focus for *NOCH*
    Stressed *NOCH* is associated with a deaccented focus F such that Alt(F) = {i $\in$ N | F$_i$ }

Below two more examples with stressed *NOCH* are presented in support of the *association with deaccented focus* hypothesis. In (36a), deaccentuation is required to prevent the entailment that the painter is no artist. In (36b), without an additive particle, being a painter and being an artist would be interpreted as distinct properties, due to the fact that conjuncts in a coordination are interpreted as being semantically distinct (Lang 1984). In (36c), with stressed *AUCH* instead of *NOCH*, the entailment that the painter is no artist is not blocked, since stressed *AUCH* can be associated with the first conjunct (this reading is improved by omission of the article). Assuming that *noch* imposes an order on alternative sets, and that conjuncts in a coordination are subject to the same constraints as alternatives (cf. Umbach 2004), the effect of *NOCH* in (36a) consists in indicating that the artist denoted by the second conjunct is the second-mentioned artist, thereby implying that the painter is an artist, too.

(36) a. Auf der Party war ein Maler und NOCH ein Künstler.
    b. Auf der Party war ein Maler und ein Künstler.
     'There was a painter at the party and *NOCH* / $\varnothing$ an artist.'

    c. (Auf dem Empfang war ein Wissenschaftler und ein Künstler.)
     Auf der Party war ein Maler und AUCH (ein) Künstler.
     'At the reception there was a scientist and an artist.
     At the party there was a painter and *AUCH* an artist.'

In (37) the *noch*-version is felicitous because the order makes it possible to individuate politicians – for each politician there is a second one whom he knows. The *auch*-version is infelicitous because there is no contrastive topic and thus no way to distinguish the first and the second politician (the agent and the object).

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(37) a. *Jeder korrupte Politiker kennt AUCH einen korrupten Politiker.
     b. Jeder korrupte Politiker kennt NOCH einen korrupten Politiker.
        'Every corrupt politiker knows *auch / noch* a corrupt politician.´

4.3 Association with split focus: *AUCH*[15]

The standard solution for stressed *AUCH*, association with contrastive topic, has two major disadvantages. First, one has to postulate different associates for the unstressed and the stressed occurrence of *auch* (focus and contrastive topic, respectively). Secondly, an additional explanation is required for the accent on the particle, e.g. that it is a verum focus, which is unlikely taking into account that sentences hosting *AUCH* respond to constituent questions instead of polarity questions, cf. (31b) above. The deaccented-focus solution for *NOCH* can do without either of these disadvantages, thereby raising the question of whether it can be adopted for stressed *AUCH*. The split-focus solution suggested below is similar to one proposed for *NOCH* in considering *AUCH* as being associated with focus and the accent as being an emergency solution without semantic impact.

Stressed *AUCH* appears to be associated with the contrastive topic because the additional elements are – apparently – alternatives of the contrastive topic. In (39a) Otto appears to be added to other schnaps-drinking persons, e.g. Bruno. However, it can also be argued that the additional item is a schnaps consumed by Otto, and that this is the focus of the sentence, thereby accounting for the fact that (39a) is the answer to a constituent question asking for drinks instead of persons (cf. 31b above). This led to the idea that *AUCH* is associated with a deaccented focus, similar to *NOCH*, while the contrastive topic alternatives serve as individuating indices for descriptionally identical alternatives. For example, assume that the focus is on the deaccented NP *einen Schnaps*, as shown in (39a), and the contrastive topic alternatives are {Otto, Bruno, Egon, …}. Being descriptionally identical the focus alternatives will be individuated by the topic alternatives, yielding focus alternatives indexed by contrastive topic alternatives, as shown in (39b). The idea of *indexing by contrastive topic* is given in (38). It would allow to interpret stressed *AUCH* analogous to unstressed *auch* and analogous to stressed *NOCH*. Unfortunately, it has a major flaw.

(38) *Indexing by contrastive topic* for *AUCH*   (to be rejected)
     Stressed *AUCH* is associated with a deaccented focus F such that $Alt(F) = \{x \in Alt(CT) \mid F_X \}$

(39) a. $OTTO_{CT}$ hat AUCH [einen Schnaps]$_F$ getrunken.
        'Otto drank *auch* a schnaps.'

     b. Alt (ein schnaps) = {schnaps$_{BRUNO}$, schnaps$_{OTTO}$, schnaps$_{EGON}$, …}   (to be rejected)

The flaw of the solution above lies in cases in which there is not even a deaccented focus to be associated with *AUCH* because the particle occurs at the end of the sentence, as in (40a,b). One might come up with a story such that if the focus is empty the contrastive topic alternatives constitute the focus alternatives. But this effort blurs the fact that alternatives stressed *AUCH* operates on correspond to a focus (or focus phrase) include the material in the contrastive topic. This is evident when considering the basic word order corresponding to (39a) and (40a,b), cf. (41).[16]

(40) a. [Einen SCHNAPS]$_{CT}$ trank Otto AUCH.
        'Otto drank *auch* a schnaps.'

     b. $OTTO_{CT}$ schlief AUCH.
        'Otto slept *auch*.'

