On the Form and Interpretation of Echo *Wh*-Questions

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Abstract

We argue that echo *wh*-questions are autonomous grammatical structures, and that their distinctive formal properties determine their semantics and pragmatics. Echo *wh*-sentences contain a *wh*-phrase in which the *wh*-element is narrowly focused, and a phrasal *Q* operator. *Wh*-phrase and *Q* operator determine a question semantics. Focus on *wh* determines the discourse appropriateness conditions for echo *wh*-questions, namely that an answer to the question be given in the context. A compositional analysis is provided that derives this interpretation.

1. Introduction*

This paper is about a peculiar non-canonical type of *wh*-questions, so-called echo *wh*-questions [E*wh*Qs] as illustrated in (1). Capitalization indicates main stress and "(/)" indicates a final rise, which these questions typically have.

(1) a. Tom invited WHO? (/)
b. Will Jane go WHERE? (/)
c. Down with WHAT? (/)

E*wh*Qs share with canonical *wh*-questions [*Wh*Qs] the *wh*-expression and the *wh*-question meaning: The *wh*-expression marks a gap that the speaker expects the hearer to close. What is non-canonical about them is almost everything else: As already visible in (1), E*wh*Qs have conspicuously distinctive form properties, and they are subject to a discourse constraint giving rise to a conspicuous 'echo effect': Unlike *Wh*Qs, E*wh*Qs convey the impression that the *wh*-expression marks a gap the discourse participants know *has been closed before*, in the typical case – dialogue sequences like (2) – by the utterance the E*wh*Q reacts to/'echoes'.

(2) a. A: Tom invited our president for dinner tomorrow night.
B: Tom invited WHO? (/)
b. A: Jane got a job offer but will she really go to Belize?
B: Will Jane go WHERE? (/)
c. A: Down with digital repression!
B: Down with WHAT? (/)

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There is a considerable amount of literature on E*wh*Qs (for references and discussion see especially Poschmann 2015) but no really satisfactory analysis of their particular form and how it relates to their particular echo question function. The major problem is, we claim, that the unique information structural properties of E*wh*Qs have never been correctly appreciated, and thus their potential for affording a truly compositional analysis of E*wh*Qs – that is an analysis accounting for all their distinctive formal properties *and* deriving from them their semantics (a *wh*-question) and pragmatics (discourse constraints/echo effect) – has been missed. It is the aim of our paper to provide such an analysis.

In section 2 we discuss the salient properties of E*wh*Qs to be accounted for. In 2.1 we sketch the overt formal properties of E*wh*Qs and in 2.2 their discourse properties. In 2.3 we specifically address the clausal question operator *Q*, which is standardly taken to be part of *Wh*Qs, and show that it is systematically absent from E*wh*Qs – echo *wh*-phrases behave as non-operators, and E*wh*Qs as a whole as a non-interrogative clause type. An interim summary is given in 2.4. A crucial result of section 2 is that the *wh*-element in the echo *wh*-phrase is narrowly focused, and that a compositional interpretation of E*wh*Qs has to be based on this.

In section 3 we position our proposals relative to the literature on E*wh*Qs. Section 3.1 is a preview of our analysis, and section 3.2 explains where we differ from previous proposals.

Our analysis is worked out in section 4. We argue in section 4.1 that the non-operator status of echo *wh*-phrases derives from their uniquely containing a phrasal *Q* binding the *wh*-variable, and offer a speculative account of the 1:1 correlation between operator status of *wh*-phrases and their respective focus structure. Section 4.2 presents our proposal for how to interpret focus on *wh*; we suggest that it introduces a deictic/anaphoric alternative into the interpretation at the level of alternative semantic values. Based on this, we develop our compositional analysis of E*wh*Qs in section 4.3.

Section 5 follows up on some consequences of our account, such as intervention effects and further related data. Our conclusions are presented in section 6.

Before we proceed, a comment on the data we discuss and analyze: Concretely, we propose our analysis of E*wh*Qs just for English and German. For ease of exposition we use English data throughout, adding E*wh*Q data from German whenever it is useful for the discussion. We anticipate that core properties of our analysis will carry over to other languages; a brief outlook is presented in section 5.

2. Properties of E*wh*Qs[1]

2.1. Formal properties

As pointed out in the introduction, there is a striking interpretive difference between E*wh*Qs and *Wh*Qs: E*wh*Qs are interpreted as *wh*-questions with an *echo effect*. This subsection discusses the syntax and information structure of E*wh*Qs. Our goal is to pin down the formal differences between E*wh*Qs and *Wh*Qs in order to derive the interpretive difference from them.

An immediately salient difference concerns the E*wh*Q-specific *wh*-expression ('echo *wh*-expression' [E*wh*E] for short). E*wh*Es have the property (wh *focus*) below:

[1] Sections 2, 3, and parts of 4 draw heavily on observations, arguments, and results presented (and modified) in various studies of echo *wh*-questions over the years, see in particular Reis (1992, 2012, 2016: §§2-5). For practical reasons we refrain from detailed references.

(wh *focus*) E*wh*Es bear obligatory main stress/narrow focus on their *wh*-part.

(wh *focus*) contrasts with *Wh*Qs, where narrowly focused *wh*-words require main stress on the syllable bearing lexical accent, which in English and German is always the last syllable. The difference is clearly brought out by polysyllabic *wh*-words – of which German, unlike English, has many – where the last syllable is invariably the non-*wh*-part, cf. the *Wh*Qs with narrowly focused *wh*-words in (3a-c) with their E*wh*Q counterparts (4a-c). But it is also confirmed by complex *wh*-expressions, which occur in German and English alike: While complex *wh*-phrases in *Wh*Qs allow narrow focus/main stress on any part representing non-*wh* content depending on the intended information structure, cf. (3d-f), the analogous expressions in E*wh*Qs are invariably stressed on their *wh*-part, cf. (4d-f).[2]

(3) a. [Tom wurde bestraft, ich weiß.]
[Tom became punished I know]
'[Tom was punished, I know.]'
Aber waRUM/*WARum wurde er denn bestraft? (\)
But why became he $denn_{MP}$ punished
'But WHY was he punished?'

b. [Ich weiß, DASS Tom gegangen ist, aber nicht]
[I know that Tom gone is but not]
'[I know that Tom went away, but not ...]'
woHIN/*WOhin er gegangen ist.
where-TO he gone is
'WHERE he went.'

c. [Er sagt, dass das ein guter Punkt ist,]
[he says that tha a good point is]
'[He says this is good point]'
aber inwieFERN/*inWIEfern ist es das? (\).
but in-how-far is it that
'but in what WAYS is it a good point?'

d. But how MUCH / how much of the LOOT did he get? (\)
Aber wie VIEL / wie viel von der BEUte bekam er? (\)

e. [Oh, Tom is a teacher.] Which SUBject does he teach? (\)
[Oh, Tom ist Lehrer.] Welches FACH unterrichtet er? (\)

f. But how BIG a loss / how big a LOSS is that? (\)
Aber ein wie GROßer Verlust / ein wie großer VerLUST ist das? (\)

(4) a. Tom wurde WARum / *warUM bestraft? (/)
Tom got why punished
'Tom was punished WHY?'

b. Tom ging WOhin / *woHIN? (/)
Tom went where
'Tom went WHERE?'

[2] Note that E*wh*Es are always *minimal* phrases (due to the property (wh-*non-op*) discussed next, see also section 4.1/note 16), so 'complex echo *wh*-expression' means: a non-minimal phrase of arbitrary category containing such a minimal E*wh*E.

c. Das ist inWIEfern / *inwieFERN ein guter Punkt? (/)
this is in-how-far a good point
'This is a good point in WHAT ways?'
d. He got HOW much / *how MUCH of the loot? (/)
Er bekam WIE viel / *wie VIEL von der Beute? (/)
e. Tom teaches WHICH subject / *which SUBject? (/)
Tom unterrichtet WELches Fach / *welches FACH? (/)
f. That is HOW big a loss / *how BIG a loss / *how big a LOSS? (/)
Das ist ein WIE großer Verlust /*ein wie GROßer Verlust /*ein wie großer VerLUST? (/)

The property (wh *focus*) will be crucial for our analysis. (For further discussion of this property, see sections 3.2 and 5.4).

Next, we address the facts suggesting that E*wh*Es do not undergo *wh*-movement and that they are not *wh*-operators syntactically. In support of this point, note first that unlike *wh*-phrases in *Wh*Qs, E*wh*Es may stay in situ (4) or in otherwise licensed clausal positions, see (5a,b), where the positional variation is due to Heavy NP Shift and Scrambling respectively.

(5) a. He donated HOW much money to this? (/) / He donated to this HOW much money? (/)
b. Er studiert WO ab jetzt? (/) / Er studiert ab jetzt WO? (/)
he studies WHERE from now / he studies from now WHERE
'He'll be studying WHERE from now on?'

Moreover, E*wh*Es may occupy constituent slots in E*wh*Qs, in particular NP and V projection slots (VP, IP, (root) CP), that are off limits in *Wh*Qs, see (6).

(6) a. The composer is Tony WHO? (/)
b. You are giving him a WHAT? (/) / He knows the WHO? (/)
c. He'll WHAT? (/) / He WHAT? (/) / WHAT? (/)

Scopally, E*wh*Es differ from *wh*-phrases in *Wh*Qs as well: they always have 'root scope'. Consider (7a) vs. (7b): Whereas (7a) is, as a whole, an assertion, with *where* just having scope over the *Wh*-complement, (7b) is, as a whole, an Ew*h*Q, *i.e.* the E*wh*E *WHERE*, while in the same position as *where* in (7a), has scope over the entire clause.

(7) a. It is obvious who lived where. (\)
b. It is obvious who lived WHERE? (/)

In fact, E*wh*Es are unfit to occupy *wh*-operator positions, as shown by their failure to occur in the initial XP position of the embedded clauses as in (8), an unambiguous *wh*-operator position.[3]

(8) a. *It is obvious a WHAT you are giving him? (/)

[3] Stressed/focused monosyllabic *wh*-expressions are ambiguous between an E*wh*E and a regular *wh*-phrase reading (where stress/focus pertains to the entire *wh*-phrase or, contrastively, to their sortal meaning part), so structures like (i) also have an acceptable *wh*-complement reading (plus a *yes-no* echo reading of the entire clause, which is of no interest here). But in the E*wh*E reading – in which the *wh*-phrase would have root scope – (i) is out.

(i) It is obvious WHERE he lived.

b. *Es ist klar, inWIEfern das ein guter Punkt ist? (/)
it is clear in-HOW-far this a good point is
intended: [*]'It's clear in WHAT ways this is a good point?'

This means that E*wh*Qs cannot be embedded. It also sugggests that E*wh*Es are not *wh*-moved, *i.e.* that apparent E*wh*Qs with the *wh*-phrase in clause-initial position as in (9), are either no syntactic E*wh*Qs or the initial position is a non-operator position. The former is true for English cases like (9a) where the initial *wh*-phrase clearly occupies a *wh*-operator position: While allowing for an echo interpretation, they are syntactically normal *Wh*Qs, which is confirmed by their ruling out un-ambiguous E*wh*Es as in (10a) (see also Sobin 2010). The latter is true for cases like (9b,c): In the English case (9b), the E*wh*E arguably occupies the subject position, and since the initial position of German verb-second clauses hosts *wh*-operator and topicalized non-*wh*-phrases alike, initial E*wh*Es as in (9c) may well be topicalized rather than *wh*-moved phrases. Moreover, *wh*-phrases that are unambiguously E*wh*Es, are tolerated in either case, see (10b,c), which confirms that the E*wh*Es in (9b,c) are in non-operator positions.

(9) a. WHO did he meet? (/)
b. WHO is in town? (/)
c. WAS hat er gekauft? (/)
WHAT has he bought
'He bought WHAT?'

(10) a. *The WHO did he meet? (/)
b. The WHO is in town? (/)
c. Ein WAS hat er gekauft? (/)
a WHAT has he bought
'He bought a WHAT?'

We conclude that E*wh*Es are never *wh*-moved at all. E*wh*Es *always* occupy non-operator positions.

Two further observations confirm the non-*wh*-operator status of E*wh*Es. First, E*wh*Es do not interact with *wh*-phrases or other clause type features of their base structure (or elements licensed by them). Cases in Point are (11) and (12): Whereas (11a) and (12a), which involve regular *wh*-phrases only, violate superiority or cause an intervention effect, their E*wh*Q counterparts are fine, cf. (11b) and (12b).

(11) a. *What did who buy? (\)
b. What did WHO buy? (/)

(12) a. *Wen hat niemand wo gesehen? (Beck 2006: 4)
who has nobody where seen
'Who did nobody see where?' (\)
b. Wen hat niemand WO gesehen? (/)
who has nobody WHERE seen
'Who did nobody see WHERE?'

Second, E*wh*Es may appear in structures of all kinds, thus forming E*wh*Q structures of all kinds. Previous examples include E*wh*Qs mainly with declarative but also *yes-no*-interrogative and direct-

ive fragment structure, cf. (1); further examples with imperative, *wh*-interrogative, optative sentence structure and certain small clause structures are provided in (13). The interpretation of the E*wh*Qs in non-declarative form is not properly described by taking them to be *wh*-questions (*i.e.* sets of propositional answers, cf. section 4).

(13) a. Call WHO? (/)
b. When will he call WHO? (/)
c. If only he'd gone WHERE? (/)
d. Him wear WHAT? (/)
e. Down with WHO? (/)

In sum, these observations lead us to the generalization (*non*-wh-*op*) below. This together with (*wh* focus) is what we see as the core generalizations regarding E*wh*Q structures.

(*non*-wh-*op*) E*wh*Es are syntactically not *wh*-operators.

