When additive particles can associate with *wh*-phrases[1]

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Abstract. The distribution of certain additive particles is restricted. It has been suggested that in *wh*-questions they can only associate with the *wh*-phrase if the question receives a showmaster interpretation (Umbach, 2012). I present novel data challenging this generalization and account for these data by lifting Beaver and Clark (2008)'s QUD-based account of additive particles to an inquisitive semantics setting, so that it captures the contribution of additive particles in assertions, polar questions and *wh*-questions.

Keywords: additive particles, questions, showmaster questions, summoning questions, QUD.

1. Introduction

English has several additive particles, which differ in their distribution across sentence types. In this paper, I will focus on *also*, which is a common choice to express additivity in assertions and polar questions:

(1) a. Mary **also** danced.
b. Did Mary **also** dance?

In *wh*-questions the choice of additive particle depends on the phrase with which the particle associates.[2] If it associates with a non-*wh*-phrase, as in (2), then the use of *also* is acceptable; but if it associates with the *wh*-phrase, as in (3a), then the use of *also* is marked—we will discuss how exactly it is marked in the following section. In order to express additivity in this latter case, speakers typically employ *else*, as in (3b).

(2) Lots of people danced the WALTZ. But who **also** danced the JIVE?

(3) a. JOHN danced the waltz. #Who **also** danced the waltz?
b. JOHN danced the waltz. Who **else** danced the waltz?

This paper investigates under which circumstances it is acceptable for *also* to associate with a *wh*-phrase. We will derive the basic distributional properties of *also* and *else* and discuss how these properties interact with certain non-canonical questioning scenarios.

The paper is structured as follows. Section 2 introduces the key data. Section 3 provides some background on additive presuppositions and the question-under-discussion model in which the account will be formulated. In Section 4 a generalized additive presupposition is proposed, and in Section 5 it is demonstrated how this presupposition accounts for the distribution of *also* in assertions, polar questions and different kinds of *wh*-questions. Section 6 concludes.

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[2]To be precise, in assertions and polar questions, the acceptability of *also* depends on the associated phrase as well: e.g., *also* is marked when it associates with non-specific indefinite phrases or universal quantifiers. While the current paper doesn't focus on these data points, they are predicted, both on Beaver and Clark (2008)'s account, introduced in Section 3, and on the account proposed here.

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2. *Also* in showmaster questions and summoning questions

There are several recent papers that discuss the differences between the two German additive particles *auch* and *noch* (Umbach, 2012; Grubic, 2017: also see Eckardt, 2006).[3] Though these accounts are concerned with data from German, they are immediately relevant for us, since, as we will see, the pertinent differences between *auch* and *noch* correspond to those between *also* and *else*. Here I discuss a generalization about *auch* due to Umbach (2012) and challenge it on the basis of previously unnoticed data.

2.1. Showmaster questions

Umbach (2012) maintains that *auch* can only associate with the *wh*-phrase in a *wh*-question if the question is interpreted as a *showmaster question*, i.e., a question the speaker asks while already knowing the answer. Typically, a speaker will ask a showmaster question in order to prompt the hearer to say the answer out aloud. As an illustration, Umbach provides the example in (4), which involves three people, Little Lisa, Lisa's mother, and Auntie. Since Auntie has been to the zoo with Lisa, she knows the answer to the question in (4); she is merely trying to prompt Lisa to tell her mother the answer too.

(4) [Little Lisa tells her mother what happened when she visited the zoo with Auntie.]
Auntie to Lisa: Und was ist im Zoo auch passiert?
Auntie to Lisa: And what also happened at the zoo? (Umbach, 2012: 1845)

Observe that *auch* is acceptable in (4), although it associates with the *wh*-phrase. English *also* patterns with *auch*: the English translation of (4) receives a showmaster interpretation and it seems to be this interpretation that makes *also* acceptable.

Other possible scenarios for showmaster questions include oral examinations, as in (5), or lively narrative discourses such as (6). Again, both *auch* and *also* are acceptable in these examples.

(5) [Examiner after student has given an incomplete answer:]
Gut, aber was ist 1776 auch passiert?
Good, but what also happened in 1776?

(6) Ich stand vor dem Eingang, und wer stand da plötzlich auch?
I was standing in front of the entrance, and who also stood there all of a sudden?
(Reis and Rosengren, 1997: quoted from Umbach, 2012)

2.2. Extant accounts of *also* in showmaster questions

Umbach (2012) herself and Grubic (2017) have suggested explanations for why *auch* can appear in showmaster questions. I critically discuss both accounts, starting with Grubic's proposal.

[3]For a recent investigation into the semantics of additive particles in questions, albeit with a different focus than that of the current paper, also see Schmitt (2018).

2.2.1. Grubic (2017)

Grubic's account is formulated in a *question-under-discussion* (*QUD*) framework and treats *auch* as signaling that a previously addressed QUD gets re-opened with respect to a larger *wh*-domain.[4] According to Grubic, the showmaster effect is pragmatic and stems from Gricean reasoning along the following lines. A speaker will only re-open a QUD with respect to a larger *wh*-domain if she has a reason to do so. A plausible reason is that the speaker thinks that in the previously given answer relevant alternatives were forgotten or ignored.

A problem I see with this line of explanation is that it only derives a relatively weak implicature, namely that the speaker considers the existing answer incomplete—not that she already knows the answer to the *auch*-question. This is problematic because a scenario in which the speaker merely thinks the answer is incomplete doesn't seem to license *auch*. For instance, in (7), if B merely considers A's answer incomplete but doesn't know which exact books A read over the summer, then it isn't acceptable for B to use *also*.