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[15]In the first version of this paper I proposed the *indexing-by-CT* solution in (38). An anonymous reviewer convinced me that it does not cover the required range of data. He/she suggested that *AUCH* gets stress by stranding, not by deaccenting of the associated focus. I'm very grateful for this suggestion – the solution below follows this line.
[16] German basic word order is verb-final.

(41)   a. weil auch [OTTO einen Schnaps getrunken hat.]$_F$[17]
           'because *auch* Otto drank a schnaps.'

       b. weil Otto auch [einen SCHNAPS trank.]$_F$
           'because Otto *auch* drank a schnaps.'

       c. weil auch [OTTO schlief.]$_F$
           'because *auch* Otto slept.'

The basic word order reveals that the contrastive topic supposedly associated with *AUCH* represents the accented part of the focus associated with *auch*. This suggest that *AUCH* in (39a) and (40) is in fact associated with focus. The focus, however, is not completely deaccented but instead includes the contrastive topic material which has been moved for independent reasons. Since the topicalization movement leaves behind only deaccented material *auch* has to carry the obligatory sentence accent. Thus, the focus associated with accented *AUCH* is split into a topicalized part carrying the accent and a deaccented part adjacent to the particle, and if the deaccented part is empty the particle resembles a stranded preposition. This is called *association with split focus* in this paper and is demonstrated in (42).

(42)   *Association with split focus* for *AUCH*

       a. [OTTO$_i$]$_{CT}$ hat AUCH [t$_i$ einen Schnaps getrunken]$_F$.
           'Otto drank *auch* a schnaps.'

           Alt([OTTO hat einen Schnaps getrunken]) = {Otto hat einen Schnaps getrunken, Bruno hat einen
                                                         Schnaps getrunken, ...}

       b. [[Einen SCHNAPS]$_i$]$_{CT}$ trank Otto AUCH [t$_i$]$_F$.[18]
           'Otto drank *auch* a schnaps.'

           Alt([einen SCHNAPS trinken]) = {einen Schnaps trinken, eine Cola trinken, ...}

       c. [OTTO$_i$]$_{CT}$ schlief AUCH [t$_i$]$_F$.
           'Otto slept *auch*.'

           Alt([OTTO schlief]) = {Otto schlief, Bruno schlief, ...}

Association with split focus provides a uniform analysis for unstressed and stressed *auch* – the particle is associated with the focus – and it dismisses the assumption of a verum focus without further ado. There is one point to be considered which is the double role of the contrastive topic. The material in the contrastive topic is part of the focus associated with *auch* and, in carrying the accent, indicates the range within which alternatives vary (cf. footnote in section 4.2). At the same time it has to fulfill its role in discourse management indicating an answer strategy (cf. Büring 2003). The double role of the contrastive topic would be problematic in a one-dimensional model of information structure where topic is identified with background and thus cannot be part of the focus. But there is no conflict in a model distinguishing the topic/comment dimension from the focus/background dimension: Focus triggers the alternatives for *auch* to operate on while topicalization affects the processing strategy in a discourse. In split focus cases like (42a-c) the contrastive topic material simultaneously marks the position where the antecedent alternative will differ from the sentence hosting *AUCH* (Otto vs. Bruno vs. … slept) and it indicates that the speaker chose

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[17] It is important to note that for additive *noch* this word order is impossible. '*weil noch Otto einen Schnaps getrunken hat*.' licenses only a quasi-temporal reading (cmp. 30b in section 4.1)
[18] Verb movement will be neglected here.

to present the state of affairs by processing the list of persons involved – she could have chosen, e.g., points in time instead of persons.

Association with split focus is in some sense close to the proposal of Reis & Rosengren (1997). Reis & Rosengren consider the accent on *AUCH* as indicating a narrow focus, but the set of alternatives the *auch* sentence belongs to is not supplied by the focus structure of the sentence but by comparing it to its antecedent. Comparison to the antecedent is implicit in the present account, yielding the deaccenting requirements. Different from the present account, Reis & Rosengren reject movement and suggest that *auch* is sensitive to scope instead of focus – if unstressed, the scope of *auch* includes the associated constituent, and if stressed it contains only background material – which finally leads to the distinction of two utterance meanings – *in addition* and *likewise*. In the *split focus* account presented here there is no reason to distinguish two utterance meanings. However, the semantic difference between (the English expressions) *in addition* and *likewise* is interesting from the perspective of strategies of additivity across languages (cf. section 6).

Finally, *association with split focus* allows for a straightforward analysis of the combination of the additive particles *auch* and *noch*, which is highly frequent in spoken language. When occurring in combination *auch* must precede additive *noch*. As for stress patterns, at least the three variants in (43) are licensed and differ in meaning. The interpretation makes use of nested foci yielding the intended sets of alternatives. Note that the variant in (43c) does not appear redundant although the focused material is identical for both foci. This can be explained by taking *auch* as marking a supplement to the previous answer while *noch* indicates an extension of the domain of the question-under-discussion (cf. section 5.2).