Before we move on, a brief comment on the role of intonation for E*wh*Qs. We do not consider the salient rise contour (L*H-H% [= /]) as a constitutive E*wh*Q form feature: For one thing, rise is not obligatory for all types of E*wh*Qs, cf. in particular so-called 'reference' E*wh*Qs like (14) that always come with a fall contour (see Bartels 1999: §6.4, Truckenbrodt 2012a: §3.7)). Hence, final rise, while typical in terms of frequency, is no constitutive E*wh*Q feature.[4]

(14) a. [A: Fred didn't want to abandon it. – B:] Fred didn't want to abandon WHAT? (\)
b. [A: Did they finish their plates? – B:] Did WHO finish their plates? (\)
c. [Was heißt hier, sie haben ihn.] Sie haben WEN? (\)
[what means here, they have him.] they have WHO
['What do you mean, they have him.] They have WHO?' (\)
(examples a,b from Bartels 1999: 212, c from Pasch 1991: 195n.3)

What is more, we will see that the *wh*-question meaning and the echo effect of all E*wh*Qs are derivable without appeal to the (meaning of the) final rise contour. This confirms that final rise is no constitutive E*wh*Q feature; its presence (or absence) must be due to interacting factors. This conclusion is supported by the results of the major studies of intonational meanings in the last decades (for an overview, see Truckenbrodt 2012a): They have shown that both fall and rise contours occur in declaratives as well as in all types of interrogatives (including regular *Wh*Qs as well as E*wh*Qs) – which rules out their being *directly* related to sentence mood, in particular questionhood –, and have suggested meanings for these contours by which their entire distribution across clause types is plausibly covered (see in particular Bartels' (1999) proposal and its elaboration in Truckenbrodt (2012a) that [\] vs. [/] signals assertion vs. non-assertion of a related salient proposition). In other words, the typical rise intonation in E*wh*Qs is independently accounted for, hence of no systematic relevance for the E*wh*Q analysis (though still a helpful clue for identifying E*wh*Qs).[5]

[4] In the previous literature, reference questions have often been denied true E*wh*Q status but as demonstrated by Poschmann (2015: 218-220) there is no good independent reason for this (cf. also Truckenbrodt (2012a: §3.7)).
[5] Much the same is true for the 'exaggerated' rise that is typical of E*wh*Qs (as already observed by Bolinger (1987), Oppenrieder (1988)) but again not obligatory. Moreover, variations in height seem to have expressive rather than grammatical reasons (see Oppenrieder 1988: 190, Repp & Rosin 2015), in the case of E*wh*Qs the varying strength of motives (auditory failure, surprise, incredulity) for asking them. In other words, this peculiar 'echo intonation' can be accounted for independently of the constitutive E*wh*Q features as well.

To sum up section 2.1, we take the properties (wh *focus*) and (*non*-wh-*op*) to be the core formal properties of E*wh*Qs.

(wh *focus*) E*wh*Es bear obligatory main stress/narrow focus on their *wh*-part.
(*non*-wh-*op*) E*wh*Es are syntactically not *wh*-operators.

2.2. Discourse properties of E*wh*Qs

Let us next look at the pragmatics of E*wh*Qs more closely. Regarding E*wh*Q uses, reactive uses as in dialogue examples like (2) are the typical case: E*wh*Qs echo a previous utterance, the 'echoed utterance' [EU]. In what follows we clarify the exact nature of the discourse relation between EU and E*wh*Q. For ease of exposition we concentrate on the default type of E*wh*Qs: E*wh*Qs with declarative structure. E*wh*Qs with non-declarative structure as well as potentially 'initiative E*wh*Qs' will be integrated into the picture in due course.

Observe first that EU and E*wh*Q obey an adjacency condition: The E*wh*Q relates to an utterance in the immediate context. This is illustrated in (15) vs. (2a). We will refer to this as (*adjacency*).

(15) a. A: Tom invited our president for dinner tomorrow night.
b. B: A dinner invitation – usually Tom is so stingy! # (But) Tom invited WHO? (/)

(*adjacency*) E*wh*Qs always echo the *immediately preceding* utterance.

This indicates a particular anaphoric relationship – one that is familiar from focus. (15a') vs. (15'b) illustrates (with a contrast focus) that focus cannot pick up on an utterance that lies way back in the discourse (a property of focus that needs to be investigated further from a semantic perspective, though that is not something we can do here). Note that other discourse relations (for example presupposition) do not have to obey (*adjacency*) (for example the presupposition of the definite article could be satisfied several propositions away from its occurrence). Thus we propose (*adjacency*) in analogy to focus behaviour.

(15') a. A: Tom invited our president for dinner tomorrow night.
B: (No –) Tom invited our CHANcellor for dinner.
b. A: Tom invited our president for dinner tomorrow night.
B: A dinner invitation – usually Tom is so stingy! # (But) Tom invited our CHANcellor for dinner.

Let us next clarify the linguistic nature of the EU-E*wh*Q relation. According to the majority position in the literature (for details see section 3.2) this relation is essentially 'quotative': E*wh*Qs 'quote' the EU in a questioning attitude. This position comes in a liberal version allowing for literal and nonliteral quotes or mixtures thereof, and a 'strictly quotative' (or 'metalinguistic') one allowing for literal quotes only (cf. also notes 12,13 below), thus claiming that

(i) E*wh*Q structure is essentially (a copy of) EU structure,
(ii) the copied E*wh*Q structure is opaque, *i.e.* there is no grammatical interaction with E*wh*E insertion (which is thereby taken to be a superficial replacement process).

Both of these claims are untenable:

The central evidence against (i) are the many cases of *content echoes,* that is E*wh*Qs that take up some element of EU content but in different linguistic form, cf. (16a-d). In extreme cases like (16d) EU and E*wh*Q have no lexical or syntactic feature in common, the content link being provided exclusively by background knowledge. So, siding with the liberal quotative view in this respect, we reject (i) in favor of positing (*content*). ((*content*) is a necessary condition on all E*wh*Qs but a sufficient one only for declarative E*wh*Qs. We return to this split in E*wh*Q behavior below.)

(16) a. EU: Call the pope immediately!
E*wh*Q: I'm supposed to call WHO? (/)
b. EU: Could Paul be schizophrenic after all?
E*wh*Q: You think Paul is WHAT? (/)
c. EU: If only my son were an ADHS kid!
E*wh*Q: You want your son to be WHAT? (/)
d. EU: Who would have thought that our son would do so well at MIT?!
E*wh*Q: Tom is now studying WHERE? (/)

(*content*) E*wh*Qs are related to their EUs by way of content.

The property (*content*) has an important implication: When analyzing E*wh*Q structure, reference to the respective EU structure is of no use (a point reinforced by 'non-reactive E*wh*Qs', see below). E*wh*Qs are not hybrids but regular autonomous grammatical structures just like *Wh*Qs.

Given this result, we may expect that (ii) is also untenable. If we exclude, correctly we think, 'extra-communicative' E*wh*Q uses,[6] this is clearly borne out: Rather than taking over the grammar of the questioned EU items, *wh*-words functioning as E*wh*Es impose their usual lexical restrictions on their sentence context, which means they interact with the base structure, in keeping with the grammar of the respective language. Thus, *wh*-words are as a rule minimal XPs, hence there are no E*wh*Qs where the E*wh*E stands for non-XPs, cf. (17a). Likewise, *wh*-words are singular and have a specific semantics, which rules out E*wh*Qs like (17b), and being pronouns, they cannot readily occupy extraposition slots nor appear right-dislocated as their EU counterparts do, cf. (17c,d,e).

(17) a. [A: He tattoos boas. – B:] *He WHAT boas? / *WHAT boas? / √He (tattoos) WHAT?

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[6]These are either E*wh*Qs urgently requesting remedy of communicative breakdown (as in the case of severe auditory or linguistic failure of the EU) or E*wh*Qs in primary imitation use (be it that the speaker wants to signal precisely how much of the EU he has understood or that he uses imitation as a mocking device). In these cases, E*wh*Q structures violating the usual restrictions are possible, cf. (i) with its ungrammatical English base structure, and (iia,b) in contrast to (17a) and (18b) above.

(i) [A: Kit not understants my chokes. – B:] WHO not unterstants your chokes? (/) / He not understants WHAT? (/)
(grammatical version of A's utterance: The kid doesn't understand my jokes.)

(ii) a. [A: ~~He tattoos~~ boas. – B:] WHAT boas? (/) [~~XXX~~ = incomprehensible]
b. [A: Who does he think ~~that Tom loves~~? – B:] Who does he think WHAT? (/)

Both these uses are clearly 'extra-communicative', so it should not be surprising if their extra-grammatical results were 'extra-grammatically' licensed as well. Since the discourse relation is necessarily strictly quotative in these cases one might speculate that they are licensed by being locally identifiable via the strictly quotative relation to the EU. Note that ungrammaticality due to mock imitation also occurs outside E*wh*Qs, see (iii), and is licensed by presumably the same mechanism as the 'deviant' E*wh*Qs in question.

(iii) "K. said/.../: 'We telling what we are knowing.'/.../'And what are you knowing?' I asked. [I = detective, a native speaker]." (S. Paretsky. 2011. *Body Work.* London: Hodder, p.290.)

If so, these E*wh*Qs can be set aside here. As a consequence, in checking grammatical properties of E*wh*Qs we concentrate on E*wh*Qs motivated by surprise or incredulity, thus ensuring their normal 'communicative' use.

b. [A: The Gringos are angry. – B:] WHO *are/√is angry? / *WHAT/√WHO is angry?
c. [A: He'll say in a few weeks that she has to go. – B:] ??He'll say in a few weeks WHAT? / √He'll say WHAT in a few weeks?
d. [A: Er wird sagen, dass sie gehen muss.]
[he will say that she go must]
['He'll say that she has to go.']
B: * Er wird sagen WAS? / √Er wird WAS sagen?
he will say WHAT he will WHAT say
'He'll say WHAT?'
e. [A: She left, our wee lass. – B:] *She left (,) WHO? / √ WHO left? (/)

Especially interesting evidence against (ii) are patterns like (18): While the CP slot in (18a) is a licit insertion site for *what*, the CP slot in (18b) is not, presumably because it contains a trace. This immediately rules out (ii) for if (ii) were correct, this difference between (18a) and (18b) should not matter. It also provides particularly clear evidence against (i): Apparently, *wh*-words functioning as E*wh*Es enter E*wh*Q structures on the same ('deep') level as *wh*-words enter regular *Wh*Q structures, and are subject to the same grammatical regularities; hence E*wh*Qs like (18b), where ex-situ who_i has no t_i counterpart, can never arise.

(18) a. [A: He thinks that Tom loves Sue. – B:] He thinks WHAT? (/)
b. [A: Who_i does he think that Tom loves t_i? – B:] *Who_i does he think WHAT? (/)

In sum, E*wh*Q formation does not refer to EU structure, as the strictly quotative approach, see (i)-(ii), would have it; it is as autonomous as *Wh*Q formation is.

However, as pointed out in section 2.1 and illustrated by the examples in (11)-(12) with *wh*-interrogative base structure, E*wh*Es do *not* interact with the exponents of clause type features of the respective E*wh*Q structures. Given the otherwise considerable interaction illustrated in (17)-(18), a strictly quotative analysis handling that is no option. An alternative proposed by Sobin (2010) is assuming opaqueness of just the **'**CP-part**'** of E*wh*Q structure which houses the clause type features, by 'Comp-Freezing' (see Sobin 2010: 142).[7] But apart from being a mere stipulation, this proposal is in conflict with data like (19) where E*wh*Es arguably appear within this CP-part.

(19) a. [Which books about WHAT] sell like mad? (/)
b. He is the guy [whose pictures of WHO] are famous? (/)

We will argue instead, see section 2.3 below, that it is the absence of a clausal question operator *Q*, and the corresponding non-operator status of E*wh*Es, that explains their insensitivity to clause type features. This gets us a non-stipulative account of the deviations from regular *wh*-behavior, which other approaches (for example Sobin 2010) cover by further stipulations, if at all.

In sum, we posit (*auto*).

(*auto*) E*wh*Qs are regular and fully transparent grammatical structures.

[7] Sobin leaves the term 'CP-part' undefined but clearly likens it to the structure formerly making up 'Comp' (*i.e.*, in CP terms, the structure headed by SpecC and C^0) which for him is the locus of all clause type features. While this may be controversial (also due to more refined conceptions of CP, cf. the discussion in Portner & Zanuttini (2003: 42-46)), this does not matter here since our solution implies non-interaction with clause-type features irrespective of their location.

We are now ready to answer the central question: What is the discourse relation between EU and E*wh*Q, *i.e.* what constrains the possible EU-E*wh*Q pairs that may appear in discourse? In our view, given (*content*) and (*auto*), there is but one possible direction for the answer: The discourse use condition on E*wh*Qs is projected by their *formal* properties such that every E*wh*Q specifies, by virtue of the interpretive effects of these properties, the class of utterances it can felicitously 'echo-question' in discourse. This entails that what determines the possible EU-E*wh*Q pairs is the E*wh*Q.

This conclusion is the exact opposite of the popular quotative view, which always takes the EU as the determining factor (e.g. Poschmann (2015), see section 3.2 for detailed references), but it is supported by further evidence.

To see this, let us widen our empirical perspective and look at non-reactive E*wh*Qs and non-declarative E*wh*Qs.

*Non-reactive E*wh*Qs* are clauses in E*wh*Q form that exhibit an echo effect in the absence of an EU. Their existence confirms the conclusion just reached, *and* at the same time our form-related conception of the echo property from section 1, here repeated as (*echo*).

(*echo*) Clauses in E*wh*Q form convey the impression that the *wh*-expression marks a gap the discourse participants know has been closed before.