(7) [Over the summer, every student has to read two books of their choice. Back at school, A is reporting what she read:]
A: On vacation, I read Emma.
B: Okay, cool. #Und was hast du auch gelesen?
B: Okay, cool. #And what did you also read?

2.2.2. Umbach (2012)

Umbach's explanation for the showmaster interpretation is based on the following reasoning. If additive particles associate with a *wh*-phrase, they follow their associated phrase rather than preceding it. This configuration—an additive particle following its associated phrase—shows up not only in questions, but also in assertions (Altmann, 1976), as illustrated in (8).

(8) Mary danced, and John ALSO danced.

Krifka (1998) argues that if an additive particle appears in this configuration, its associated phrase is a *contrastive topic* (cf. Jackendoff, 1972; Büring, 2003). Now, since *auch* in the relevant questions associates with the *wh*-phrase, Umbach concludes that the *wh*-phrase must be a contrastive topic. According to Umbach, contrastive topics need to be referential, but *wh*-phrases are not referential in a suitable way. She concludes that if *auch* associates with the *wh*-phrase, it coerces a referential interpretation of the *wh*-phrase, and that this is the cause of the showmaster interpretation:[5]

[4] I summarize only those features of Grubic's proposal that are relevant for the showmaster effect. Her full account uses situation semantics (Kratzer, 2011) and captures a range of differences between *auch* and *noch*. It treats *auch* as signallig that the QUD gets re-opened with respect to the same *topic situation* but a different *resource situation*. Since Grubic additionally assumes that QUDs cannot get re-opened with respect to the same topic situation and a smaller domain, this means that for her *auch* signals a re-opening of a QUD with a larger domain.

[5] This argument is problematic. In particular, referentiality is not the same as specificity. If the *wh*-phrase refered to a plurality of individuals, e.g., the whole *wh*-domain, then, as far as I can see, it would be referential but the speaker wouldn't know the answer. However, it is indeed an interesting question whether *wh*-phrases can be contrastive topics (CTs), and if so, how this may be derived in a theory of CTs. The problem might be similar to

> "...The wh-word is, as a rule, unsuited to serve as a contrastive topic because it is not referential. However, in showmaster 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." (Umbach, 2012: 1858)

This means that Umbach's account predicts a showmaster interpretation to arise whenever *auch* associates with the *wh*-phrase. We are now going to see some novel data not in line with this prediction.

2.3. Summoning questions

Umbach's prediction is too strong. Not all questions in which *auch* associates with the *wh*-phrase receive a showmaster interpretation. A case in point are a certain class of questions, which to my knowledge have not been discussed in the literature so far. I will refer to them as *summoning questions*. A summoning question is a question that typically is posed directly to a group of people, with the aim of finding out who of these people have a certain property.

(9) Who here is taking this course for credit? Raise your hands!

As shown in (10), summoning questions can host *auch*/*also* without showmaster effect. In (10a) and its English translation, for instance, the question of who wants an ice cream is genuine: the speaker doesn't have anybody particular in mind, contrary to what Umbach's account would predict.

(10) a. Wer will **auch** ein Eis?
*Who **also** wants an ice cream?*
b. Wer ist **auch** dafür zu gehen?
*Who is **also** in favor of leaving?*
c. Wer von euch ist **auch** bei Snapchat?
*Who here is **also** on Snapchat?*

Finally, note that by default the speaker will act as the antecedent for the additive particle in summoning questions. In (10a), for example, the speaker is presupposing that she herself wants an ice cream.[6] However, as illustrated in (11), it doesn't seem necessary for licensing *auch*/*also* that the speaker is the antecedent.

(11) Ich geh gleich ein Eis für Maria holen. Wer von euch will auch eins?
I'm getting an ice cream for Mary. Who of you guys also wants one?

2.4. Summary of the data

Let's recap the empirical picture. We have seen that, while *also*/*auch* can easily appear in assertions and polar questions, these particles are only acceptable in a canonical *wh*-question if they don't associate with the *wh*-phrase. If they do associate with this phrase, they are only

that posed by generalized quantifiers acting as CTs (Rooth, 2005; Constant, 2014; Chapter 4).

[6] It's an interesting question, though probably orthogonal to our purposes here, why additive presuppositions in summoning questions can be accommodated so easily, whereas they have been observed to resist accommodation in other environments (Kripke, 1991/2009).

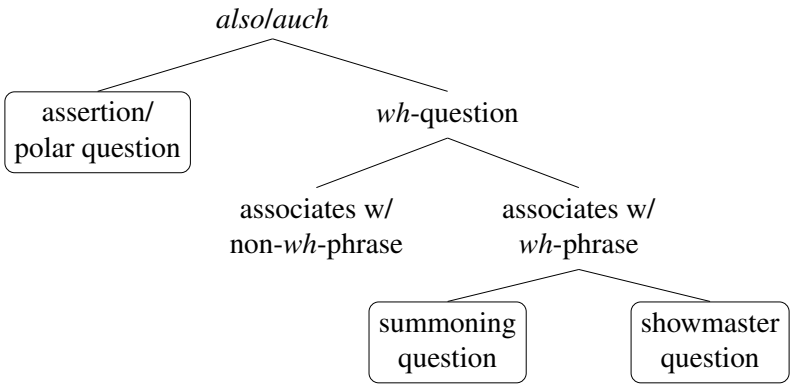


Figure 1: Distribution of *also/auch*

acceptable if their containing question is a summoning question or a showmaster question. This distribution is summarized in Figure 1.