(43) a. /OTTO hat \AUCH noch einen Schnaps getrunken.
'Otto drank another schnaps (in addition to someone else who had another schnaps).'

[OTTO $_i$]$_{CT}$ hat AUCH$_1$ [t$_i$ noch$_2$ [einen Schnaps]$_{F2}$ getrunken.]$_{F1}$

b. Otto hat auch \NOCH einen Schnaps getrunken.
'Otto drank another schnaps (in addition to something else he did).'

Otto hat auch$_1$ [NOCH$_2$ [einen Schnaps]$_{F2}$ getrunken.]$_{F1}$

c. Otto hat auch noch einen \SCHNAPS getrunken.
'Otto drank a schnaps (in addition to eating a hamburger, in addition to something else he did).'

Otto hat auch$_1$ [noch$_2$ [einen SCHNAPS getrunken.]$_{F2}$]$_{F1}$

5 Discourse management

The third of the three types of contrasts between additive *noch* and *auch* is manifest in their distribution in questions, which we will use as a window to investigate the roles of additive *noch* and *auch* in discourse management.[19]

5.1 Additive *noch* vs. *auch* in questions

Additive *noch* and *auch* differ considerably in their behavior in questions. The example in (7), repeated in (44), shows that *noch* can be used to ask for a continuation of the discourse. (44a) is felicitous in a scenario

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[19] The term *discourse management* was inspired by Krifka's *common ground management* (Krifka 2007) and is meant to summarize the effects of focus particles in the interaction of questions and answers in a question-based discourse model.

where Sue has addressed the question "what happened during the summer?" with respect to all topics she considers relevant, e.g. travel, boyfriend, job, and has signaled that what she considers to be the current question under discussion is completely answered. Her mother, however, wants to hear more and thus requires Sue to answer the same question with respect to additional topics. If *noch* is replaced by *auch*, as in (44b), the question is marked and can only be understood as a 'show master' question: Auntie reminds Lisa that there is something missing in the previous answer and asks her to provide a supplement. Show master questions are rhetorical in the sense that the speaker is not sincere in asking because she already knows the answer. Still, they are not part of a monologue, like other rhetorical questions, but part of a dialog, and are directed at an addressee who is supposed to give an answer. Show master questions are ruled out in scenarios that requires sincere questions. This is the reason why in (45) replacing *noch* by *auch* is completely out.

(44) a. (Sue informs her mother about what happened during the summer)
Mother to Sue: Und was ist im Sommer noch passiert?
'What happened *noch* in the summer?'

b. (Little Lisa tells her mother what happened when she visited the zoo with Auntie.)
Auntie to Lisa: Und was ist im Zoo auch passiert?
'What happened *auch* in the zoo?'

(45) (In the butcher's shop:)
Was möchten Sie noch / *auch?
'What do you want *noch / auch*?'

The examples in (46) vary between *noch* and *auch* and, in addition, between constituent and polarity questions. In the beginning Ben told Ann that he met Otto at the party. In the polarity question in (a), Ann responds by asking whether a specific person different from Otto was at the party. This is felicitous with *auch*. When using *noch* the reading switches – *noch* in (b) can only be interpreted temporally. In the constituent question in (c), Ann responds by asking for other guests she might not know of, which is felicitous with *noch* but impossible with *auch* (apart from a show master interpretation), cf. (d).

(46) Ben: Gestern auf der Party habe ich Otto getroffen.
'Yesterday at the party I met Otto.'

Ann: a. War Paul auch da?
Was Paul *auch* there? '

b. # War Paul noch da?   temporal reading only
'Was Paul *noch* there*?*

c. Wer war noch da?
'Who was *noch* there?'

d. # Wer war auch da?   show master question
'Who was *auch* there?'

Considering the finding in (46) one might think that polarity questions exclude the additive reading of *noch* while constituent questions exclude the use of *auch* (apart from show master questions). But this generalization is not correct. Consider the polarity questions with *noch* in (47). The stressed variants in (a) and (b) are unproblematic, and the unstressed variant in (c) is still acceptable. Only (d) is definitely unacceptable. This is evidence that the decisive factor for the acceptability of *noch* in questions it is not the type of the question but the nature of the associated constituent. With non-specific indefinites, as in (47)(a)-(c), polarity questions with *noch* are acceptable, but with referential expressions, like the specific indefinite in (47d) or the proper name in (46b), they are not. So the correct generalization is: additive *noch* can be used in a polarity question, but the added item must not be known to the speaker. From this

perspective, polarity questions with additive *noch* are close to constituent questions: The speaker does not ask the addressee to confirm a solution – answering (47a) and (b) by *yes* would not be cooperative – and instead asks the addressee to provide additional solutions, that is, referents for the non-specific indefinite.