The following data are examples of non-reactive E*wh*Qs. First, there are occurrences out of context such as the titles of Janda (1985) or Bobaljik & Wurmbrand (2015) in (20a,b), which clearly direct us to infer an utterance the respective clause in E*wh*Q form could be an echo *wh*-question to, or the situation of joining a dialogue just when a clause in E*wh*Q form is uttered, as in (21). It follows that the echo effect *must* depend on E*wh*Q form thus supporting (*echo*) as well as the E*wh*Q as determining factor of possible EU-E*wh*Q pairs.

(20) a. Echo questions are evidence for what?
b. Questions with declarative syntax tell us what about selection?

(21) [Upon entering C hears B[ob] saying (a) to A and joins in with (b) or (b'):]
a. B: John did WHAT? (/)
b. C: Oh Bob, why don't you use your hearing aid?
b'. C: Don't tell me John did something surprising for once.

Second, there are properly 'initiative' questions in E*wh*Q form (*i.e.* subject to (wh *focus*) and (wh *non-op*)) that typically occur in special questioning situations: quiz questions, rehearsing questions (*e.g.* in the classroom), courtroom interrogations, 'make sure' questions, interview questions, cf. (22a-e). What the contexts for these questions have in common is the fact that – in contrast to 'normal' *wh*-questions with insecure answer expectations – the speakers and/or hearers of quiz questions, courtroom interrogations, etc. are *obliged to know*, or are at least *subject to justifiably strong hearer/speaker expectations to know*, the answer to the question.[8] But this is just the echo effect projected, which underlines that this effect goes hand in hand with the specific E*wh*Q form.

[8] As already discussed in Reis (1992: 257-258; 2012: 9), and also stressed by an anonymous reviewer, 'initiative' E*wh*Qs may vary as to which discourse participant is more strongly obliged/expected to know the answer (although both are subject to much stronger obligations/expectations than with normal *wh*-questions). Thus, in (22a,b) speaker knowledge seems to be prominent, in (22d,e) hearer knowledge. Either variant is compatible with the echo effect (note that there are comparable knowledge asymmetries in reactive E*wh*Qs depending on their being motivated by incredulity vs. understanding failure).

Thus, 'initiative E*wh*Qs' can be claimed as additional evidence for the results derived above.[9]

(22) a. Caesar defeated Pompey WHERE? (/)
b. Once more: In case of fire alarm you do WHAT, kids? (/)
c. And then you saw the accused talk to WHO? (/)
d. Just to make sure, you need the report exactly WHEN? (/)
e. Und das ist Ihr WIEvieltes Länderspiel, Herr Klose? (/)
and this is your HOW many-eth national game, Mr. Klose
'And you have played for the national team HOW many times, Mr. Klose?'

*Non-declarative E*wh*Qs* allow us to refine the view of the relation between EU and E*wh*Q. As stated in terms of the property (*content*), the primary feature defining possible EUs is shared content (no matter whether expressed or inferrable) with the E*wh*Q. Thus, to give an example, the class of possible EUs for the E*wh*Q (16d): *Tom is now studying WHERE?* comprises any EU no matter in what linguistic form from which the proposition 'that Tom is studying $[_{\text{Loc}}\ \Delta]$' can be inferred in context, including of course also the 'strictly quotative' EUs like *Tom is now studying at MIT*. For declarative E*wh*Qs with regular *wh*-insertion sites no more need be said – their discourse potential is defined solely by their propositional content as just illustrated. But all other cases are subject to an additional *formal* condition: Non-declarative E*wh*Qs require EUs with formally identical clause type features. E*wh*Qs with deviant *wh*-insertion sites – be it into irregular category slots as exemplified in (6) or *wh*-insertion below the word level as in (23d,e) (see Janda 1985, Artstein 2002a: ch.5) – require EUs with formally identical insertion frames, cf. (23a-e), although otherwise the relation is more or less just one of content.

(23) a. E*wh*Q: Did Mary meet WHO? (/)
possible EU to (a) e.g.: √Did Mary meet Putin?
impossible EUs to (a) e.g.: #Do you know whether Mary met Putin?
#I wonder whether Mary met Putin.
b. E*wh*Q: Everybody go WHERE? (/)
possible EU to (b) e.g.: √Everybody go to the shed!
impossible EUs to (b) e.g: #Could everybody please go to the shed!
#I want everybody to go to the shed.
c. E*wh*Q: The WHO is in town? (/)
possible EU to (c) e.g.: √The US president is in town.
impossible EUs to (c) e.g.: #Obama is in town.
#Michelle's husband is in town. / ...
d. E*wh*Q: They were at a WHAT-festivity? (/)

[9] There are also 'information-seeking' *wh*-in-situ questions like (i) (from Ginzburg & Sag 2000: 280-281), which according to Ginzburg & Sag (2000) have to be kept strictly apart from E*wh*Qs (which they restrict to "reprise" = reactive uses):

(i) A: I am going to buy a house. – B: And you are going to pay for it with WHAT? (/)

However, as shown by Poschmann (2015: §§6.2.2-6.2.4), they can never be asked out of the blue but presuppose that the question proposition corresponds to a salient context proposition, the Givennness presupposition "DeakzentF" (cf. *ibid.*: 131), which looks very much like a variant of the echo effect. (The same is true for *wh*-in-situ questions in French; cf. Obenauer (1994) and the update of his analysis in information structural terms in Hamlaoui (2010), (2011)). Moreover, *pace* some smaller differences still to be explored (see Reis 2016: §6.1), these *wh*-in-situ questions essentially share the form properties of *bona fide* E*wh*Qs plus their syntax as outlined in section 2.3, so considering cases like (i) as a (contextually conditioned: weaker) type of E*wh*Qs has considerable plausibility.

possible EU to (d) e.g.: √ When Tim and Sue went to a stag festivity, ..
impossible EUs to (d) e.g.: #They were at a stag party.

e. E*wh*Q: He has ornithoWHAT? (/)
possible EUs to (e): e.g.: √ He has ornithophobia.
impossible EUs to (e) e.g.: #He has a fear of birds.

To date, this distinction in discourse potential between E*wh*Q form classes has rarely been noted let alone been properly investigated. However, since the constitutive grammatical E*wh*E properties are essentially the same it is arguable that both can be covered by essentially the same analysis, with the dividing discourse property, *i.e.* the formal identity condition, conceivably accounted for by independent mechanisms.[10] In any case, the facts illustrated by (23) are additional evidence in favor of our view of the relation between EU and E*wh*Q: It is the E*wh*Q, by way of its non-declarative CP form (and/or deviant E*wh*E insertion site), that requires the CP form (and/or insertion frame) of possible EUs to be the same but not the other way around, see (23) vs. (16a-d) above.

To sum up section 2.2, we have shown that E*wh*Qs are structures having the (*auto*) property,

(*auto*) E*wh*Qs are regular and fully transparent grammatical structures.

which project, by virtue of their form, a use potential defining the class of possible EUs in discourse on the one hand, and the echo effect in isolated (and initiative) cases on the other, thus showing both to be two sides of the same coin. Our task is to *derive* this use potential/the echo effect and the properties (*adjacency*) and (*content*) below from the E*wh*Q form.

(*adjacency*) E*wh*Qs always echo the *immediately preceding* utterance.
(*content*) E*wh*Qs are related to their EUs by way of content.
(*echo*) Clauses in E*wh*Q form convey the impression that the *wh*-expression marks a gap the discourse participants know has been closed before.

2.3. E*wh*Qs do not have clausal Q

As we have seen in sections 2.1/2.2, E*wh*Qs and *Wh*Qs are conspicuously different in overt form and discourse behavior. Still, they share the *wh*-question meaning, and since this is commonly derived from the interaction of the w*h*-phrase with a covert interrogative complementizer, "clausal *Q*" for short, the default assumption might be that *Q* is present in E*wh*Qs as well, hence that E*wh*Qs are true *wh*-interrogatives. In the following we argue that they are not. To this effect we examine the three types of effects by which the presence of *Q* can be diagnosed in German and English,

- *Q1*: *Q* attracts one (and only one) *wh*-phrase into clause-initial position
- *Q2*: *Q* determines scope for the *wh*-phrases it c-commands, scope-binding being subject to certain constraints (island constraints, intervention constraints, etc.)
- *Q3*: *Q* types the clause it introduces as syntactically and semantically interrogative,

and show that neither of these effects can be observed with E*wh*Qs.

[10] As far as we can see, this strictly quotative condition on the discourse relation is the only distinctive feature of these E*wh*Qs (the only other conspicuous difference – there are no initiative analogues – is a mere reflex of this condition). If so, it is tempting to appeal to the explanation for strict quotativity suggested in note 6 for certain E*wh*Qs in extra-communicative use (which would, however, imply that E*wh*Qs with non-declarative structure or non-regular *wh*-insertion sites are somewhat 'extra-grammatical' themselves). See also section 5.2 below.

Re Q1, it suffices to refer to the form properties discussed in section 2.1: E*wh*Es are not *wh*-moved. This fact is immediately and most naturally explained if there is no *Q* to attract a *wh*-phrase to begin with.

Re Q2, we find that E*wh*Qs, unlike *Wh*Qs, are insensitive to island or intervention configurations, cf. (24)-(25).[11] (For formal discussion of E*wh*Q intervention behavior, see section 5.1.)

(24) a. *Wh*Q: *Where does BILL buy [the wine and what]? (\)
E*wh*Q: Where does Bill buy [the wine and WHAT]? (/)
b. *Wh*Q: *Who does LAUra hate, [since he flunked out where]? (\)
E*wh*Q: Who does Laura hate, [since he flunked out WHERE]? (/)

(25) *Wh*Q: *Welches Buch hat NIEmals welche Frau gelesen? (\)
which book has never which woman read
intended: 'Which book did which woman never read?'
E*wh*Q: Welches/WELches Buch hat niemals WELche Frau gelesen? (/)
which/WHICH book has never WHICH woman read
'Which book did WHICH woman never read?'

The obvious explanation is again that there is no clausal *Q* in E*wh*Qs for without *Q* there is no scope binding relation by which the respective constraints could be violated.

But this also means that E*wh*Es do not behave like *wh*-quantifiers – there are no *wh*-quantifiers without (clausal) scope. And this behavior is systematic, cf. (26): While multiple *Wh*Qs allow the 'pair list' reading which presupposes a quantifier-variable relation (26a), multiple E*wh*Qs allow only the 'single pair' reading, thus again behaving like non-operators rather than quantifiers (which also signals the absence of *Q* in (26b)).

(26) a. Who bought what yesterday? (\)
Possible answers:
a1. Paul bought a picture, Tom a lamp, Tina a clock.
a2. Our grandma a Rolls Royce.
b. WHO bought WHAT yesterday? (/)
Possible answers: *(a1), √(a2).

At first glance, the so-called 'root scope' property from section 2.1 is at odds with this picture. But note that handling it by assuming *Q* in E*wh*Qs will not do, for *Q* would be present in root and complement structure alike with E*wh*E 'outscoping' both, see (27). Hence it would have to be made inoperative in both cases, and a specific Q_E complementizer occurring only in root position and binding only E*wh*Es, would have to be installed. Both these stipulations are avoided by our analysis, which derives root scope behavior by way of a phrasal *Q* operator (see section 4 below).

(27) a. It is obvious who lived WHERE? (/) [= (7b)]
b. Who knows who lived WHERE? (/)

[11] Note that replacing the *wh*-phrases in (24) by D-linked *which*-phrases would not change the grammaticality ratings of *Wh*Qs vs. E*wh*Qs. This shows, just like (25), that E*wh*E behavior is not just D-linked behavior (as implied in Sobin (1990), (2010)): While D-linked phrases are insensitive to some constraints (in particular superiority), but not to others (for example the coordinate structure constraint and the adverbial island constraint exemplified in (24)-(25)) E*wh*Es are immune to these constraints *in toto*.

In short, there is no scope evidence for assuming *Q* in E*wh*Qs.

Re Q3: In its function as a clause-typing feature *Q* should manifest itself in a) E*wh*Qs sharing the clausal distribution of *wh*-interrogatives, b) allowing and disallowing the same clause-type sensitive items. But neither (a) nor (b) are borne out.

(a) is refuted by the observation in section 2.1 that E*wh*Qs cannot figure as *wh*-complements, that is they cannot be embedded. The property (*non*-wh-*op*) tells us why: Being non-operators, E*wh*Es cannot fill the initial *wh*-operator position as required.

(b) is refuted by the facts illustrated in (28)-(29). (28) shows that elements primed for interrogative environments, for example NPIs like English *ever*/German *jemals* or the German modal particle [=MP] *denn,* occur in *Wh*Qs as expected, cf. (28), but do not in their E*wh*Q counterparts, cf. (28') (including initiative E*wh*Qs, see (28'c)). This argues against a shared complementizer *Q*. In addition, (29) illustrates that clause type sensitive elements – our examples being German modal particles and adverbs that are sensitive to ±declarative, ±interrogative and ±imperative environments – *always* correlate with the E*wh*Q base structure type; in fact there is not a single lexical item correlating 1:1 with E*wh*Qs. Thus positing an E*wh*Q-specific Q_E complementizer (as done in Sobin (2010) or Truckenbrodt (2013)) instead of *Q* has no support either.

(28) a. Wer hätte hier *jemals* Helium vermutet?
who have$_{Subj}$ here ever helium suspected
Who would *ever* have expected helium here?

b. Warum ist er *denn* HIER?
Why is he denn$_{MP}$ here
'Why is he here?'

c. [A: Sue ist in Rom. – B:] Und was MACHT sie *denn* da?
[A: Sue is in Rome. – B:] and what makes she denn$_{MP}$ there
[A: Sue is in Rome. – B:] 'And what is she doing there?'