In this paper, we will only account for a subset of these data, leaving aside for now the case where *also/auch* appears in a *wh*-question but associates with a non-*wh*-phrase (that is, we will account for all the boxed cases in Figure 1).

3. Background on additive presuppositions

Before turning to our positive proposal in the next section, we will review some basic properties of additive particles and see how these properties can be captured in a QUD framework.

3.1. Focus sensitivity

Additive particles are focus-sensitive. Their presupposition depends on the focus structure of their containing sentence. For example, (12a), where *dog* is focused, presupposes that John gave something other than a dog to Mary, while (12b), where *Mary* is focused, presupposes that John gave a dog to someone other than Mary.

(12) a. John also gave a $[\text{dog}]_F$ to Mary.
$\rightsquigarrow$ John gave something other than a dog to Mary.
b. John also gave a dog to $[\text{Mary}]_F$.
$\rightsquigarrow$ John gave a dog to somebody other than Mary.

This focus sensitivity can easily be implemented in alternative semantics (Rooth, 1992): if *also* appears in a sentence S, then it presupposes that there is a true alternatives p in the focus semantic value of S such that p is different from the ordinary semantic value of S. We will refer to the first part of this presupposition as the EXISTENCE condition and to the second part as the NON-IDENTITY condition. For example (12b) above, these conditions amount to the following.

(13) John also gave a dog to MARY.
$\rightsquigarrow$ There's a true $p \in [\![\text{John gave a dog to MARY}]\!]^F$ s.t. $p \neq [\![\text{John gave a dog to MARY}]\!]^0$
EXISTENCE NON-IDENTITY

It has been suggested in the literature that this formulation falls short, though: both EXISTENCE and NON-IDENTITY have been argued to be too weak to capture the empirical picture.

3.2. EXISTENCE is too weak

Kripke (1991/2009) points out that additive presuppositions are different from many other presuppositions: they can't be accommodated or satisfied by common ground knowledge. If they could be, then we would expect (14) to be acceptable out of the blue—after all, it is well known that, any given night, several million people have dinner in New York. So, if the additive presupposition was just an existential statement, it could easily be accommodated.

(14) Sam is having dinner in New York tonight, too. (Kripke, 1991/2009)

Kripke suggests that additive particles, rather than contributing a simple existential statement, are anaphoric: in (14), *too* seems to require that, of some particular individual other than John, it has been saliently established in the discourse that they are having dinner in New York tonight.

3.3. Focus sensitivity via Current Question

Beaver and Clark (2008) suggest a way of capturing the discourse anaphoricity and focus sensitivity of additive particles in a question-under-discussion-based framework (Roberts, 1996). In this framework, focus sensitivity can be modeled without directly making reference to focus semantic values. Instead, it is assumed that every assertion addresses a so-called *Current Question* (*CQ*). This CQ can either be an explicitly asked question or it can remain implicit. In the latter case, it can be deduced from the focus structure of the assertion. This is possible because of *question-answer congruence*: if an assertion A answers a question Q, then A has focus marking on that constituent that corresponds to the *wh*-phrase in Q. For example, (15) is taken to be associated with the CQ *What did Mary give John?*, whereas (16) is taken to be associated with the CQ *Who gave John a dog?*.

(15) [CQ: **What** did Mary give John?]
Mary gave John a $[\text{dog}]_F$.

(16) [CQ: **Who** gave John a dog?]
$[\text{Mary}]_F$ gave John a dog.

This connection between focus marking and CQ allows Beaver and Clark to capture the EXISTENCE condition in terms of the CQ. Roughly, they take an additive particle to signal that a positive partial answer to the CQ has saliently been established in the discourse. For example, *also* in (17) is taken to mark that a positive partial answer to *What did John read?* has saliently been established.

(17) [CQ: **What** did John read?]
John also read $[\text{Middlemarch}]_F$.

3.4. NON-IDENTITY is too weak

The NON-IDENTITY condition as formulated in Section 3.1 has also been subject to criticism, with both Jasinskaja and Zeevat (2009) and Beaver and Clark (2008) proposing a strengthened version of this condition. Beaver and Clark require that the already established partial answer, i.e., the antecedent, is not entailed by the prejacent of the additive particle. To motivate this decision, they refer to on the oddness of discourses like those in (18).

(18) a. Sam is [happy]$_F$. #He's also [ecstatic]$_F$. (after Beaver and Clark, 2008)
b. I called [Alice]$_F$. #I also called [Alice and Mary]$_F$.
c. Alice [sang]$_F$. #She also [sang beautifully]$_F$.

These are all cases where the prejacent of the additive particle entails the antecedent. Observe that with entailment in the opposite direction, however, the discourse is degraded too:

(19) a. Sam is [ecstatic]$_F$. #He's also [happy]$_F$.
b. I called [Alice and Mary]$_F$. #I also called [Mary]$_F$.
c. Sam has a [brother and a sister]$_F$. #He also has [siblings]$_F$.

One might think that these data can be explained as cases of redundancy. But the degradedness seems to persist even if we take care to construct non-redundant discourses, e.g., discourses that guide through a reasoning process step by step or explain the meaning of a word:

(20) a. Sam is [ecstatic]$_F$. That means that he is (?#also) [happy]$_F$.
b. I called [Alice and Mary]$_F$. This means in particular that I (#also) called [Mary]$_F$.
c. Sam has [a brother and a sister]$_F$. That means that Sam (#also) has [siblings]$_F$.