(47)   (Ann and Ben talk about the party. Ann asking Ben:)
    a.   War NOCH jemand/einer da?   (in addition to the guests Ben already mentioned)
       'Was *noch* some one there?'

    b.   War NOCH ein Fotograf da?   (in addition to Bruno, who is a photographer)
       'Was *noch* some a photographer there?'

    c.   War noch ein FOTOGRAF da?   (in addition to the numerous painters)
       'Was *noch* a photographer there?'

    d. # War ein bestimmter Fotograf noch da?   (namely the guy from Munich)
       'Was a certain photographer *noch* there?'   (temporal interpretation only)

The second half of the attempted generalization was directed at constituent questions with *auch.* (48a) demonstrates that unstressed *auch* is grammatical in constituent questions. However, in (48a) *auch* is irrelevant for the structure of the answer. The speaker simply asks for people with a certain property, here, people who visited the Pergamon museum in addition to some other touristic point of interest. In order to find out who in addition to some other person visited the Pergamon museum one might try the stressed version in (48b). But (48b) is a show master question, the speaker knowing the answer in advance.

The reason for the show master effect is now easy to see: Stress on *AUCH* requires that there is a contrastive topic (even if its material belongs to a split focus), and contrastive topics are topics, that is, referential and familiar to the speaker. The wh-word is, as a rule, unsuited to serve as a contrastive topic because it is not referential. However, in show master questions the need for a contrastive topic imposes a referential interpretation on the wh-word, which is why these questions presuppose that the speaker is familiar with the answer. Show master questions are perfectly acceptable when the speaker wants the addressee to publically pronounce the answer, be it to please Mama, as in the example in (7b)/(44b), or to win a million. It might appear unusual at first sight to assume a referential interpretation of a wh-word. Note, however, that specific interpretations of non-specific expressions are well-known from indefinite noun phrases.

(48)   a.   Wer hat auch das Pergamon Museum besucht?   (in addition to the National Galerie)

    b.   ?? Wer hat AUCH das Pergamon Museum besucht?   (in addition to Otto) (show master question)
       'Who *auch* visited the Pergamon museum?'

5.2 The role of additive *noch* vs. *auch* in discourse management

The technical notions required in this section are standard:
— **Questions** will be represented in the structured format suggested in Krifka (2001), as a pair of background and domain, <B, D>. For constituent questions the domain is a subset of the appropriate type and is restricted by the context in various ways. The domain of polarity questions consists of identity and negation, corresponding to affirmation and denial, cf. (49a, b).

(49) a.   What did Mary read? $<\lambda x.\text{read}(x)(\text{mary}), \text{BOOKS-BY-JAMESJOYCE}>$
    b.   Did Mary read 'Ulysses'? $<\lambda P.P(\text{read}(\text{ulysses})(\text{mary})), \{\lambda p.p, \lambda p.\neg p \}>$

As noted in the previous section, if a polarity question is about a non-specific indefinite, the expected answer, if positive, is not *yes* but instead an instance of the indefinite NP satisfying the proposition, cf. (47c). In order to streamline the discussion we will refer to the set of potentially satisfying instances of a polarity question as the domain of the question, although technically the domain is the set of confirmation and denial.

— **Assertions** will be represented as pairs of background and focus, <B, F>. In a congruent answer the focus of the answer is an element of the domain of the question, $F \in D$. In an ideal question-answer pair the domain of the question corresponds to the set of alternatives triggered by the focus in the answer, $Alt(F) = D$. If the set of alternatives is ordered, the domain of the question is ordered in the same way.

— A **question-based discourse model** is a tree such that the nodes constitute a hierarchy of questions and subquestions, explicit or implicit, where congruent answers occur as leaves. There is a distinct node representing the **question-under-discussion**. The domain of the question-under-discussion will be referred to as **domain-under-discussion**.

The intuitive difference concerning their roles in discourse management has been described in the introduction such that *noch* indicates a continuation while *auch* indicates a supplement. Both are additive in the sense that they presuppose a previously mentioned alternative, and both operate on the level of discourse structure. Still, the way to realize additivity seems to be different for additive *noch* and *auch*. In order to find out the reason for the intuition of continuation as opposed to supplement, let us consider the domain-under-discussion of *noch*-questions in contrast to *auch*-questions.

The dialog in (50) is supposed to precede Ann's questions in (51) and (52), which demonstrate the range of *noch*-questions and *auch*-questions and their effect on the domain-under-discussion.[20]

(50)	ann_1:	Wer war gestern auf der Party?	$ann_1 = <B^{ann1}, D^{ann1}>$
		'Who was at the party yesterday?'	
	ben_1:	Otto und Bruno (waren da).	$ben_1 = <B^{ben1}, F>$, $Alt(F)^{ben1}$
		'Otto and Bruno were there.'	