(28') a. *Der WER hätte hier *jemals* Helium vermutet?
the who have$_{Subj}$ here ever helium suspected
*The WHO would *ever* have expected helium here? (/)

b. * Er ist *denn* WARum hier? (/)
he is denn$_{MP}$ WHY here
intended: 'He is here WHY?'

c. [A: Sue ist in Rom. – B:] * Und da macht sie *denn* WAS? (/)
[A: Sue is in Rome. – B:] and there makes she denn$_{MP}$ WHAT
[A: Sue is in Rome. – B:] 'And she is doing there WHAT?'

(29) a. Declarative: A: Karl hat ja / leider / *denn Haikus geschrieben.
Karl has ja$_{MP}$ / unfortunately / *denn$_{MP}$ haikus written
'Karl wrote haikus.'

E*wh*Q: B: Karl hat ja / leider / *denn WAS geschrieben? (/)
Karl has ja$_{MP}$ / unfortunately / *denn$_{MP}$ WHAT written
'Karl wrote WHAT?'

b. *y/n*-Interrogative: A: Hat Karl *ja / *leider / denn Haikus geschrieben?
has Karl *ja$_{MP}$ / *unfortunately / denn$_{MP}$ haikus written

'Did Karl write haikus?'

E*wh*Q: B: Hat Karl *ja / *leider / denn WAS geschrieben? (/)
has Karl *ja$_{MP}$ / *unfortunately / denn$_{MP}$ WHAT written
'Did Karl write WHAT?'

c. Imperative: A: Geh ruhig / halt / *ja / *denn nach Berlin!
Go ruhig$_{MP}$ / halt$_{MP}$ / *ja$_{MP}$ / *denn$_{MP}$ to Berlin
'Go to Berlin!'

E*wh*Q: B: Geh ruhig / halt / *ja / *denn WOhin? (/)
go ruhig$_{MP}$ / halt$_{MP}$ / *ja$_{MP}$ / *denn$_{MP}$ WHERE-to
'Go WHERE?'

Summing up section 2.3, adopting a clausal *Q* for E*wh*Qs has no support whatever, so (*Q*) holds:

(*Q*) E*wh*Qs do not have a clausal *Q* operator.

In addition, the idea that E*wh*Es are not *wh*-operators has been confirmed. The formal ingredients *Wh*Qs provide for the derivation of the *wh*-question meaning are not similarly available in E*wh*Qs. As a consequence, we have to look for a different, necessarily non-standard way for its derivation.

2.4. Interim summary

Let us briefly recapitulate what we have got so far. We have concluded that E*wh*Qs are autonomous syntactic structures, cf. (*auto*). This means that their formal properties, summarized by (wh *focus*), (*non*-wh-*op*) and (*Q*), should be the basis for deriving their *wh*-question meaning and the echo effect as formulated in (*echo*). (*non*-wh-*op*) and (*Q*) imply that there has to be a decidedly non-standard element to the phenomena to be accounted for. The main property the compositional analysis can be based on is (wh *focus*), the specific E*wh*Q information structure manifesting itself in the obligatory *wh*-part focusing of the E*wh*E.

We will show in the following that there is virtue to necessity: the non-operator status of E*wh*Es, the echo effect (including its (*adjacency*) and (*content*) properties), and the E*wh*Q question meaning can be successfully handled on this basis.

(*auto*)	E*wh*Qs are regular and fully transparent grammatical structures.
(wh *focus*)	E*wh*Es bear obligatory main stress/narrow focus on their *wh*-part.
(*non*-wh-*op*)	E*wh*Es are syntactically not *wh*-operators.
(*Q*)	E*wh*Qs do not have a clausal Q operator.
(*adjacency*)	E*wh*Qs always echo the *immediately preceding* utterance.
(*content*)	E*wh*Qs are related to their EUs by way of content.
(*echo*)	Clauses in E*wh*Q form convey the impression that the *wh*-expression marks a gap the discourse participants know has been closed before.

3. Positioning our approach

3.1. A preview of our analysis

Here is a sketch of the analysis we propose in section 4: The grammar generates E*wh*Q structures that contain a *wh*-phrase with a narrow focus on *wh*. The E*wh*Q structure does not contain a clausal *Q* operator. But for the *wh*-phrase to be interpretable, there has to be a *Q* operator, and in the case of E*wh*Qs, it is a phrasal *Q* (the presence of which can be related to *wh*-focus): the operator attaches to the E*wh*E. What makes an ordinary *wh*-phrase syntactically an operator is thus absent in E*wh*Es, deriving their non-operator status. At the same time, phrasal *Q* allows us to derive the question semantics of E*wh*Qs.

The narrow focus on *wh* is also responsible for the special pragmatics of E*wh*Qs, i.e. the echo effect. Focus marking does what it always does, it triggers the introduction of alternatives into the calculation. In the case of narrow focus on *wh*, there is – unusually – one particular alternative, namely the deictic or anaphoric alternative to the *wh*-element (the linguistic expression of which can be represented by a demonstrative pronoun, e.g. *where* - *there*). Focus, as always, requires a (adjacent) discourse antecedent. Thus the deictic/anaphoric alternative has to be available in the context. This presupposition of focus derives the echo effect.

The details of this analysis are worked out in section 4. Before we present it, we briefly position our analysis relative to previous proposals on the grammar and interpretation of E*wh*Qs.

3.2. E*wh*Qs in the literature

As we see it, previous accounts differ from ours mainly in their conceptions of a) the 'echo effect', b) the E*wh*Q-specific focus structure – differences that we consider jointly responsible for the constructional features of these accounts we want to avoid.

Let us begin with the *echo effect*. For previous approaches this effect is essentially a discourse effect: E*wh*Qs are 'echo' questions by virtue of echoing = quoting (parts of) the preceding utterance. Hence EwhQs are reactive by definition, and the 'echo effect' is the quotative byproduct of discourse position, which is usually represented as a quotative component of the E*wh*Q question proposition spelling out the locutionary or the illocutionary act performed by the EU (cf. *i.a.* Jacobs (1991), Ginzburg/Sag (2000), Fiengo (2007), and the 'metarepresentative'[12] analyses by Noh (1998), Iwata (2003), Poschmann (2015)). This is illustrated in (30a,b), in which the meanings of the E*wh*Qs (1a,b) as used in (2a,b) are paraphrased accordingly.

(30) a. Who *did you say/assert* that Tom invited? (/)
b. Where *did you ask* that Jane will go? (/)

Concerning the derivation of the echo effect so conceived, there have been formal attempts like Escandell-Vidal's (2002) where echo questions are argued to be "metarepresentations by virtue of their very syntactic structure" (2002: 871). But her syntactic structures are clearly ad hoc; what is more, Iwata (2003) and especially Poschmann (2015: §6.3) have convincingly shown that the

[12] If we take thoughts and utterances as mental and linguistic representations, then an utterance that refers "to thoughts or utterances of others /…/ in form of citations or some other form of reported speech" is 'metarepresentative' (Poschmann 2015: 60). Expressly metarepresentative studies place theselves in the relevance theoretic tradition (the first E(*wh*)Q study in this vein being Blakemore (1993)) but since the metarepresentative quality of E*wh*Qs amounts to their containing a quotative component, they can be safely subsumed under 'quotative' approaches in general. – Strictly quotative are 'metalinguistic' approaches, by which the echo *wh*-expression targets a linguistic expression in the EU rather than its propositional counterpart (for a critique of the most sophisticated variant of this approach – Sudo (2006), (2011) – see Poschmann (2015: 205-208)).

quotative component comes about in pragmatics. As for the remainder of the echoic question proposition, no derivation is needed to begin with in quotative approaches since its echoing quality is already built into the reactive definition of E*wh*Qs.

We are skeptical about this quotative conception of the echo effect: First, it promotes misunderstandings of E*wh*Q form as discourse-based, which is at odds with (*auto*), and often enough also with (*content*).[13] Second, given its pragmatic status it implies that the echo effect is independent from E*wh*Q form. Hence this form should be explained in echo-independent ways – but so far no convincing explanation has been forthcoming.[14] Third, as shown in section 2.2, there is positive evidence for a form-related echo effect like (*echo*).

These points, we think, justify pursuing our form-based conception of the echo effect. This is not to deny the existence of a quotative component in reactive E*wh*Qs. Rather, since whatever E*wh*Q form elements trigger the echo effect in our sense will also be present in reactive constellations, we presume that this effect will expand to the quotative meaning component in the requisite contexts.

Let us finally point out that the different conceptions of the echo effect are not just that but delimit our object of enquiry in different ways. Defining E*wh*Qs by the quotative component, a mere pragmatic effect, forces inclusion of *wh*-questions having this component though lacking the E*wh*Q-specific form. Likewise, defining them by their E*wh*Q-specific form (with the echo effect claimed to arise from that form) as we do, forces inclusion of *wh*-questions having this form but being non-reactive, *i.e.* non-quotative. Such atypical cases exist for either approach, cf. German V-final *wh*-questions 'quoting' *Wh*Qs as in (31) for the former (claimed to be E*wh*Qs by Poschmann (2015: 8, 195-196)), and 'initiative' questions in E*wh*Q form as presented in section 2.2/(22) for the latter.

(31) [A: Wann geht dein Zug? (\) – B:] Wann mein Zug geht? (/) [In 10 Minuten.]
when goes your train when my train goes [in 10 minutes]
'When does your train leave? – [You ask] when my train leaves? [In 10 minutes.]'

Neither definition is of course intrinsically better or worse than the other. But what can be better or worse is the form-function fit of the class of E*wh*Qs these definitions lead to. The quotative definition yields next to no formal overlap between typical and atypical echo *wh*-cases like (31), so there is no form-function fit for the resulting class of E*wh*Qs to speak of.[15] As for our formal definition, we argued in section 2.2 that the atypical 'initiative' cases are interpretively similar enough to the typical ones to yield a reasonable form-function fit for the class of E*wh*Qs so defined, thus making our form-oriented approach the more attractive option to pursue.

[13] In the extreme case E*wh*Q structure = EU structure with the *wh*-expression freely plugged in, cf. Cooper (1983: 148-150), for whom E*wh*Qs are extragrammatical phenomena, or the squarely EU-based syntactic analysis in Wunderlich (1986), or Horn's metalinguistic proposal (1989: 381). But loose talk (cf. Sobin's positing a "discourse strategy called *Comp Freezing*" or "a (possibly loose) copy of the EU" as part of E*wh*Q structure (2010: 142, 144/(43)) is common, and even if not meant literally, leads to misconceptions of many issues concerning the relation of E*wh*Qs to possible EUs (see also section 2.2 above). The only one in the quotative camp stating explicitly that E*wh*Qs are autonomous grammatical structures seems to be Poschmann (2015: 94).

[14] The only serious attempt we know of is again Poschmann's (2015: ch.6), who tries to reduce the idiosyncrasies of E*wh*Qs to regular properties of in-situ *wh*-questions, taking those in *wh*-in-situ languages as the paradigm case. But German and English questions in E*wh*Q form a) cannot be embedded (see also Bobaljik/Wurmbrand (2015)), b) induce a Givenness presupposition (see note 9 above), and the *wh*-expressions they contain c) behave as non-operators, with d) stress/focus pertaining only to the *wh*-part rather than to the *wh*-expression as a whole (see also the discussion of (wh *focus*) right below). Neither of these properties holds for *wh*-questions in *wh*-in-situ languages, which rules out equating them with E*wh*Qs.

[15] *Wh*-questions like (31) have rise intonation, a typical E*wh*Q form feature, but they share none of the constitutive ones, which are (wh-*focus*), (wh *non-op*) (see section 2.1). Cf. Reis (2013: 108-110) for further discussion.

Turning now to the issue of *E*wh*Q focus structure*, its relevance is best appreciated when looking at the core problem of E*wh*Q-analysis: E*wh*Qs and *Wh*Qs share the *wh*-question meaning, so the different behavior of *wh*-expressions in E*wh*Qs outlined in section 2.1, poses two challenges in one: We must account for the differences in E*wh*Q vs. *Wh*Q form within the same grammar, *and* derive the shared *wh*-question meaning of E*wh*Qs despite these differences.

So far, no analysis has handled this problem without severe stipulations, cf. in particular (i) the use of E*wh*Q-specific clause typing elements/complementizers with the differences to *Wh*Qs built-in (see especially Sobin 1990, 2010), (ii) the set-up of a separate echo *wh*-expression class with properties defining them more or less directly as non-operators (see Comorovski (1996), Poschmann (2015: §6.1), or Sobin (*ibid.*), who sets them apart by E*wh*Q-specific scope-binding and freezing conditions). Going a different way as done by so-called focus-based approaches (see Poschmann (2015), building on Artstein (2002a,b)) prevents stipulations like (i) but creates others; in particular, (iii) focus is supposed to trigger the *wh*-question meaning in E(*wh*)Qs but to act as mere information focus anywhere else in the respective languages, in our case English and German.[16] The upshot is, largely unintended, that E*wh*Qs are basically *constructions*.

While this result would not come as a surprise for many (cf. Finkbeiner & Meibauer 2016), we claim that it is largely due to a misconception of E*wh*Q focus structure, and thus can be avoided by making use of (wh-*focus*) and its normal information structural implications (cf. section 3.1). To prove the latter claim is the aim of section 4; here we want to deal with the former.

Previous studies were of course aware of echo *wh*-expressions always bearing main stress/narrow focus. But this was standardly equated with main stress/narrow focus on the *wh*-word *as a whole*, which implies that narrowly focused *wh*-expressions in *Wh*Qs are no different from those in E*wh*Qs. As already argued in Reis (1991)/(1992), and illustrated here by the examples in (3) vs. (4), this is wrong, for German as well as English: Only E*wh*Es exhibit (wh-*focus*) *i.e.* bear obligatory main stress/narrow focus on their *wh*-part.