Leaving out the additive particle does seem to improve acceptability, which suggests that the problem is indeed caused by the additive particle. I conclude that the non-identity condition needs to be strengthened into both directions: prejacent of the additive particle and antecedent need to be logically independent.

This concludes our discussion of additive particles in assertions. In the following section, we will formulate a generalized and strengthened version of Beaver and Clark's account. It will be *generalized* in that it can apply not only to additives in assertions, but also in polar questions and *wh*-questions; and it will be *strengthened* in that it implements the NON-IDENTITY condition in terms of logical independence.[7]

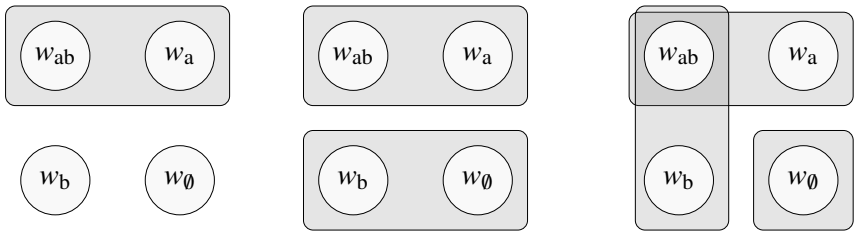
4. Generalizing the additive presupposition

4.1. Resolutions and positive partial resolutions

To formulate a unified additive presupposition, we will borrow some notions from inquisitive semantics (Ciardelli et al., 2019).[8]

[7]For related work that is concerned with lifting the account of another kind of focus-sensitive expression, namely exclusive particles, to an inquisitive semantics setting, see Möller Kalpak (2018). A comparison of this approach with the one proposed here must be left for future work.

[8]This choice is motivated by conceptual reasons. Inquisitive semantics is a framework specifically designed to deliver a uniform notion of meaning for declarative and interrogative sentences. Adopting this notion here will



(a) Amy left. (b) Did Amy leave? (c) Who left?

Figure 2: Examples of sentence meanings in inquisitive semantics.

4.1.1. Resolutions

In inquisitive semantics, the meaning of both declaratives and interrogatives is construed as the same kind of semantic object, namely a set of propositions. By uttering a sentence with meaning P, a speaker is taken to raise an issue whose resolution requires establishing one of the propositions in P, while at the same time providing the information that the actual world is contained in the union of these propositions, $\bigcup P$. We call the elements of P *resolutions* of the sentence. The difference between declaratives and interrogatives is that, by uttering a declarative, a speaker raises a trivial issue, i.e., she provides enough information in order to resolve the issue she raises. Uttering an interrogative sentence, by contrast, raises a non-trivial issue.

Sentence meanings in inquisitive semantics are *downward closed*: if $p \in P$ and $q \subset p$, then also $q \in P$. This captures the intuition that, if a proposition p resolves a given issue, then any stronger proposition $q \subset p$ will also resolve that issue. Given a set of propositions P, we call $P^{\downarrow} = \{p \mid \exists q \in P : p \subseteq q\}$ the *downward closure* of P.

To illustrate these notions, consider the following three sentences:

(21) a. Amy left.
b. Did Amy leave?
c. Who left?

Assuming a domain with exactly two individuals, Amy and Bill, these sentences may be assigned the meanings depicted in Figure 2, where w_{ab} and w_a are worlds where Amy left, w_b and $w_\emptyset$ are worlds where Amy didn't leave, w_{ab} and w_b are worlds where Bill left, and w_a and $w_\emptyset$ are worlds where Bill didn't leave. The shaded rectangles are the least informative propositions contained in the given meanings. By downward closure, all propositions contained in one of these alternatives are also included in the meanings of the sentences.

4.1.2. Positive partial resolutions

For our account of additive particles, we won't use resolutions simpliciter, but a closely related notion that we will refer to as *positive partial resolutions*.

provide a stronger conceptual underpinning for the proposed account. It is not a technical necessity, however: the same predictions could in principle be achieved without using concepts from inquisitive semantics.

Partial resolutions. A *partial resolution* is to a resolution what a partial answer is to an answer: to be a partial resolution of a sentence S, a proposition p doesn't have to resolve the issue raised by S completely, but it is sufficient if p rules out some resolution in the meaning of S. For instance, consider the sentence meaning  . Among its partial resolutions are  ,  and  , none of which however are resolutions.

To see why partial resolutions are the relevant notion when it comes to modeling additive presuppositions, consider (22). In both examples, the use of the additive particle is licensed by a merely partial resolution.

(22) a. Alice invited John or Mary, I don't remember which. She also invited Bob.
b. Someone from your soccer team called. Your grandmother also called.

Positive partial resolutions. Intuitively, a *positive partial resolution* is a resolution that partially resolves a given issue positively. In the case of a polar question, it is a non-empty resolution entailing the *yes*-reply. A positive partial resolution of a *wh*-question is a non-empty partial resolution entailing a *somebody*/*something*-reply. For instance, consider again the sentence meaning  . Examples of positive partial resolutions are  ,  and  . Examples of propositions that are partial resolutions but not *positive* partial resolutions are  and .

To see why positive partial resolutions are needed for licensing additive particles, consider (23). In the first sentences of both examples, the CQ gets (partially) resolved, but not positively. As a consequence, the use of an additive particle is not acceptable.

(23) CQ: Who called?
a. John didn't call. #Alice also called.
b. Nobody called. #Alice also called.