The follow-up questions in (51) and (52) will be assessed with respect to the question whether the domain is extended or kept constant (*extension / non-extension*). In these assessments it is important to be clear about the base with respect to which extension is measured. There are two options: (i) the alternative set of Ben's preceding answer, $Alt(F)^{ben1}$, and the domain of Ann's previous question, D^{ann1}. In an ideal dialog they are identical, but they may diverge in a less ideal dialog, for example if Ben has a narrower idea of the relevant group of persons than Ann, $Alt(F)^{ben1} \subset D^{ann1}$. The assessments below will be made with respect to the alternatives of Ben's preceding answer, $Alt(F)^{ben1}$. The notion of a superordinate domain D^S will be used as an auxiliary term to guarantee combinability of two domains. D^S can be conceived of as a superordinate topic which is, however, not explicit in the dialog.

The first follow-up question in (51), $ann_{2.noch}.1$, is a clear case of extension of the domain. Ann wants to hear about other people apart from the group explored in Ben's answer, maybe a specific subset or maybe other people in general. The second follow-up question, $ann_{2.noch}.2$, is also a case of extension because the solution Ann asks for cannot be an element of the previous domain, due to the accent on *Maler*. (Recall that the set of painters are called the domain of the question although $ann_{2.noch}.2$ is a polarity question.) The third follow-up question, $ann_{2.noch}.3$, is unclear. It may be argued that the set of painters must have been considered before, since there is no accent on *Maler*. On the other hand, if we consider Ben's answer to be complete, the painters Ben took into consideration must have been a subset of the painters Ann has in mind entailing that $ann_{2.noch}.3$ is a case of extension.

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[20] *Auch*-questions like (48a) are excluded because the particle has no structural influence on the answer, and show master questions are excluded because they are no genuine questions.

(51) follow-up *noch*-questions

    $\text{ann}_{2.noch}.1$ Wer war NOCH da? $D^{ann2} \subset \text{PERSON} - \text{Alt}(F)^{ben1}$

                   'Who was *NOCH* there?' $D^{S} = \text{Alt}(F)^{ben1} + D^{ann2}$ (extension[21])

    $\text{ann}_{2.noch}.2$ War noch ein MALER da? $D^{ann2} = \text{PAINTER}$

                   'Was *noch* a painter there?' $\text{Alt}(F)^{ben1} \cap \text{PAINTER} = \varnothing$

                                                       $D^{S} = \text{Alt}(F)^{ben1} + D^{ann2}$ (extension)

    $\text{ann}_{2.noch}.3$ War NOCH ein Maler da? $D^{ann2} = \text{PAINTER} - \text{Alt}(F)^{ben1}$

                   'Was another a painter there?' $\text{Alt}(F)^{ben1} \subset \text{PAINTER},$

                                                       $D^{S} = \text{Alt}^{ben1} + D^{ann2}$ (extension)

The first follow-up question with *auch*, $\text{ann}_{2.auch}.1$ in (52), cannot be a case of extension because the painter the question is about is marked as a contrastive topic and topical elements are necessarily part of the previous domain-under-discussion. The question indicates that Ann considers Ben's answer to be partial, and it gives the impression of a reminder: *Did you forget about the painter?* The second follow-up question in (52), $\text{ann}_{2.auch}.2$, is analogous to the second follow-up question in (51) denoting an extension of the domain – painters have not been considered before.

(52) follow-up *auch* questions

    $\text{ann}_{2.auch}.1$ War der /MALER AUCH da? $m \in \text{topic}$ (non-extension)

                   'Was the painter *auch* there?' $\text{topic} \subseteq D^{ann2}\ \text{topic} \subseteq \text{Alt}(F)^{ben1}$

    $\text{ann}_{2.auch}.2$ War auch ein MALER da? $D^{ann2} = \text{PAINTER}$ (extension)

                   'Was also a painter there?' $\text{Alt}(F)^{ben1} \cap \text{PAINTER} = \varnothing$

                                                       $D^{S} = \text{Alt}(F)^{ben1} \cup D^{ann2}$

The follow-up questions in (51)/(52) show that there is no one-to-one correlation between domain extension and the use of *noch* vs. *auch*. The former particle always indicates extension, but the latter allows for extension as well as non-extension. The only characteristics clearly distinguishing *noch* vs. *auch* is the way of extension: list concatenation (denoted by +) vs. regular set union.

Let us finally consider possible answers to *noch*- and *auch*-questions. In (53) possible answers to $\text{ann}_{2.noch}.1$ are listed. Interestingly, there is no correspondence between the occurrence of *noch* and *auch* in question and answer – a *noch*-question can easily be answered by an *auch*-sentence, even with stressed *AUCH*. Unstressed *auch* marks an extension of the alternatives considered by Ben. Either he considers his previous answer as partial (i.e. Paul $\in \text{Alt}(F)^{ben1}$) or he admits that he didn't include Paul for some reason. Only with stressed *AUCH* the domain is unchanged, due to the fact that *Paul* is presented as a contrastive topic. In (54) possible answers to $\text{ann}_{2.auch}.1$ are listed, which are the same as before, apart from the fact that the *noch* answer is infelicitous because it would indicate an extension although the painter (i.e. Paul) is presented as part of the topic in the question.

(53) $\text{ann}_{2.noch}.1$ Wer war NOCH da?