In most cases the neglect of this difference has probably an innocuous reason: Most prominent E*wh*Q studies concentrate on English where due to the lack of polysyllabic *wh*-words (wh-*focus*) is not salient. But there is also a serious objection to (wh-*focus*) on record: Based on German data like (32a), Poschmann (2015: §§2.1.3, 6.1) argues that (wh-*focus*) also holds for in-situ *wh*-phrases in multiple *Wh*Qs, hence is just a formal marking of in-situ *wh*-phrases. If so, (wh-*focus*) is not unique to E*wh*Qs and has no information structural relevance, so using it for explaining the other E*wh*Q properties to be accounted for would lead to stipulations of the same order as those of previous approaches.

But Poschmann's argument misses the mark: While *wh*-in-situ phrases in multiple *Wh*Qs like (32a) *may* bear main stress on the *wh*-part there are decisive differences to E*wh*Es vindicating (wh *focus*): First, while in-situ *wh*-phrases in multiple *Wh*Qs are never without stress it need not be main stress, cf. (32b)-(33b) (cf. also Truckenbrodt 2012b, 2013). Second, no matter whether they bear main or secondary stress, stressing the *wh*-part is neither obligatory nor preferred; cf. the polysyllabic and complex *wh*-phrases in (32) vs. (33). Third, and most importantly, stressing the *wh*-part in these cases has no information structural significance: It is compatible with any focus-background partition of the non-*wh*-parts of the respective *wh*-phrases (thus, (32) may have *i.a.* the same information structural interpretation as (33)). That mere prosodic variation is at work is underlined by the fact that stress on the *wh*-part of those in-situ phrases may infect the initial *wh*-phrase (which is usually unaccented, cf. Haida (2007), Truckenbrodt (2012b), (2013)) suggesting that *wh*-part accenting in multiple *Wh*Qs is no more than a kind of optional 'list intonation' pattern.

[16] This is true for Artstein's as well as Poschmann's version of this approach (see Reis 2012: 15). For further critical discussion of Artstein's analysis, see Sudo (2006), Eckardt (2007), Poschmann (2015: 98-100).

(32) a. WER/Wer hat WIE viel WOfür/für WELche Partei gespendet? (\)
who has how much what-for/for which party donated
'WHO/Who donated HOW much for WHAT/to WHICH party?'
b. Wer/Wer hat wie viel wofür/für welche Partei im MAI gespendet? (\)
who has how much what-for/for which party in May donated
Who/who donated how much for what/to which party in MAY?
[underlining marks indicate secondary stress]

(33) a. WER/Wer hat wie VIEL woFÜR/für welche ParTEI gespendet? (\)
who has how much what-for/for which party donated
'WHO/Who donated how MUCH for WHAT/for which PARty?'
b. Wer/Wer hat wie viel wofür/für welche Partei im MAI gespendet? (\)
who has how much what-for/for which party in May donated
'Who/who donated how much for what/to which party in MAY?'

All these points are at odds with (wh-*focus*), which thus proves to be unique to E*wh*Qs (see also section 5.4 below).[17] Moreover, there is no reason whatever to interpret the stress pattern of the EwhEs as a purely formal marking of in-situ wh-phrases (cf. also note 12). The obvious strategy is then to interpret the stress pattern of E*wh*Es in terms of the standard interpretation of focus. As sketched in section 3.1 and worked out in sections 4.2 and 4.3, this is what our analysis does.

Having clarified where we depart from previous approaches and why, let us now turn to developing our own approach.

4. The analysis

Section 4.1. introduces a phrasal *Q* operator in the analysis of E*wh*Qs. Section 4.2. suggests an interpretation of focus on the *wh*-part of the E*wh*E. A compositional semantic analysis is proposed in section 4.3., putting everything together and deriving the core empirical properties of E*wh*Qs.

4.1 Phrasal *Q* and the non-operator status of E*wh*Es

Let us first examine the non-operator status of E*wh*Es in more detail. In order to achieve an account that is non-stipulative as well as descriptively successful, we have to assume that (minimal) *wh*-phrases in *Wh*Qs and E*wh*Qs have the same lexical structure.[18] Hence E*wh*Es contain a variable, the

[17] Cases like (i), which have no E*wh*Q reading, are no counterexamples either: While the *wh*-part of the *wh*-phrase is clearly more prominent than its sortal part (giving the question a specific expressive flair) the *wh*-part only bears a secondary accent; the main accent is preferably located in the VP indicating wide(r) focus. As soon as main stress shifts to the *wh*-phrase, a non-E*wh*Q interpretation requires stressing the last syllable, *i.e.* the sortal part.

(i) Wàrum hast du mich verLASsen? (\)
why have you me left
'Why oh why did you leave me?' (\)

[18] The qualification 'minimal' is necessary because unlike regular *wh*-phrases, E*wh*Es cannot be 'complex' (otherwise E*wh*Qs like (19) above would be impossible), that is there is no unsaturated interrogative element to percolate/project to the top of the phrase. Given the non-operator status of E*wh*Es this is of course what to expect. (Note that this distinction between E*wh*Es and regular *wh*-phrases doesn't disappear if 'complex' *wh*-phrases (i.e. *wh*-phrases involving 'pied-

wh-element. This is narrowly focused (see (wh *focus*)). We suggest that the *wh*-variable is evaluated locally. A rather natural way to achieve this is the following:

First, generalizing the analysis of E*wh*Es suggested in passing by Den Dikken & Giannakidou (2002: 55),[19] we assume that *all* (minimal) *wh*-phrases contain the *Q* operator, cf. (34a), *Q* being in a position from which it is able to locally bind the *wh*-variable. This looks suggestively similar to what can be observed in languages like Japanese, Sinhala or Tlingit that mark *Wh*Qs and *Wh*Q-internal *wh*-phrases with the same overt *Q* morpheme (cf. Hagstrom (1998), Kishimoto (2005), Cable (2007, 2010), Slade (2011)), but there are two differences: Our *Q*-operator is a) covert, b) directly responsible for deriving a question meaning, i.e. *Q* is the question operator.[20] This, however, doesn't rule out drawing *syntactic* analogies.

Thus, *second*, we adopt the idea from the syntactic analyses of these language data that *Q*-doubling of clause-initial and phrasal *Q* is eliminated by phrasal *Q* (optionally) giving way, be it by *Q*-movement to the initial position (via feature attraction as proposed in (Hagstrom 1998)) or *Q*-deletion under redundancy (in analogy to what is proposed for *Q*-related F in Truckenbrodt (2013: 159)); see (34b).

(34) a. (Minimal) *wh*-phrases are lexically *Q*-marked.
b. If there is a clause-initial *Q*, phrasal *Q* is optionally eliminated.

By (34a,b) we get the three clause patterns involving *Q* there are in English and German (and only these!), cf. (35): (35i) represents the structure of regular *Wh*Qs, (35ii) of E*wh*Qs with *wh*-interrogative structure, (35iii) of all other E*wh*Qs, with phrasal *Q* locally binding the *wh*-variable in the last two cases. Thus, the E*wh*Es e.g. in (27) are non-operators as desired.

(35) (i) $[_{CP}\ Q \ldots\ [_{whP}\ \ldots\ ]\ \ldots\ ]$
(ii) $[_{CP}\ Q \ldots\ [_{whP}\ Q \ldots]\ \ldots\ ]$
(iii) $[_{CP}\ \ldots\ [_{whP}\ Q \ldots]\ \ldots\ ]$

This solves the puzzle of how E*wh*Es come to not behave like operators syntactically. What remains to be explained is the 1:1 correlation between ±non-operator status of *wh*-phrases and ±focusing of their *wh*-part. That is, a *wh*-expression is a non-operator if and only if there is narrow focus on *wh*. This correlation is clearly mediated by whether or not the *wh*-phrase retains phrasal Q by virtue of (34a,b): *Wh*-phrases retaining *Q*, that is E*wh*Es, must be focused on their *wh*-part, *wh*-phrases not retaining *Q* must not.

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piped' material) are handled without *wh*-feature percolation/projection, cf. Cable (2007, 2010), Heck (2008); it is still reflected in positional constraints on *wh*-words with respect to 'pied piped' material that EwhEs don't obey.)

[19]However, Den Dikken & Giannakidou's analysis differs from ours in that, in keeping with the common opinion (see section 3.2), they assume E*wh*Es to be just normally focused. But although normally focused *wh*-quantifiers, like E*wh*Es, tend to have wide scope and no pair list readings (see Pafel 2005: 82-83 and *passim*), they a) can be embedded, b) remain scope-bound in embedded position. Both, crucially, is impossible for E*wh*Es (cf. section 2.3), the reason being their different focus structure, i.e. (wh *focus*).

[20] In the analyses of the languages referred to, it is the complementizer rather than the *Q*-particle that is taken to be responsible for the question semantics. The combination of *Q*-particle + *wh*-word may also yield *wh*-indefinites, which suggests interpreting *Q*-particles as contributing mainly existential quantifiers in these languages. (Thanks to an anonymous reviewer for insisting on this point.) But note that we investigate the interrogative operator *Q*, not the semantics of *Q*-particles. None of the *Q* analyses offered by Cable and others pays attention to the relation between *Wh*Qs and E*wh*Qs in the respective languages, which primarily motivates our handling of the *Q* operator. There is no telling how incorporating E*wh*Q data into these analyses would change their conception of the interaction of *Q*-particles and question operators We cite these approaches for their syntactic analysis.

We offer the following somewhat tentative explanation for this correlation: Focus on *wh* is required by the intended use as an E*wh*Q: The EU provides an appropriate antecedent for the E*wh*Q (see below for a more precise analysis). Thus we have focus on *wh* in E*wh*Qs and only in E*wh*Qs. We propose that English and German allow phrasal *Q* if and only if *wh* is focused. In order to derive this, we adopt (36):

(36) Covert operators must be made visible by virtue of appropriate means.

Clearly, *Q* is a covert operator in *Wh*Qs as well as E*wh*Qs. Since English and German no longer use particles for fulfilling (36), different means are required: As for clausal *Q* in *Wh*Qs, this is attraction of a *wh*-phrase via *wh*-movement; as for phrasal *Q* in E*wh*Qs, the only means left is focusing the *wh*-part of the E*wh*E containing *Q*. But if phrasal *Q* can only be made visible by focus on *wh,* and only E*wh*Qs have focus on *wh*, one direction of the correlation is explained. The other direction follows from interpretability. An E*wh*E without *Q* would be uninterpretable (see section 4.3 for a precise analysis). Since there is no clausal *Q*, there has to be phrasal *Q*.

While (36) is not precise, such a condition is well motivated (e.g. Platzack 1998). Wherever sentence mood operators have been employed, they are bound up with certain (combinations of) form features, hence made 'visible' by them.[21] In addition to the *Q* operator, a case in point is the Roothean Squiggle operator, which must become overtly visible, in German and English by prosodic focus realization - i.e. the covert operator ~ must be made visible by an F-marked constituent in its scope (Truckenbrodt (1995)). We must leave a more detailed investigation of this large issue for future research.

In sum, by appealing to the assumptions (34a,b), (36) – plausible ones it seems to us –, the syntactic non-operator behavior of E*wh*Es can be derived, and a promising explanation for its 1:1 correlation with (wh-f*ocus*) suggested. The analysis with phrasal *Q* captures (*non*-wh-*op*) and (*Q*).

(*non*-wh-*op*) E*wh*Es are syntactically not *wh*-operators.
(*Q*) E*wh*Qs do not have a clausal *Q* operator.

4.2 Focused *wh* has a deictic/anaphoric alternative

We turn now to a second central aspect of our analysis, the derivation of the echo effect (*echo*). Our claim is in short that the echo effect is an effect that can be derived from (wh *focus*) by way of the alternative to *wh* being anaphorically available in the context.

(*echo*) Clauses in E*wh*Q form convey the impression that the *wh*-expression marks a gap the discourse participants know has been closed before.

(wh *focus*) E*wh*Es bear obligatory main stress/narrow focus on their *wh*-part.

[21] (36) was first inspired by Platzack's (1998) "visibility condition for the C-domain". Platzack motivates it by the specific function of this domain to "relate the sentence to context" ("context" including in particular force value), which calls for overt expression (*ibid.*: 58, 95-96). (36) is a generalized, function-oriented version of this condition such that phrasal *Q* or the Squiggle operator, despite being outside the C-domain, also fall under it. We leave open at the moment whether the generalization to 'covert operators' in (36) is too broad (an objection raised by an anonymous reviewer). (A possible alternative is reducing (36) to just covering sentence mood operators as originally envisioned by Platzack but in- *and* outside the C-domain – which would still include phrasal *Q*.)

As stated above, we assume that focus plays the same information structural role in E*wh*Qs as everywhere else in German and English. This contrasts with the majority opinion that *wh*-phrases in general and/or E*wh*Qs in particular have special focus properties but it is not only the simpler hypothesis but also fits better with the facts, at least in languages like German or English.[22]

Accordingly, we follow the usual assumptions on information structure (based on Rooth (1992); also Schwarzschild (1999), for a recent synthesis see Rochemont (2016)): (a) Focused constituents are regularly marked by main stress; (b) focusing highlights the information content of these constituents, highlighting being effected by overtly expressing one alternative out of a contextually salient alternative set.

How then is the E*wh*Q information structure to be interpreted? We assume that

– (i) Only *wh* is in focus, everything else is backgrounded,
– (ii) Focus on *wh* gives rise to alternatives, hence *wh* and the question meaning is one alternative out of a contextually salient alternative set.