To give a formal definition of positive partial resolutions, we need one additional concept, namely that of *highlighting* (see, e.g., Roelofsen and Farkas, 2015). This notion is used to capture which semantic objects a sentence makes salient.[9] For example, both the polar interrogative in (24a) and the declarative in (24b) are taken to highlight the proposition that Ann watched Psycho, i.e., $\lambda w.W(p)(a)(w)$. The single-*wh*-question in (24c) is taken to highlight the 1-place property of having been watched by Ann, i.e., $\lambda x.\lambda w.W(x)(a)(w)$, and the multiple-*wh*-question in (24d) is taken to highlight the relation $\lambda y.\lambda x.\lambda w.W(x)(y)(w)$.

(24) a. Ann watched Psycho. $\rightsquigarrow \lambda w.W(p)(a)(w)$ 0-place property
b. Did Ann watch Psycho? $\rightsquigarrow \lambda w.W(p)(a)(w)$ 0-place property
c. What did Ann watch? $\rightsquigarrow \lambda x.\lambda w.W(x)(a)(w)$ 1-place property
d. Who watched what? $\rightsquigarrow \lambda y.\lambda x.\lambda w.W(x)(y)(w)$ 2-place property

We can generalize over these different cases by viewing propositions as 0-place properties. All of the above sentence types then highlight an n-place property, where $n \geq 0$ is the number of *wh*-elements in the sentence.

[9]The idea that uttering a question makes certain semantic objects salient, which become available for anaphoric reference, has been used in several theories of questions (Groenendijk and Stokhof, 1984; von Stechow, 1991; Krifka, 2001; Aloni et al., 2007). Here, we use Roelofsen and Farkas (2015)'s implementation of this idea, which applies to both questions and assertions, and was motivated by the licensing patterns of polar particle responses.

With the notion of highlighting in place, we can now formally define the set of positive partial resolutions of a sentence S. Let $f : D_e^n \to D_{\langle s,t \rangle}$ be the n-place property highlighted by S. Then the set P of positive partial resolutions of S is:

$$P = \{ f(\vec{d}_i) \cup \cdots \cup f(\vec{d}_j) \mid \vec{d}_i, \ldots, \vec{d}_j \in D^n \}^{\downarrow} \setminus \{\emptyset\}$$

4.2. A generalized additive presupposition

We are now ready to formulate a generalized version of the additive presupposition.

If an additive particle occurs in a sentence S, this presupposes that:
- a positive partial resolution p of the CQ has saliently been established, and **EXISTENCE**
- there is no positive partial resolution q of S such that $q \subseteq p$. **NON-IDENTITY**

Sentence S can be a declarative, a polar interrogative or a *wh*-interrogative. In the remainder of this section, we will check which predictions the presupposition makes for these different cases.

Declaratives. Let's consider the example in (25). As we have seen in Section 3.3, this sentence addresses the CQ *What did John read?*. So, the EXISTENCE condition requires there to be a saliently established positive partial resolution p of *What did John read?*.

(25) John also read [Middlemarch]$_F$.

To find out what the NON-IDENTITY condition amounts to, we first have to determine the set of positive partial resolutions of (25). This set contains the proposition m that John read Middlemarch and all non-empty subsets of m. The NON-IDENTITY condition requires that none of these positive partial resolutions entail p. This is equivalent to requiring that p and m are logically independent.[10] So, we predict (25) to presuppose that there is a positive partial resolution p of the question what John read and that p is logically independent of the proposition that John read Middlemarch. Hence, for declaratives, the generalized version of the additive presupposition boils down to a classical additive presupposition (albeit in terms of logical independence).

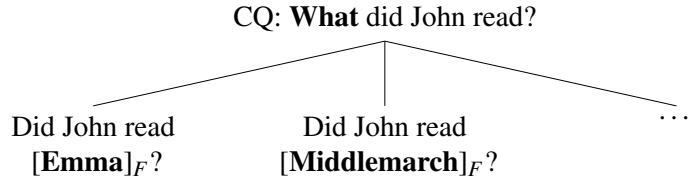
Polar interrogatives. Let's consider example (26), the polar interrogative analogue of (25). We will see that, in all relevant respects, it behaves like (25).

(26) Did John also read [Middlemarch]$_F$?

It seems to be a natural assumption (and in line with Roberts 1996's way of computing coherence) that (26) is part of a strategy for finding an answer to the *wh*-question *What did John read?*. As illustrated below, this latter question can be split up into a series of polar questions of the form *Did John read X?* such that if we know the answer to all the polar questions, we

[10] The full line of reasoning is as follows. We know that no positive partial resolution of S entails p, i.e., for all $m' \subseteq m$, $m' \not\subseteq p$ and in particular $m \not\subseteq p$. Since p is a *positive* partial resolution, we also know that $p \neq \emptyset$. Hence, for all $m' \subseteq m$, $m' \neq p$. That is, $p \not\subseteq m$. So, we have $m \not\subseteq p \not\subseteq m$, i.e., p is logically independent of m.

will also know the answer to *What did John read?*. For this reason, I will assume that *What did John read?* is the CQ of (26).[11]



Note that a principle similar to question-answer congruence is in place here: the focus-marked constituent in the polar questions corresponds to the *wh*-phrase in the CQ. This means that an assertion and its corresponding polar question have the same CQ. Furthermore, because an assertion and its corresponding polar question highlight the same proposition, they also have the same set of positive partial resolutions. So, for polar questions the generalized additive presupposition amounts to exactly the same as for assertions. For example, just like the assertion in (25), the polar question in (26) presupposes that there's a saliently established positive partial resolution p of *What did John read?* such that p is logically independent of the proposition that John read Middlemarch.