                       'Who was *NOCH* there?'

    $\text{ben}_2.1$ PAUL war noch da. $\text{Alt}(F)^{ben2} = \text{Alt}(F)^{ben1} + \{\text{paul}\}$

    $\text{ben}_2.2$ Auch PAUL war da. $\text{Alt}(F)^{ben2} = \text{Alt}(F)^{ben1} \cup \{\text{paul}\}$

    $\text{ben}_2.3$ /PAUL war AUCH da. $\text{paul} \in \text{Alt}(F)^{ben1}, \text{Alt}(F)^{ben2} = \text{Alt}(F)^{ben1}$

                       'Paul was *noch / auch* there.'

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[21] Extension of the domain in the case of *noch* will be performed by list concatenation (+).

(54) $\text{ann}_{2.\textit{auch}}.1$ War der /MALER AUCH da?
           'Was the painter *auch* there?'

    $\text{ben}_2.1$ # Paul war noch da.

    $\text{ben}_2.2$ Auch PAUL war da. $\text{Alt(F)}^{ben2} = \text{Alt(F)}^{ben1} \cup \{\text{paul}\}$

    $\text{ben}_2.3$ /PAUL war AUCH da. $\text{paul} \in \text{Alt(F)}^{ben1}, \text{Alt(F)}^{ben2} = \text{Alt(F)}^{ben1}$

           'Paul was *noch* / *auch* there.'

The findings for additive *noch* and *auch* in question-answer pairs are captured by the notion of *extension question*, *supplementary question,* and *continuation question*, cf. (55), (56) . An extension question is one where the propositional body of the preceding question or assertion is repeated but the domain is extended, as shown in the examples above. In a supplementary question the body of the preceding question is repeated and the domain is included in the domain of the preceding question, cf. (55c). A continuation question is an extension question with ordered domains where the extension preserves the order (e.g. list concatenation), cf. (56). The role of additive *noch* in contrast to *auch* in discourse management is summarized in (57).

(55) a. A question $q^0 = <B^0, D^0>$ is an **extension** question with respect to a preceding **question**
         $q^{-1} = <B^{-1}, D^{-1}>$
         iff   (i) $B^0 = B^{-1}$,   (ii) $D^0 \cap D^{-1} = \varnothing$ (iii) $D^S = D^{-1} \cup D^0$ is a superordinate domain

     b. A question $q^0 = <B^0, D^0>$ is an **extension** question with respect to a preceding **assertion**
         $a^{-1} = <B^{-1}, F > \text{Alt(F)}^{-1}$
         iff   (i) $B^0 = B^{-1}$ (ii) $D^0 \cap \text{Alt(F)}^{-1} = \varnothing$ (iii) $D^S = \text{Alt(F)}^{-1} \cup D^0$ is a superordinate domain

     c. A question $q^0 = <B^0, D^0>$ is a **supplementary** question with respect to a preceding **question**
         $q^{-1} = <B^{-1}, D^{-1}>$
         iff   (i) $B^0 = B^{-1}$ (ii) $D^0 \subset D^{-1}$

     d. A question $q^0 = <B^0, D^0>$ is a **supplementary** question with respect to a preceding **assertion**
         $a^{-1} = <B^{-1}, F >, \text{Alt(F)}^{-1}$
         iff   (i) $B^0 = B^{-1}$ (ii) $D^0 \subset \text{Alt(F)}^{-1}$

     The definitions are adapted to polarity questions $q = <\lambda F.F(P(a)), \{\lambda p.p, \lambda p.\neg p\}>$ by assigning
     $B := P$ and $D := \{a\}$.

(56) A question $q^0 = <B^0, D^0>$ is a **continuation question** iff it is an extension question such that D^0 is ordered. Combination of D^0 and D^{-1} or Alt(F)^{-1} has to be order preserving.

(57) ***noch*** in questions indicates that the question is a continuation question;
     noch in answers addresses a continuation question;

     auch *unstressed*   in questions indicates that the question is an extension question;
          stressed   in questions indicates that the question is a supplementary question;
     auch *unstressed*   in answers addresses an extension question;
          stressed   in answers addresses a supplementary question.

Comparing this analysis to the positions in the literature, Krifka (1999) suggested for stressed additives that they have the pragmatic function "to get around the distinctiveness constraint", cf. section 2.3.

Distinctiveness requires that, in a sequence of sentences with contrastive topics, the comments predicated about the topics must be distinct, which is a consequence of the Gricean maxim of manner ('be brief'). This idea is perfectly in line with the finding that stressed *AUCH* indicates a supplement.

As for *noch*, Eckardt's (2006) analysis was based on the notion of the remnant question. This notion is confusing because it is unclear with respect to which domain the question is remnant. Consider a sequence of questions and answers ann_1, ben_1, ann_2 …. In order to decide whether ann_2 is a remnant question we need to fix the comparison base: If we compare D^{ann2} to $Alt(F)^{ben1}$, then ann_2 is remnant only if ben_1 is a partial answer. But if we compare D^{ann2} to the superordinate domain D^S, then ann_2 is systematically remnant and ben_1 is trivially partial. The second problem with Eckardt's remnant question is that it is insufficient to distinguish between *noch* and *auch*, since it doesn't take the order on the domain into account. Finally, the hypothesis of a fixed search domain is disproved by the present analysis – the domain of a continuation question is not part of the previous domain – provided it is not identified with D^S.