But what alternatives does this set consist of? We propose that focus on the *wh*-part induces just two alternatives, one being the E*wh*Q, the other one a proposition in which the E*wh*E is replaced by a deictic/anaphoric expression of the same type. This is illustrated informally in (37): the alternatives evoked by (37a) are (37b) (note that (37b) is a set containing two meanings; section 4.3 will make this formally explicit).

(37) a. Tom geht WOhin?
Tom goes WHERE-to
'Tom is going WHERE?'
b. *alternatives:* {Where is Tom going?, that Tom is going there}

This is a core component of our analysis:

– (iii) The set of alternatives evoked by *wh*-part focusing is:
{question, deictic/anaphoric propositional counterpart}.

Accordingly, the context of the E*wh*Qs provides the non-question alternative.

A suggestive piece of evidence is supplied by the following observations on the German *wh*-word *wieso* (roughly meaning 'why'):

Wieso 'why' has two singular properties among the *wh*-words of Standard German: a) It is the only one that does not tolerate stress on its *wh*-part; b) while occurring in *Wh*Qs, initially as well as *in-situ* (38a,b) it never occurs in E*wh*Qs (38c). In order to explain this singular behavior, recourse can be had to an old observation by T.N. Höhle (p.c.) that there are deictic/anaphoric pronoun alternatives to all German *wh*-words except for *wieso* 'why', cf. (39).

(38) a. Wieso/WieSO wurde Tom versetzt? (\)
why was Tom transferred

[22] This holds for both variants of the majority opinion, the radical one which claims the existence of a separate '*Q*-related' focus inducing the question meaning in general (see Haida (2007), and especially Truckenbrodt (2013)), or at least in E(*wh*)Qs (see Artstein (2002a), (2002b), Poschmann (2015)), as well as the somewhat weaker claim that *wh*-phrases are inherently focused, and thus *per se* outside the normal accent/focus regularities (see the overview in Sabel (2006: 160-167)). For pertinent criticisms of these variants, see Reich (2003: 70-72), Eckardt (2007), Reis (2016: 216-217), and with particular reference to the critical Hungarian data, Cable (2008).

'Why was Ton transferred?'

b. [Finde heraus] wer damals wohin wieso versetzt wurde.
[Find out] who then where-to why transferred was
'Find out who was transferred where why back then.'

c. Tom wurde WARum/*WIEso versetzt? (/)
Tom was why transferred
'Tom was transferred WHY?'

(39) *wer – der, was – das, wohin – dahin, womit – damit, weshalb – deshalb,*
who – the, what – that, where(to) – there(to), what-with – that-with, why – therefore,
wie – so, inwiefern – insofern, was für (ein) – so (ein), ... , ***wieso – *daso/*soso***
how – so, in-how-much – inasmuch, what (a) – such (a), ... , how-so – there-so/so-so

It is plausible that the absence of this alternative excludes *wieso* from E*wh*Qs.

Our assumptions regarding alternatives to focused *wh* allow us to understand and derive the echo effect:

The echo effect (*alias* the E*wh*Q use potential as sketched in section 2.2) can be equated with the discourse appropriateness constraints on focus, by which a E*wh*Q presupposes that its deictic/anaphoric propositional counterpart is given in context. This accounts for everything it should: for all kinds of reactive echoes including content echoes, hence (*content*), for the echo effect of initiative E*wh*Qs and E*wh*Qs out of context, and last but not least, by virtue of the deictic/anaphoric element requiring an immediate antecedent, for the condition (*adjacency*).

The second effect of (wh-*focus*) is that phrasal *Q* is allowed. Phrasal *Q* is crucial in deriving the question meaning of E*wh*Qs in an alternative semantic framework. The next section spells out this derivation and the derivation of the deictic/anaphoric propositional alternative in terms of a formal analysis; i.e. section 4.3. provides the compositional implementation of what we have proposed here.

4.3 Compositional derivation of the echo-effect and the E*wh*Q question meaning

This section provides a compositional analysis of how to derive from the distinctive formal properties of E*wh*Qs - (wh *focus*) and phrasal *Q* - their interpretive characteristics: the semantics of a *wh*-question, and a 'given' alternative which is the deictic/anaphoric propositional counterpart to the question. In section 4.3.1 we introduce the compositional semantics of questions we assume. This is the baseline for developing a compositional semantics for E*wh*Qs, which we do in section 4.3.2. Section 4.3.3 provides a more comprehensive discussion of the alternatives involved in E*wh*Qs – their motivation and their pragmatic effect, *i.e.* the echo property (*echo*).

4.3.1 Background: Alternative semantic analysis of *wh*-questions

We adopt the analysis in Beck (2006) for the semantic composition of question meanings (for related proposals, see *e.g.* Hamblin (1973), Ramchand (1997), Shimoyama (2001), Beck & Kim (2006); for recent discussion, Kotek (2014) and Beck (2016)). We present here a simplified version. The analysis uses a two-tiered system (Rooth 1992): We distinguish the ordinary semantic value of

a linguistic expression α, $[[\alpha]]_o$ from its focus semantic value or (more generally) alternative semantic value $[[\alpha]]_{Alt}$.

We begin by illustrating how this system works for an example with focus, see (40):

(40) EDE proved theorem L.

Focus on 'Ede' doesn't affect the ordinary meaning of the name; the name still refers (let's assume) to the individual Thomas Ede Zimmermann, (41a). But it triggers the introduction of alternatives to the focused element into the semantics, that is alternative individuals, (41b).

(41) a. $[[Ede_F]]_o$ = Thomas Ede Zimmermann
b. $[[Ede_F]]_{Alt}$ = { Wolfgang Sternefeld, Irene Heim, ...}
= {x|x∈D}

Just as in the composition of ordinary semantic values, focus alternatives are passed on to larger constituents containing the focused item. For the sentence as a whole, we want to derive (42).

(42) $[[Ede_F$ proved theorem L$]]_o$ = λw.Thomas Ede Zimmermann $proved_w$ theorem L
$[[Ede_F$ proved theorem L$]]_{Alt}$ = {λw.Wolfgang Sternefeld $proved_w$ theorem L,
λw.Irene Heim $proved_w$ theorem L, ...}
= {λw.x $proved_w$ theorem L | x∈D}

To make this happen, let's first make explicit what the semantics of focused expressions is: a set of semantic objects of the same type as, but not identical to, the focused expression.

(43) a. $[[\alpha_F]]_o = [[\alpha]]_o$
b. $[[\alpha_F]]_{Alt} = \{x: x \in D_\sigma \ \& \ x \neq [[\alpha]]_o\}$ (where σ is the type of α)[23]

It is in general tacitly assumed that it is not the whole denotation domain, but only a relevant subset of it, that is actively involved in focus semantics. We make this explicit as the set Alt(α) in (44) – it will become relevant later.

(44) Alt(α):= the set of contextually relevant alternatives to α

[23] This is a trivial departure from a strictly Roothean semantics, which includes the ordinary semantic value in the set of alternatives. We do this for convenience, in order to use slightly simpler composition. Note that the original Rooth set is recoverable by $\{[[\alpha]]_o\} \cup [[\alpha]]_{Alt}$, so this a formal modification only.
If the ordinary semantic value is also an alternative, in the case of E*wh*Qs we are led to a mixed alternative set containing one proposition and one set of propositions. The compositional calculation would thus simultaneously use FA and PFA. The required definition is given in (i) (see e.g. Slade (2011) for a recent analysis that uses it).

(i) If α is a branching node whose daughters are β and γ, then for any g:
$[[\alpha]]_o^g = [[\beta]]_o^g \oplus [[\gamma]]_o^g$,
and $[[\alpha]]_{Alt}^g = [[\beta]]_{Alt}^g \oplus [[\gamma]]_{Alt}^g$
where a⊕b =
a. a(b)
b. {c: ∃b'∈b[c=a(b')]}
c. {c: ∃a'∈a[c=a'(b)]}
d. {c: ∃a'∈a ∃b'∈b[c=a'(b')]}, whichever is defined.

Normally, $Alt(\alpha) \subseteq [[\alpha]]_{Alt}$

e.g. $Alt(Ede_F)$ = {Irene Heim, Wolfgang Sternefeld}

Next, the interpretation component of the grammar is going to have to handle alternative sets in addition to ordinary semantic values. The standard mode of composing two meanings is function application, (45). For the purpose of combining alternatives, we add to this pointwise function application. See Beck (2016) for a detailed presentation of such a system of compositional interpretation.

(45) *Function Application FA*:
If $[[\beta]]$ is a function whose domain includes $[[\gamma]]$ then $[[\beta]] \oplus [[\gamma]] = [[\beta]]([[\gamma]])$.

($X \oplus Y$ stands for the composition of two semantic values X and Y)

(46) *Pointwise Function Application PFA*:
If $[[\beta]]$ is a set of functions β' and $[[\gamma]]$ is a set containing elements of the domain of β', then $[[\beta]] \oplus [[\gamma]] = \{\beta'(\gamma') : \beta' \in [[\beta]] \text{ and } \gamma' \in [[\gamma]]\}$

The actual composition principle will then use, for the composition of the meanings of two daughter constituents, regular FA at the level of ordinary meaning and PFA at the level of alternative semantic values.

(47) *Composition of branching nodes* (1st version):
If α is a branching node whose daughters are β and γ, then for any g:
$[[\alpha]]_o^g = [[\beta]]_o^g \oplus [[\gamma]]_o^g$ via FA, if defined, undefined otherwise.
$[[\alpha]]_{Alt}^g = [[\beta]]_{Alt}^g \oplus [[\gamma]]_{Alt}^g$ via PFA, if defined, undefined otherwise.

(For simplicity, we ignore here other modes of composition like Predicate Modification PM and Predicate Abstraction PA; see Beck (2016) for a more complete framework.)

In this manner we can calculate the desired semantic values for our example (non-focused constituents contribute the singleton set of their ordinary meaning to alternative composition):

(42') $[[Ede_F]]_o \oplus [[\text{proved theorem L}]]_o =$
$[[\text{proved theorem L}]]_o([[Ede_F]]_o) =$ (FA)
$\lambda w.\text{Thomas Ede Zimmermann proved}_w \text{ theorem L}$
$[[Ede_F]]_{Alt} \oplus [[\text{proved theorem L}]]_{Alt} =$
$\{\beta'(\gamma') : \beta' \in [[\text{proved theorem L}]]_{Alt} \text{ and } \gamma' \in [[Ede_F]]_{Alt}\}$ (PFA)
$\{[\lambda y.\lambda w.y \text{ proved}_w \text{ theorem L}](x) \mid x \in Alt(Ede_F)\} =$
$\{\lambda w.x \text{ proved}_w \text{ theorem L} \mid x \in Alt(Ede_F)\}$

The ordinary semantic value is the proposition expressed by (40). The alternative semantic value, following (informally) Rooth (1992), is used to analyse anaphoric properties of focus in discourse. For example, (40) is an appropriate answer to the question 'Who proved theorem L?', whose meaning is the same set of alternatives (see below) and which (40)'s focus picks up anaphorically. That is, the alternative semantic value has to be available in the context.

Note that when we just consider focus, a rather simple view suggests itself: $[[\alpha]]_o^g$ concerns the semantics, the ordinary meaning. $[[\alpha]]_{Alt}^g$ is for the pragmatics, *e.g.* the discourse appropriateness of α.

Next, we add constituent questions to this picture. Following Hamblin (1973) among many others, questions denote sets of alternative propositions (the answers to the question). Example (48a) is interpreted as in (48b), and similarly in (49).

(48) a. Who proved theorem L?

b. $[[\text{Who proved theorem L? }]]_o$
$= \{\lambda w.\text{Thomas Ede Zimmermann proved}_w \text{ theorem L},$
$\lambda w.\text{Wolfgang Sternefeld proved}_w \text{ theorem L},$
$\lambda w.\text{Irene Heim proved}_w \text{ theorem L}, ...\}$
$= \{\lambda w.x \text{ proved}_w \text{ theorem L} \mid x \in D\}$

(49) a. What did Tim buy?

b. $[[\text{ What did Tim buy? }]]_o = \{\lambda w.\text{Tim bought}_w \text{ 'North \& South'},$
$\lambda w.\text{ Tim bought}_w \text{ 'Cranford'}, ...\}$
$= \{\lambda w.\text{Tim bought}_w x \mid x \in D\}$

How are these denotations derived compositionally? The input to interpretation is a structure with a *Q* operator. We concretely assume (50b) where *Q* is in the C position with IP as its sister (nothing hinges on the details).

(50) a. What did Tim buy?

b. [Q [$_{IP}$ Tim bought what]]

It is intuitively obvious that the *wh*-expression is responsible for generating alternatives (similar to focus). In contrast to focused phrases, *wh*-phrases have no other semantic role. Accordingly we analyze their ordinary meaning as undefined. The *Q* operator saves structures with *wh*-expressions from uninterpretability (*i.e.* from not having an ordinary semantic value), by raising their alternative semantic value to the level of ordinary meaning.

(51) a. $[[wh]]_o$ is undefined.

b. $[[wh]]_{Alt} = \{x: x \in D_\sigma\}$ (where σ is the type of wh's sister's argument)

e.g. $[[what]]_{Alt} = \{x: x \in D_e \text{ \& x a thing}\}$

(52) $[[Q\ IP]]_o = [[IP]]_{Alt}$

With these assumptions regarding questions, the composition proceeds as demonstrated below:

(53) a. $[[\text{bought what}]]_o$ is undefined

b. $[[\text{bought what}]]_{Alt} = \{\lambda y.\lambda w.y \text{ bought}_w \text{ 'North \& South'},$
$\lambda y.\lambda w.y \text{ bought}_w \text{ 'Cranford'}, ...\}$
$= \{\lambda y.\lambda w.y \text{ bought}_w x \mid x \in D\}$

(54) a. $[[\text{Tim bought what}]]_o$ is undefined

b. $[[\text{Tim bought what}]]_{Alt}$ = {λw.Tim bought_w 'North & South',
λw. Tim bought_w 'Cranford', ...}
= {λw.Tim bought_w x | x∈D}

(55) $[[\ [Q\ [_{IP}$ Tim bought what]]]]$_o$ = {λw.Tim bought_w x | x∈D}

To sum up section 4.3.1, the meaning of a question (its semantics) is a set of alternative propositions (the answers to the question). Evoking such a set of alternatives pragmatically sets up a choice situation. A 'standard' discourse interpretation is as a request to identify true vs. false alternatives. The appropriate response then is to state the true alternative(s) in the set. This is derived here compositionally by making the *wh*-expression the alternative trigger and the *Q* operator responsible for lifting the resulting meaning to the level of ordinary semantics.