***wh*-interrogatives.** Just as with polar questions, we first have to think about how *wh*-questions relate to the CQ. We have seen earlier that the CQ can remain implicit. However, it can of course also be asked explicitly—and I think it makes sense to assume that this is what *wh*-questions without an overt domain restriction (at least in the absence of narrow focus) usually do.[12] For instance, I will assume that the unrestricted *wh*-question in (27) is part of a strategy to answer the CQ *What did John read?*, i.e., the *wh*-question itself specifies the CQ.

(27) [CQ: What did John read?]
What did John read?

I further assume that adding an expression like *also*, which doesn't contribute to the at-issue question meaning, doesn't have an effect on the associated CQ. That is, I take (28) to have the same CQ as (27).

(28) [CQ: What did John read?]
#What did John **also** read?

The fact that CQ and overtly asked question S are identical is crucial for our account of why *also* is marked in (28). The EXISTENCE condition requires that there is a saliently established positive partial resolution p of the CQ, i.e., of the question what John read. The NON-IDENTITY condition requires that this p is not entailed by any positive partial resolution q of S, i.e., of the question what John read. It is impossible to find a p that satisfies these two conditions: since S and the CQ are idential, whenever a proposition p is a positive partial resolution of the CQ,

[11] More work needs to be done to determine when exactly polar questions are part of a strategy to answer a *wh*-CQ, and when they are simply "their own CQ".

[12] We will discuss *wh*-question with domain restrictions in Section 5.

it is trivial to find a positive partial resolution q of S such that $q \subseteq p$, namely $q = p$. I take this impossibility to satisfy the additive presupposition to explain why *also* is marked in (28).

On an intuitive level, we might think of the problem as follows. When an additive particle appears in a *wh*-question and associates with the *wh*-phrase, then the NON-IDENTITY condition is much more demanding than when the particle appears in an assertion or polar question. This is because assertions and polar questions highlight a concrete proposition, and NON-IDENTITY only requires this proposition to be independent of the antecedent proposition p. By contrast, a *wh*-question doesn't "mention" a concrete proposition, but rather highlights an n-place property with $n \geq 1$. This means for a *wh*-question there are usually several different positive partial resolutions, all of which are required by NON-IDENTITY to be independent of p.

To take stock, so far we have accounted for the markedness of *also* in canonical unrestricted *wh*-questions. What remains to be done is to explain why *also* is acceptable in summoning and showmaster questions, and why *else* is acceptable in canonical *wh*-questions.

5. Ways of ensuring NON-IDENTITY

As we have seen, canonical unrestricted *wh*-questions are taken to coincide with their CQs. As a consequence, it becomes impossible to satisfy the NON-IDENTITY condition for these questions. In this section, we will discuss how *else*-marked *wh*-questions and different kinds of non-canonical *wh*-questions circumvent this problem. The crucial difference will be that with these question types the overtly asked question and the CQ are not identical, but that the CQ is a proper superquestion of the overtly asked question.

5.1. *Else*-questions and witness removal

For simplicity, we will treat *else* as an additive particle here (following Schwarz, 2017). This is motivated by the fact that, just like a bona fide additive particle, *else* in *wh*-questions gives rise to an additivity inference, as illustrated in (29b).[13]

(29) Who danced?
  a. John danced. Who **else** danced?
  b. John didn't dance. #Who **else** danced?

So, we assume that *also* and *else* contribute the same additive presupposition. What then is the relevant difference between the particles? I suggest it is that *else* but not *also* modifies the *wh*-domain of its containing question by removing the witness of the additive presupposition from that domain (Romero, 1998; Harris, 2014; Schwarz, 2017). For instance, in (30), Mary is removed from the *wh*-domain. The resulting question is what Eckardt (2006) calls a *remnant question*.

[13]Note that if *else* associates with an indefinite rather than with a *wh*-phrases, this doesn't seem to give rise to the same inference, as shown in (i). This suggests that *else* doesn't conventionally trigger an addivitity presupposition. In this paper, I treat *else* as an additive particle for reasons of exposition: assuming *else* is maximally similar to *also* makes it easier to discuss which difference between the two is relevant for the difference in their behavior in *wh*-questions. As far as I can see, nothing in the proposed account of *also* will hinge on the assumptions about *else*.

(i) John didn't dance, but someone else did.

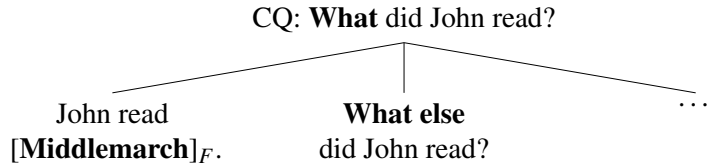
(30) A: Mary called.
B: Who else called? = Who other than Mary called?

Further evidence for this difference between *also* and *else* comes from the contrast in (31), where the speaker is the witness. In (31a), *else* tries to remove the witness from the *wh*-domain. With the *of you* restriction, however, the witness is not in the domain in the first place, which means the witness removal fails. I take this to explain why *else* is marked with the *of you* restriction.[14] By contrast, this problem doesn't arise with the *of us* restriction, because with this restriction the witness is contained in the domain. Turning to (31b), the *of you* restriction is acceptable with *also* because *also* doesn't remove the witness from the *wh*-domain. Finally, the *of us* restriction is marked with *also* for the reason discussed in Section 4.2 above: the NON-IDENTITY condition can't be satisfied.