There is a remark in Beaver & Clark (2008) hypothesizing that scalar-additives in general remove a falsely assumed upper bound. Although the scale additive *noch* operates on is independent of the scale of expectations considered by Beaver & Clark, the analysis of additive *noch* supports their claim – by extending the domain-under-discussion *noch* removes a previously assumed upper bound.

6 Conclusion

In the analysis of the semantics and pragmatics of German additive *noch* presented in this paper additive *noch* was compared to the paradigm German additive particle *auch* focusing on three distinctive characteristics – *alignment with discourse time*, *association with deaccented focus*, and *continuation of the question-under-discussion*. Alignment with discourse time was taken as evidence that additive *noch* induces an order on the set of alternatives (and the domain of a question, respectively). While the fact that alternatives are ordered in the case of additive *noch* was to be expected given that temporal *noch* also requires an order, it comes as a surprise that the order accounts for the other characteristics, too.

First, association with deaccented focus for stressed *NOCH* is unproblematic because the order on alternatives provides a way to individuated descriptionally identical alternatives. This is impossible for stressed *AUCH* because alternatives constitute an unordered set. For stressed *AUCH* a *split focus* interpretation was suggested such that the contrastive topic material is included in the focus. This yields an interpretation by association with focus for *auch* as well as *noch*, stressed as well as unstressed. The puzzling show master effect in constituent questions with stressed *AUCH* turned out to be a consequence of the fact that stressed *AUCH* requires a contrastive topic. The other characteristic distinguishing additive *noch* from *auch* relates to the intuition that *noch* indicates a continuation of the question-under-discussion while *auch* indicates a supplement. On a closer look it turned out that *noch*-questions do in fact indicate continuation questions, but that *auch* questions can either be supplementary or extend the domain. The intuitive difference between the continuation brought about by *noch* and the extension brought about by *auch* was traced back to the order on alternatives – continuation by *noch* requires alternatives to be added in an order-preserving way while an extension by *auch* can be realized by plain set union.

One open issue is the question of how the additive reading of *noch* relates to the other readings of *noch*, in particular the temporal one.[22] It may be speculated that the extension of the domain-under-discussion is also found in the temporal reading. Suppose the domain consists of time intervals. Then temporal *noch* can be seen as indicating an extension of the time intervals under consideration such that the extension is subject to the same predicate, which is close to the view in Doherty (1973). Yet another open issue is the question of what is added in examples like (58a) – schnapses or schnaps-drinking events? In the case of descriptionally identical events, *noch* must be combined with *mal* ('times'), which is a light noun denoting

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[22] The relation between the comparative and the additive reading is discussed in Umbach (2009).

events, cf. (58b). This is evidence that the items added in (a) are in fact individuals, licensing the conclusion that *noch* need not generally operate on events. In contrast, Greenberg in her analysis of English additive *more* argues that, even if combined with a nominal, additive *more* denotes a measure function on eventualities, and *one more schnaps*, as in (59a), is interpreted by abstracting over events involving schnapses and counting their number (cf. Greenberg 2009). Similarly, the notions of repetition discussed in Tovena & Donazan (2008) are uniformly based on event structure.

(58)   a. Mittags hat Otto NOCH einen Schnaps getrunken.   (second schnaps)
       b. Mittags hat Otto NOCH mal einen Schnaps getrunken.   (second schnaps-drinking event)
           'After dinner Otto drank one more schnaps / drank a schnaps again.'

Finally, there is the issue of translations and paraphrases, cf. (59). In order to translate German additive *noch* into English one has to use expressions like *in addition, another, one more,* which are by no means focus particles and instead have some kind of an (anaphoric) denotation. Why do these expressions count as translational equivalents? Similarly, why is German (*ein*) *weiterer* an adequate paraphrase for *noch* (*ein*), although it is an adjectival predicate instead of a focus particle?

(59)   a. Otto had another / an additional / one more schnaps.
       b. Otto hat noch einen / einen weiteren / einen zweiten Schnaps getrunken.

Natural languages obviously come with a number of ways to realize additivity, ranging from focus particles and comparative expressions to anaphoric predicates. In this paper we compared two focus particles within one language. It will be exciting to broaden the perspective and compare different strategies of additivity across languages.