Note that this semantics of questions blurs a little the simple view contemplated above (ordinary meaning is for semantics, alternatives are for pragmatics) since $[[\alpha]]_{Alt}$ is used for something strictly semantic, the question meaning. Note also that saying that *wh* is an alternative trigger is not the same thing at all as saying that the *wh*-phrase is "inherently focused" (a misrepresentation found e.g. in Slade (2011), and others, cf. note 22; see also Eckardt (2007) for discussion). Focused *wh* sets apart E*wh*Qs from ordinary *wh*-questions, and this is analyzed below.

4.3.2 Compositional interpretation – Semantics of E*wh*Qs

Next, we add E*wh*Qs to this system. As anticipated above, their ordinary semantic value is a set of propositions (just like 'normal' *wh*-questions). What is interpretively more special about them is their pragmatics: discourse appropriateness constraints are at work that aren't in the case of canonical *wh*-questions – the echo effect. Following our reasoning in section 4.2, the discourse appropriateness constraints follow from focus on *wh*, which gives rise to the deictic/anaphoric propositional alternative. This is the second output of our compositional calculation.

But let's begin with the semantics. We are of course going to stick to our assumptions regarding *wh*-expressions from before:

(56) a. $[[\text{wh}]]_o$ is undefined
b. $[[\text{wh}]]_{Alt}$ = {x: x∈D_σ } (where σ is the type of wh's sister's argument)

But we add to them the assumption that a focused *wh*-phrase makes a particular alternative available. (57c), (58c) spell out what we said in section 4.2 in the composition (we use a metavariable like z or a demonstrative like *that* to represent the deictic/anaphoric alternative in the calculation):

(57) a. $[[\text{wh}]]_o$ is undefined.
b. $[[\text{wh}]]_{Alt}$ = {x: x∈ D_σ } (where σ is the type of wh's sister's argument)
c. Alt(wh) = {z} (where z is the unique contextually relevant element of D_σ)

(58) *e.g.* [[wh_Fat]] written as [[what_F]]:

a. $[[\text{what}_F]]_o$ is undefined
b. $[[\text{what}_F]]_{Alt}$ = {x: x∈D_e & x a thing}
c. Alt(what_F) = {z} (z the unique relevant entitiy in D_e)

= {that}

Moreover, a phrasal *Q* means that we combine immediately with a *Q* operator as indicated in (59).

(59) $[[Q\ wh_F]]_o = [[wh]]_{Alt} = \{x: x \in D_e\}$
$[[Q\ wh_F]]_{Alt} = \{z\}$ (where z is the unique element of Alt(wh))

In order to compose the meanings of larger structures, we now need to be able to combine alternatives at the level of ordinary semantics *and* at the level of alternative semantic values.

(60) *Composition of branching nodes* (revised):
If α is a branching node whose daughters are β and γ, then for any g
$[[\alpha]]_o^g = [[\beta]]_o^g \oplus [[\gamma]]_o^g$ via FA or PFA, if either is defined, undefined otherwise.
$[[\alpha]]_{Alt}^g = [[\beta]]_{Alt}^g \oplus [[\gamma]]_{Alt}^g$ via PFA, if defined, undefined otherwise.

In (62) and (62') we provide the composition steps involved in example (61):

(61) a. Tim bought WHAT?
b. [Tim [bought [Q $what_F$]]]

(62) a. $[[$ bought $[Q\ what_F\ ]\ ]]_o$ $= \{\lambda y.\ \lambda w.y\ bought_w\ x | x \in D\}$
b. $[[$ bought $[Q\ what_F\ ]\ ]]_{Alt}$ $= \{\lambda y.\lambda w.y\ bought_w\ z\}$

(62') a. $[[$ Tim bought $[Q\ what_F\ ]\ ]]_o$ $= \{\lambda w.Tim\ bought_w\ x | x \in D\}$
= what did Tim buy?
b. $[[$ Tim bought $[Q\ what_F\ ]\ ]]_{Alt}$ $= \{\lambda w.Tim\ bought_w\ z\}$
$= \{$Tim bought that$\}$
(via (60))

Clearly, this compositional analysis derives the constituent question meaning of E*wh*Qs, as desired. The next subsection discusses in more depth the alternatives involved, i.e. the alternative semantic value assumed e.g. in (62'b).

4.3.3 Compositional analysis of focused *wh* - Pragmatics of E*wh*Q

First, we address the issue of the deictic/anaphoric alternative we assume for focused *wh* from a compositional perspective. Then we come to how it is used in the pragmatics.

Motivating the unusual alternative semantic value: Standardly, the alternatives to an expression α are semantic objects of the same type as α; *i.e.* the alternative semantic value is a set of objects of the type of α. For example:

(63) a. alternatives to 'Ede': {x: x is an individual}
$[[Ede_F]]_{Alt} = \{ x | x \in D\}$
b. alternatives to 'buy': {R: R is a relation between two individuals}
$[[buy_F]]_{Alt} = \{ R | R \in D_{<e,<e,<s,t>>>}\}$

Remember that we write Alt(α) for the set of contextually relevant such alternatives:

(64) a. Alt(Ede) = {Wolfgang Sternefeld, Irene Heim, ...}
b. Alt(buy) = {borrow, steal, make,...}

Normally, Alt(α)$\subseteq$[[α]]$_{Alt}$

What would this view lead to in the case of focus on *wh*?

The first problematic issue is that *wh* itself introduces alternatives and does not have an ordinary semantic contribution to begin with; see *e.g.* (65).

(65) a. [[what$_F$]]$_o$ is undefined
b. [[what$_F$]]$_{Alt}$ = {x|x$\in$D$_e$}

Suppose we ignore this problem and work with the one semantic value we have, the alternative semantic value, instead. If we simply use [[wh]]$_{Alt}$, what would be alternatives to that? The alternative semantic value being a set, *e.g.* the set of relevant individuals, its alternatives would be other sets. But which other sets – irrelevant individuals?, properties?

(66) [[what$_F$]]$_{Alt2}$ = {{x|x$\in$D$_e$}, {...?...}, ...}

So it is not clear what this move would lead to. It is in fact not worth thinking too deeply about it: even if we had such higher order alternatives, they would not be usable by the grammar. They are of the wrong type to be the input to focus/alternative sensitive rules (they would be sets of sets of alternatives).

Hence our proposal, repeated in (67), (68): an alternative semantic value for focused *wh* is available just in case Alt(wh) is defined and of a usable *lower* type. This is the deictic/anaphoric alternative. Unusually, it is not the case that Alt(α)$\subseteq$[[α]]$_{Alt}$.

(67) Alt(wh$_F$) = {z: z is the unique contextually relevant object of the appropriate type}
Alt(what$_F$) = {z$_e$} = {that}

(68) a. [[Q what$_F$]]$_{Alt}$ = {z} (where z is the unique element of Alt(wh))
b. [[Tim bought [Q what$_F$]]]$_{Alt}$ = { λw.Tim bought$_w$ z}
= { Tim bought that}

Suppose that the structure in (68b) occurs in the context in (68'). In this context, there is a unique contextually relevant object of type <e>, namely 'North and South'. This is the referent in this context for the element Alt(what$_F$), which we represent generally as z or *that*.

(68') A: Tim bought 'North and South'.
B: Tim bought WHAT?

Plausibly, such an object needs to be provided in the context in order for Alt(wh$_F$) to be available. This leads us towards the appropriateness condition for E*wh*Qs, the 'echo effect' from above.

To sum up, it follows from the semantics that focus on *wh* needs special licensing contexts. This is the source of the peculiar alternative set.

Pragmatic use of the alternative semantic value of the EwhQ: How does the alternative semantic value in (69) relate to the discourse conditions on E*wh*Qs?

(69) $[[\text{ Tim bought [Q what}_{F}\text{]]]}_{Alt}$ = {Tim bought that}

Here is the pay-off of our unusual alternative set. We propose quite simply that focus is evaluated as contrast:

(70) Contrast (Rooth):
A constituent X contrasts with a constituent Y iff $[[Y]]_o \in [[X]]_{Alt}$ and $[[Y]]_o \neq [[X]]_o$.

In our example, a contrast to an E*wh*Q is provided by an expression *Y* with the following property:

(71) $Y \in$ {Tim bought that} and $Y \neq [[\text{What did Tim buy?}]]_o$

That is, a constituent *Y* with the meaning "Tim bought that" is around in the context. This constituent stands in a contrast relation to the echo-*wh*-question. In example (68'), the proposition expressed by (68'A) is the constituent *Y* which the focus in the E*wh*Q picks up by way of contrast.

This means that there has to be a constituent with the meaning 'Tim bought that', or generally the deictic/anaphoric propositional alternative, given in the context in order to satisfy focus evaluation (Rooth's 1992 contrast case of focus evaluation), as anticipated in section 4.2. This is the echo effect as characterized above.

Typically, the answer to the E*wh*Q is entailed by the context (i.e. the answer is already known). But it is worth noting that being given or available is not the same as entailment, and being given is what we need here. This is shown by the following examples, where the deictic/anaphoric propositional alternative is not entailed.

(72) A: Anne thinks that Tim bought a saxophone.
B: Tim bought WHAT?

(73) A: Did Melanie invite the pope to her party?
B: Did Melanie invite WHO to her party?
'For which x: Did Melanie invited x?'

The deictic/anaphoric alternative introduces a property we could call uniqueness: 'that', for example, would refer to one particular semantic object. Our formulation reflects the intuition that one particular salient answer to the E*wh*Q is given in the context, and this is what the E*wh*Q is anaphoric to. Does there have to be a unique given proposition/object in the context? This is difficult to judge because of contextual relevance on the one hand (the option of reducing things to the unique relevant object) and pluralization on the other (the option of lumping several things together). (74) illustrates. We do not see that an interesting point can be made here and leave it at that.

(74) a. A: Anne invited Brittany, Cody and the pope.

B: Anne invited WHO? z:= the unique relevant x, the pope

b. A: ... and to this stew, you add garam marsala and pizza spice mix ...
B: You add WHAT? z:= marsala+pizza spice

Note that echo-*wh*-questions reverse the simple view that the ordinary meaning, a 'simple' type, concerns the semantics, while alternatives – the 'set' type – are for the pragmatics. In E*wh*Qs, the ordinary meaning is a set of alternatives (via questions) already during composition (via phrasal *Q*); the pragmatic effect comes in via the 'simple' type, the deictic/anaphoric alternative.

In sum, the unusual effect of focus on *wh* on the alternative semantic value of the expression containing it derives the echo effect (*echo*).

4.4. Section summary

Our analysis compositionally derives the *wh*-question semantics of E*wh*Qs. It does so on the basis of our position (*auto*), and in the face of the obvious difficulty that (*non*-wh-*op*) and (*Q*) pose compared to the compositional interpretation of ordinary *wh*-questions. A key assumption has been the phrasal *Q* operator, without which E*wh*Qs should have been uninterpretable.

(*auto*) E*wh*Qs are regular and fully transparent grammatical structures.

(*non*-wh-*op*) E*wh*Es are syntactically not *wh*-operators.
(*Q*) E*wh*Qs do not have a clausal Q operator.

The phrasal *Q* operator is licensed by (wh *focus*). The second effect of (wh *focus*) is to introduce the deictic/anaphoric counterpart to *wh* into the calculation at the level of alternative semantic values. The pragmatic effect – derived compositionally from a standard analysis of focus – is that the E*wh*Q presupposes that a particular answer to the question is available in the context. This is the echo effect (*echo*), including its features (*content*) (what is given is a propositional content, not an utterance or an antecedent structure) and (*adjacency*) (focus always relates to the immediately context).

(wh *focus*) E*wh*Es bear obligatory main stress/narrow focus on their *wh*-part.
(*adjacency*) E*wh*Qs always echo the *immediately preceding* utterance.
(*content*) E*wh*Qs are related to their EUs by way of content.
(*echo*) Clauses in E*wh*Q form convey the impression that the *wh*-expression marks a gap the discourse participants know has been closed before.

5. Some consequences

This section follows up on some consequences of the proposed analysis. We observed earlier that E*wh*Qs do not give rise to intervention effects. This is derived by our analysis, as discussed in section 5.1. We have come across echo questions other than declarative-based E*wh*Qs, and we come back to them in section 5.2. We offer a perspective on E*wh*Qs cross-linguistically in section 5.3 and on focused alternative triggers in section 5.4.

5.1 No intervention effects in E*wh*Qs

The compositional interpretation of questions sketched in section 4 was developed in particular to capture intervention effects. It is interesting to check how intervention effects fare in E*wh*Qs, both empirically and analytically. The fact is, as mentioned in section 2, that there seem to be no intervention effects in E*wh*Qs; the system in section 4 correctly predicts this. The reason is that *Q* is part of the *wh*-expression in E*wh*Qs and can rescue the *wh*-expression from undefinedness before any intervener would interfere.