(31) I can juggle...
a. Who else of **us/#you** can juggle?
b. Who of **#us/you** can also juggle?

Let's now have a look at why *else*, unlike *also*, can appear in canonical unrestricted *wh*-questions. In a nutshell, it will be the witness removal that saves *else* in these questions, by guaranteeing that the NON-IDENTITY condition can be met.

In order to see what the generalized additive presupposition amounts to for *else*-questions, we first have to see how such questions relate to the CQ. An *else*-question Q is a subquestion of the corresponding question without *else*, Q' (if one knows a complete answer to Q', one also knows a complete answer to Q). For this reason, Q is part of a strategy to answer Q' (cf. Eckardt, 2006). I take an *else*-question to have the corresponding non-*else* question as its CQ:



Crucially, this means that for *else*-marked *wh*-questions—unlike for unrestricted *wh*-questions—the CQ is different from the question itself. In particular, the antecedent proposition p is not a positive partial resolution of the *else*-question. This fact makes it possible to satisfy NON-IDENTITY. To see why, consider the question *What else did John read?*, and assume that the domain consists of Middlemarch, Emma and Frankenstein. According to the generalized additive presupposition, *else* signals that there is a proposition p such that:

– p is a saliently established partial resolution of *What did John read?* (=*Which of Middlemarch, Emma and Frankenstein did John read?*), and EXISTENCE

[14] An analogous explanation can be given to the following example from Eckardt (2006: 86). If *noch* is like *else* in that it removes the witness from the *wh*-domain, then the markedness of (ib) is predicted: the witness(es), namely the coffee drinker(s) from table 1, are not in the *wh*-domain, and hence can't be removed.

(i) Waitress first takes orders for coffee at table 1. Turning then to table 2, she asks:
a. Wer an diesem Tisch will AUCH Kaffee? (*Who at this table wants coffee, too?*)
b. #Wer an diesem Tisch will NOCH Kaffee? (*Who at this table wants* NOCH *coffee?*)

– there is no positive partial resolution q of *What **else** did John read?* (=*Which of Emma and Frankenstein did John read?*) such that $q \subseteq p$. NON-IDENTITY

Because Middlemarch is not in the domain of *What else did John read*, it is easy to find a proposition p satisfying the above conditions. We can simply choose p to be the proposition that John read Middlemarch. More generally, it is the presence of the witness in the *wh*-domain of unrestricted *wh*-questions that prevents NON-IDENTITY from being satisfiable. So, since *else* removes precisely the witness from the domain, with *else*-questions it will always be possible to satisfy NON-IDENTITY.

5.2. Summoning questions and domain restriction

If witness removal can save NON-IDENTITY, we would expect domain restriction more generally to be able to do the same: *also* should be acceptable in *wh*-questions whose domain has been restricted so as to not contain the witness. Consider example (32), where John is the witness. If we assume that John is not in the hearer's dorm, then the domain restriction *from your dorm* ensures that the *wh*-domain doesn't contain the witness. Indeed, adding this overt domain restriction in (32), seems to improve the acceptability of *also*.

(32) John danced all night at Mary's birthday party. Who #(from YOUR dorm) also danced?

Now, I suggest that in summoning questions a suitable restriction doesn't have to be spelled out overtly—because it is already supplied by the setup of the context. If a speaker addresses a group using a summoning question, she restricts the *wh*-domain to that group. In (33), for example, the *of you guys* restriction doesn't change the meaning of the question since the *wh*-domain would be understood to consist of the hearers even without the overt restriction.

(33) I'm getting an ice cream. Who (of you guys) also wants one?

Crucially, since the speaker is the witness in (33), the *wh*-domain doesn't contain the witness. This means that NON-IDENTITY can be satisfied, and *also* is acceptable in summoning questions.

Finally, it seems that the acceptability of *also* improves more through certain domain restrictions than others. For instance, the contextual restriction in summoning questions seems to "work better" than the overt one in (32). Those restrictions that seem to improve the acceptability of *also* the most have one thing in common: they guarantee that the witness is not contained in the *wh*-domain without relying on world knowledge. This can happen, as in *else*-questions, through grammaticalized strategies for removing the witness, or, as in summoning questions, through splitting up a situation into speaker and hearers, two groups that are guaranteed to be disjoint. By contrast, whether the witness is contained in the *wh*-domain in (32) depends on whether John is in the hearer's dorm, i.e., it depends on contingent facts about the world.

5.3. Showmaster questions and domain restriction

As we have seen, the mechanisms that allow NON-IDENTITY to be satisfied in the case of *else*-questions and summoning questions are closely related: they both result in a *wh*-domain that doesn't contain the witness. In this subsection, I will outline an account of showmaster questions on which the acceptability of *also* in these questions is explained on the basis of domain

restriction as well. There are, however, problems with this account, also to be discussed below.

The characteristic property of a showmaster question is that the speaker already has a particular answer to this question in mind. George (2011) treats questions with this property as cases of extreme domain restriction: the speaker restricts the domain to a singleton set containing only that entity she has in mind.[15] In particular, George uses the following trivia question to argue for this treatment.

(34) a. What was considered a sin in the 16th and 17th century?
b. Eating chocolate.