References

Beaver, David & Brady Clark (2008) Sense and Sensitivity. How Focus Determines Meaning. Wiley-Blackwell.
Beaver, David & Henk Zeevat (2007) Accommodation. In G. Ramchand and C.Reiss (eds.) The Oxford Handbook of Linguistic Interfaces. Oxford University Press, 502-38.
Büring, Daniel (2003) On D-Trees, Beans and B-accents. In: Linguistics and Philosophy 26(5), 511-545.
Doherty, Monika (1973) "Noch" and "Schon" and their presupposition. In F. Kiefer and N. Ruwet (eds.) *Generative Grammar in Europe*. Reidel, Dordrecht, 154-177.
Eckardt, Regine (2006) *Was noch?* Navigating in Question Answer Discourse. In: Andreas Späth (ed.), Interface and interface conditions. Berlin: Mouton DeGruyter.
Eckardt, Regine (in this volume) Particles, *Maximize Presupposition* and Discourse Management.
Féry, Caroline (2010) Prosody and information structure of the German particles 'selbst', 'wieder' and 'auch'. In: Borowsky, Toni, Shigeto Kawahara, Takahito Shinya and Mariko Sugahara (eds.) Prosody Matters: Essays in Honor of Elisabeth O. Selkirk. London: Equinox Press.
Greenberg, Yael (2009) Additivity in the domain of eventualities. Proceedings of the Tenth Symposium on Logic and Language - LoLa10, Hungarian Academy of Sciences
Ippolito, Michela (2007) On the meaning of some focus-sensitive particles. *Natural Language Semantics* 15:1–34.
Krifka, Manfred (1999) Additive particles under stress. In: A. Lawson D. Strolovitch (ed.). Proceedings of SALT 8. Ithaca, NY: CLC Publications, 111–128.
Krifka, Manfred (2000) Alternatives for aspectual particles. Paper presented at the Berkeley Linguistics Society.
Krifka, Manfred (2001), "For a structured account of questions and answers", in Caroline Féry & Wolfgang Sternefeld, *Audiatur vox sapientiae. A Festschrift for Arnim von Stechow*, Berlin, Akademie-Verlag, 287-319.
Krifka, Manfred (2007) Basic Notions of Information Structure. In Féry, Fanselow and Krifka (eds.) *Interdisciplinary Studies on Information Structure*, Potsdam, 2007.

König, Ekkehard (1977) Temporal and non-temporal uses of *noch* and *schon* in German. *Linguistics & Philosophy* 1, 173-198.

König, Ekkehard (1991) The Meaning of Focus Particles. A Comparative Perspective. London, New York: Routledge.

Lang, Ewald (1984) The semantics of coordination. SLCS 9, Amsterdam, Benjamins.

Löbner, Sebastian (1989) German *schon – erst – noch*: An integrated analysis. Linguistics & Philosophy 12: 167–212.

Nederstigt, Ulrike (2003) *Auch* and *noch* in child and adult German. Mouton de Gruyter, Berlin.

Reis, Marga & Inger Rosengren (1997) A modular approach to the grammar of additive particles: The case of German auch. *Journal of Semantics* 14, 237–309.

Roberts, Craige (1996) Information Structure in Discourse. Towards an Integrated Formal Theory of Pragmatics. In A. Kathol and Jae-Hak Yoon (eds.): Ohio State University Working Papers in Linguistics Vol. 49.

Rochemont, Mats (1986) Focus in generative grammar. Benjamins, Amsterdam.

Rooth, Mats (1992) A theory of focus interpretation. *Natural Language Semantics* 1, 75-116.

Roßdeutscher, Antje (2005) On-line-inferences in the semantics of *dann* and *then*. In Emar Maier, Corien Bary & Janneke Huitink (eds) *Proceedings of SuB9*, 325-339.

Sæbø, Kjell Johan. 2004. Conversational Contrast and Conventional Parallel: Topic Implicatures and Additive Presuppositions. In: Journal of Semantics 21: 199 -217.

Schwarzschild, Roger (1999) GIVENness, AvoidF and other Constraints on the Placement of Accent. *Natural Language Semantics* 7(2), 141-177

von Stechow, Arnim (1990) Focusing and backgrounding operators. In Werner Abraham (ed.), *Discourse particles* 37-84. Amsterdam: John Benjamins.

Tovena, Lucia (2006) Dealing with alternatives. *Proceedings of the 10th Sinn und Bedeutung,* 373-387.

Tovena, Lucia & Marta Donazzan (2008) On ways of repeating. In L. Tovena (ed.) *Aspect et pluralité d'événements*, Recherches linguistiques de Vincennes 37, 85-112.

Umbach, Carla (2004) On the Notion of Contrast in Information Structure and Discourse Structure. *Journal of Semantics*, Vol. 21(2), 155-175.

Umbach, Carla (2005) Contrast and Information Structure: A focus-based analysis of *but.* Linguistics. Vol. 43-1, 207 - 232.

Umbach, Carla (2009) Comparatives combined with additive particles: The case of German *noch*. In: Proceedings of Sinn & Bedeutung 13. Stuttgart.

Zeevat, Henk & Katja Jasinskaja (2007) *And* as an additive particle. In M. Aurnague, K. Korta & J. M. Larrazabal (eds.) *Language, Representation and Reasoning. Memorial volume to Isabel Gómez Txurruka*. University of the Basque Country Press, 315-340.