But let's look in some more detail at intervention effects in ordinary *wh*-questions. (75) illustrates that in German, a focus sensitive or quantificational element like *only* and *nobody* cannot intervene between a *wh*-phrase in situ and its licensing complementizer.

(75) a. Wann hat (*nur) Hans was mitgebracht?
when has (only) Hans what brought
'What did only Hans bring when?'

b. Wen hat Tim/*niemand wann eingeladen?
who.Acc has Tim/nobody when invited
'Who did Tim/nobody invite when?'

As shown in (76), there is a clear contrast to E*wh*Qs with the same in-situ *wh*-phrase and the same intervener .

(76) a. A: Nur Hans hat Geranienquark zum Nachtisch mitgebracht.
only Hans has geranium quark for dessert brought
'Only Hans brought geranium quark for dessert.'

B: (?) Nur Hans hat WAS mitgebracht?
only Hans has what brought
'Only Hans brought WHAT?'

b. A: Niemand hat den Tim am St Rochustag eingeladen.
nobody has the.Acc Tim on the St Rochus day invited
'Nobody invited Tim on St. Rochus day.'

B: Niemand hat den Tim WANN eingeladen?
nobody has the.Acc Tim when invited
'Nobody invited Tim WHEN?'

The analysis of the ungrammatical (75) and related data in Beck (2006) is based on the uninterpretability of the structure in (77a).

(77) a. * [Q ... [only/nobody [... wh...]]] canonical *wh*-question
b. ok: [only/nobody .... [Q [wh]] ...] echo-*wh*-question

In (77a), the sister of 'only'/'nobody', has an undefined ordinary semantic value because *wh* has an undefined ordinary semantics. Before *Q* can come to the rescue, this leads to undefinedness when focus is evaluated at that point. This problem does not arise in (77b), the structure we propose for E*wh*Qs: the ordinary semantics of the sister of 'only'/'nobody' is well-defined because *Q* has already worked its miracle of shifting the alternative semantics to the level of ordinary meaning. Hence no intervention effect is predicted in E*wh*Qs.

5.2 Other echos

We have not attempted to provide an analysis of all things echo. In particular, we have set aside *yes-no* echo questions such as (78) despite their striking formal and interpretive similarities to E*wh*Qs (cf. the overview in Reis (2013)) that call for an integrated analysis of these two types.

(78) A: I have just planted 'Comte de Chambord'.
B: You have planted a PORTland rose? (/)

However, given the results of previous studies of *yes-no* echo questions (see especially Gunlogson (2003) and Poschmann (2015: ch.7)) we are confident that a compositional analysis that covers *yes-no* echo questions as well as their similarities (and differences) to E*wh*Qs is within reach.

Closer to home, in our analysis of E*wh*Qs we have almost exclusively concentrated on declarative-based E*wh*Qs. But what about E*wh*Qs with non-declarative structure, see (79) (partly repeated from (1)/(13))?

(79) a. Will Jane go WHERE? (/)
b. Down with WHAT? (/)
c. Call WHO? (/)
d. Who will cook WHAT? (/)

These E*wh*Qs certainly have a *wh*-question meaning of sorts, likewise an echo effect, and they also share the overt form properties sketched in section 2.1, so by this token a unified analysis seems called for. What makes us hesitate is the difference pointed out in section 2.2: Unlike declarative-based E*wh*Qs, E*wh*Qs with non-declarative structure cannot be content echoes pure and simple but must also obey a formal use condition: They require EUs with formally identical clause type features as illustrated in (19a,b) and (80).

(80) a. A: I wonder which unfortunate individual was told to prepare lentil souffle.
B: # Who will cook WHAT? (/)
a'. A: Who will cook lentil souffle?
B: √ Who will cook WHAT? (/)
b. A: You should definitely give the Dalai Lama a ring.
B: # Call WHO? (/)
b'. A: Call the Dalai Lama!
B: √ Call WHO? (/)

What motivates this difference is unclear, and so is how it affects our analysis. Being subject to such a strictly quotative condition, E*wh*Qs with non-declarative structure are on a par with E*wh*Qs containing deviant phrasal *wh*-insertion sites – be it irregular category slots or parts of words –, which require formal identity with the EU insertion frame, see (81a-c) (repeated from (23c-e)).

(81) a. E*wh*Q: The WHO is in town? (/)
possible EU to (a) e.g.: √The US president is in town.
impossible EUs to (a) e.g.: #Obama is in town.
#Michelle's husband is in town. / ...
b. E*wh*Q: They were at a WHAT-festivity? (/)
possible EU to (b) e.g.: √ When Tim and Sue went to a stag festivity, ..

impossible EUs to (b) e.g.: #They were at a stag party.

c. E*wh*Q: He has ornithoWHAT? (/)
possible EUs to (c): e.g.: √ He has ornithophobia.
impossible EUs to (c) e.g.: #He has a fear of birds.

Can E*wh*Qs with non-declarative structure be considered as clausally deviant *wh*-insertion sites – deviant that is in terms of regular grammar? Plausibly, yes: note that the E*wh*E *WHO* in (80b') outscoping an imperative does not yield an ordinary question meaning (a set of propositions); its semantics should come out a set of imperative meanings, and this is irregular. If so, one might speculate that the strictly local 'quotative' use conditions on these types of E*wh*Qs serve to license the use of irregular structures (see also notes 6,9 above) but at the moment, we simply lack the data to pursue the issue as systematically and cross-linguistically as one should. We leave this aspect of E*wh*Q analysis to further research.

5.3 E*wh*Qs cross-linguistically

Our analysis is developed specifically for English and German. This point is important because on the one hand, the structures E*wh*Qs employ should be generally permitted by the grammar of their language. On the other hand, they should depart from the structures of canonical *wh*-questions in their language in such a way as to mark them as echo *wh*-questions. What does this mean and what does it lead us to expect cross-linguistically?

To begin with a universal aspect, in order for us to consider a *wh*-question an echo question, the 'echo' condition of use needs to apply: the context provides a propositional alternative, *i.e.* an answer to the question. We suggest, then, that in E*wh*Qs cross-linguistically focus has to be on *wh* and that its effect is universally as in (82).

(82) $\text{Alt}(\text{wh}_F) = \{z\}$ (where z is the deictic/anaphoric alternative)

Here we come to a first point of possible variation: While in English and German focus is indicated (in particular) by stress, the same doesn't have to hold in other languages. That is, E*wh*Qs could be formally marked quite differently *e.g.* if the language uses mechanisms other than stress - say movement - to indicate focus.

A second point of possible variation concerns the *Q* operator. We propose for English and German that E*wh*Qs exceptionally use a phrasal *Q* operator while, uncontroversially, canonical *wh*-questions in both languages use a clausal *Q* operator. The phrasal *Q* operator is motivated by a dilemma created in E*wh*Qs: they are not interrogative sentences, hence have no clausal *Q*; but they do contain a *wh*-phrase, which needs a *Q* to be interpretable. Phrasal *Q* resolves this dilemma.

A possibility for cross-linguistic variation is introduced by the various ways in which a clausal *Q* operator can be formally marked. In English and German, clausal *Q* is made visible by overt movement of (exactly one) *wh*-phrase. In a language in which clausal *Q* is marked morphologically, this marking should be absent (or different) in E*wh*Qs. The Japanese question marker (*e.g. no)* can be seen as clausal *Q*. This marker is used in normal *wh*-questions, and we expect that it would not be used in (declarative-based) E*wh*Qs. This seems to be the case, cf. *e.g.* Sudo (2011: §3.3).

Another point of possible variation concerns languages that normally make use of a phrasal *Q*. What would be non-canonical here is not the presence of phrasal *Q,* but rather the *absence* of clausal *Q*. So whatever effects clausal *Q* in canonical *wh*-questions triggers in those languages should be absent in E*wh*Qs. In Tlingit, for instance (see Cable 2010) we might expect the phrasal *Q*-

particle *sa* to be present, but the *wh*-phrase to remain in situ (instead of being moved, as in ordinary *wh*-questions in Tlingit). A slightly different case is presented by Sinhala (Hagstrom 1998), where the *wh*-phrase is marked by a *Q* morpheme but according to Cable (2010) undergoes covert movement. Whatever movement effects can be observed for this covert movement (possible test cases include superiority and intervention effects) should be absent in the E*wh*Q counterparts of ordinary Sinhala *wh*-questions.

Given the above reasoning, we expect that in languages in which the grammar of focus and the grammar of *wh*-questions are essentially the same as in English and German, E*wh*Qs should also be constructed in an essentially parallel way (modulo orthogonal grammatical variation): the echo *wh*-phrase should not be subject to *wh*-movement (*contra* ordinary *wh*-phrases) and should have to bear main stress (again *contra* ordinary *wh*-phrases), and this on their *wh*-part if there is a choice. We are not at present aware of any counterexamples.

It is of course impossible for us to follow up on these predictions here. We offer them as an invitation to test the cross-linguistic predictions of our analysis and thereby our analysis itself.

5.4 Focusing Alt triggers

In this final subsection, we follow up on a semantically interesting aspect of the analysis of E*wh*Qs: In E*wh*Qs an expression is focused – *wh* – which is, without the focus, an alternative trigger anyway. We have seen that this makes E*wh*Qs special. In order for an alternative semantic value to be defined for them at all, the context needs to provide the lower-type deictic/anaphoric alternative (leading to the mismatched alternative set). Let us ask, first, what other cases of focused *wh*-phrases occur, and second, what other cases of focused alternative triggers we can think of.

5.4.1. Further examples of focus on wh-expressions

First, we emphasize once more that an alternative semantic analysis of questions does not entail that "the *wh*-phrase is inherently focused" or any such thing. The analysis of *wh*-questions is that *wh* triggers alternatives. What happens when you focus an alternative trigger is a separate issue. Our analysis of E*wh*Qs rests on this point. It is worth emphasizing this because the distinction is not always made (see also note 22 for discussion and references).

Let's consider other cases of a stressed *wh*-phrase as in (3); some additional examples are given in (83) (see also Eckardt (2007), Slade (2011) for such data; also the discussion in section 3.2).

(83) a. John only asked WHO was interviewed. ~> not what
b. I want to know WHERE the party is. ~> not when/ not with which band/…

Clearly what is focused here is the restrictor (person vs. thing, place vs. time) or perhaps some other participant in the event (cf. also Eckardt (2007)). It is never *wh* itself which is in focus. Semantically, a *wh*-expression like *who* needs to be decomposed into the part introducing the variable, *wh*, and a restrictor on this variable. So roughly, *who* corresponds to *which person*, *what* to *which non-person,* etc. This is sketched in (83'a). A proposal for how the *wh*-variable can be combined with a restrictor is found in Beck (2006) for *which*-phrases. Here we simply present the semantic outcome for the E*wh*Q in (83'b), the case of focus on *wh*, and for the ordinary *wh*-question in (83'c), the case of focus on the restriction.

(83') a. [who] = [wh human] "which person"
Who fell? = [Q wh human fell]
b. E*wh*Q: WHO fell?
$[[\text{ Q wh}_F \text{ human fell}]]_o$ = {x fell: x∈D and x is human}
$[[\text{ Q wh}_F \text{ human fell}]]_{Alt}$ = {z fell } (z the contextually relevant human in D)
c. ordinary *wh*-Q: WHO fell?
$[[\text{ Q wh human}_F \text{ fell}]]_o$ = {x fell: x∈D and x is human}
$[[\text{ Q wh human}_F \text{ fell}]]_{Alt}$ = {{x fell: x∈D and P(x)} | P an alternative to 'human'}

Thus stress, in such examples of focus on *wh*-expressions, indicates a different focus.[24]

To sum up, there seem to be no other instances of genuine focus on *wh* besides echo-*wh*-questions.

5.4.2. Focus on other alternative triggers

We now move away from questions and consider other examples in which an alternative trigger is focused. Two fairly uncontroversial examples of alternative triggers are disjunction (*e.g.* Aloni 2003) and NPIs (*e.g.* Krifka 1995). In (84) we give examples in which these expressions are focused.

(84) a. Nobody bought ANY vegetables.
b. Anne made rice OR beans.

No effect similar to E*wh*Qs arises. Focused disjunction can indicate a contrast to conjunction. Krifka (1995) considers stressed NPIs and proposes somewhat different licensing conditions (involving emphatic assertion instead of scalar assertion). At any rate, these data don't appear 'non-canonical' or 'echo'-ish.

However, there is an important difference between these alternative triggers and *wh*-phrases: In addition to triggering alternatives, NPIs and disjunction have a perfectly well-defined ordinary meaning. It seems that this gets used in their focus semantics. No particular complications arise, and hence the effect is hugely different from focused *wh*.

Thus, echo *wh*-questions turn out to be quite unique.

6. Conclusion

We propose an analysis of echo *wh*-questions as autonomous grammatical structures. Structurally and interpretively, they are within the range of expressions generated by the grammar. Nonetheless, important features of our analysis for E*wh*Qs in English and German are non-canonical with respect to their respective grammars:

- syntax of *Q*: a phrasal *Q* is involved, which German and English do not normally use
- semantic effect of phrasal *Q*: set of alternatives in the composition of $[[.]]_o$

[24] A more detailed discussion of (83'c)-type data and their analysis can be found in Slade (2011) (who (i) unfortunately misrepresents an alternative semantics for *wh* as *wh* bearing a focus feature, and (ii) does not distinguish between the *wh*-variable and its restrictor in his discussion of focus on *wh*-expressions). But he does offer a good analysis of the 'focus on the restrictor' examples).

- focus on *wh* and Alt(wh), 'mismatched' alternative set (i.e. the alternative semantic value is not a set of things of the type of the ordinary semantics)

The last point relates directly to their conditions of use. A propositional alternative has to be given, which is unusual for a question. This is what makes those questions 'echo' *wh*-questions.

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