> "[T]here are certainly many other things that were considered sins in the centuries in question. ... [W]e understand [(34a)] as a question about which activity or activities in some suitably restricted domain was or were considered sinful, but, in the context of a trivia card, we have no way of knowing what this domain might be – the question becomes a game not of testing our trivia knowledge, but of asking us to guess which sin the author of the question was thinking of."
>
> (George, 2011: 208f)

If we adopt George's account, the acceptability of *also* falls out straightforwardly, since, from the perspective of the additive presupposition, questions with singleton domains behave just like assertions. For example, recall the zoo scenario from Section 2.1 and assume that the particular answer Auntie has in mind is that a giraffe stole Lisa's hat. Then the meaning of Auntie's question contains just a single alternative, namely the proposition that a giraffe stole Lisa's hat:

(35) $[\![\text{What also happened at the zoo?}]\!] = \{\textbf{giraffe-stole-lisa's-hat}\}^{\downarrow}$

Hence, the generalized additive presupposition for (35) boils down to the same as for the assertion *A giraffe stole Lisa's hat* or the polar question *Did a giraffe steal Lisa's hat?*. This means that, just as with assertions and polar questions, satisfying NON-IDENTITY is unproblematic here, and *also* is predicted to be acceptable.

However, there are a number of problems with the extreme domain restriction account of showmaster questions. A concrete data point challenging this account are multiple-choice questions like (36). Such questions, although they are generally showmaster questions, make their domain fully explicit by listing all possible answers. This doesn't fit with the assumption that the domain is restricted to just the answer(s) the speaker has in mind.[16]

(36) What was considered a sin in the 16th and 17th century? Was it:

(A) eating chocolate
(B) hiding chocolate eggs
(C) making chocolate without the Queen's permission
(D) feeding chocolate to a dog.

[15] George doesn't explicitly mention the term 'showmaster question', but discusses two special cases of these questions: (i) trivia questions and (ii) examples like (i), where the speaker has a particular answer to the embedded question in mind.

(i) Do you know what's awesome?

[16] Thanks to Matthijs Westera for this observation and lovely example.

A more general problem is the following. If we treat showmaster questions as cases of extreme domain restriction, their meaning only contains a single alternative, which makes them indistinguishable from assertions, at least qua their semantic content. This is problematic because much recent work on discourse dynamics is built on the assumption that the discourse effects of an utterance (at least in the absence of special marking) are derivable from its semantic content (e.g. Roberts, 1996; Portner, 2004; Farkas and Bruce, 2010; Murray, 2010). Work in this tradition might, e.g., assume that by uttering a sentence φ whose meaning contains several alternatives a speaker proposes to make $[\![\varphi]\!]$ the QUD; and if this proposal gets accepted, the hearers are required to work towards answering this QUD. By contrast, if a speaker utters a sentence φ whose meaning contains just a single alternative, she proposes to update the common ground with $[\![\varphi]\!]$. Now, if we treat showmaster questions in terms of extreme domain restriction, their meaning contains just a single alternative, and they will be predicted to have the same discourse effect as an assertion. Of course, this doesn't match what we find empirically, since showmaster questions do require the hearer to answer the question.

It seems that what we need instead of the extreme domain restriction account is an account on which the meaning of a showmaster question *restricted to the speaker's epistemic state* contains just a single alternative, while restricted to merely the common ground it still contains multiple alternatives. One way in which this can be achieved is by treating the property of "being the thing the speaker has in mind" not as the domain restriction, but as part of the question proper. That is, we assume that the showmaster question *What happened at the zoo?* can be paraphrased as (37). While $[\![(37)]\!]$ restricted to the common ground still contains several alternatives, it only contains a single alternative when restricted to the speaker's epistemic state.

(37) What thing that happened at the zoo do I have in mind?

This treatment, in combination with a slightly modified version of the NON-IDENTITY condition can still account for the distribution of *also*. Concretely, we change the NON-IDENTITY condition to require that for all *true* positive partial resolutions q of S, $q \not\subseteq p$ (rather than for *all* positive partial resolutions). Then, if we treat showmaster questions in terms of paraphrases like (37), the speaker knows which positive partial resolutions are true. So, she only needs to guarantee that these true positive partial resolutions are logically independent of p, which allows the NON-IDENTITY condition to be satisfied.

However, this account faces a problem as well. If we treat showmaster questions as paraphrases like *What thing that... do I have in mind?*, then we would also expect them to allow the same answer patterns as these paraphrases. This expectation isn't borne out, however. In (38), the negative answer by A seems fine, while in (39) it doesn't. In (39), it seems that A would have to acknowledge that B's reply is an answer to the question—just not the one she had in mind.

(38) A: What thing that happened at the zoo do I have in mind?
B: An elephant sneezed.
A: Wrong!/That's false.

(39) A: What also happened at the zoo?
B: An elephant sneezed.
A: #Wrong!/#That's false.

In sum, we have seen two possible accounts of showmaster questions. Each of them manages to capture the felicity of *also* in these questions, but each comes with problems. Finding a solution is left for future work.

6. Conclusion

I have proposed a generalized additive presupposition that captures the contribution of additive particles in assertions, polar questions, and *wh*-questions, and which accounts for the restricted distribution of *also* across these sentence types. The generalized additive presupposition requires that there is a saliently established positive partial resolution of the CQ which satisfies the generalized NON-IDENTITY condition. While with assertions and polar questions, this condition is satisfiable, with additive particles that associate with *wh*-phrases of canonical unrestricted *wh*-questions, NON-IDENTITY is impossible to satisfy. There are, however, circumstances under which NON-IDENTITY is satisfiable with *wh*-questions, namely either if the *wh*-domain is suitably restricted (as happens, e.g., in summoning questions), or if the speaker knows which positive partial resolutions of the *wh*-question are true (as happens with showmaster questions).

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