Morphosyntactic cues of non-canonical questions: *wh*-in-situ questions

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1. Introduction

This chapter provides an inexhaustive overview of the morphosyntactic cues of non-canonical *wh*-in-situ questions in English and German. We begin by discussing how echo *wh*-questions (*EwhQ*s) and canonical *wh*-fronting questions (*whQ*s) differ in their formal properties. We then outline a recent explanation for the unique formal properties displayed by EwhQs from Beck & Reis 2018. Following this, we illustrate how (arguably) non-echoic non-canonical *wh*-in-situ questions, which we call *probe wh-questions* (*PwhQ*s), following Nguyen & Legendre (2020, 2022), differ in their formal properties from EwhQs, and briefly discuss how to extend an analysis such as Beck & Reis's to capture these differences, and whether it would be desirable to do so.

2. The morphosyntactic cues of echo *wh*-questions (EwhQs) in English and German

Speaker B's responses in (1) and (2) provide prototypical examples of (EwhQs) in English and German:

(1) A: He was eating a gobstopper at the time.
B: He was eating a what?

(2) A: Sie hatte eine Feuerzangenbowle zubereitet.
She had a fire-tongs-bowl prepared
'She'd prepared a *Feuerzangenbowle*.'

B: Sie hatte was zubereitet?
She had what prepared
'She'd prepared what?'

One way in which echo questions (EQs) are non-canonical is that they are dependent on the presence of an antecedent utterance that immediately precedes them in the discourse context. They establish an anaphoric relationship with this antecedent and are interpreted as 'echoing' it. For current purposes, it suffices to say that the 'echo effect' produced by an EwhQ consists in conveying the impression that the *wh*-expression (the *EwhE*) marks a gap the discourse that participants know has been closed before (Beck & Reis 2018:378).

EwhQs are formally delimited from other (non-)canonical *wh*-questions by the position of the nuclear pitch accent, which must align with the *wh*-variable of *wh*-word. For monosyllabic *wh*-words, this intonational pattern is indistinguishable from having the nuclear accent on the *wh*-word in a canonical whQ due to the presence of contrastive focus-marking on the *wh*-word

(compare the questions in (3)).[1] The prosody unique to EwhQs is revealed only when questions with a polysyllabic *wh*-word are compared, as in (4). Here, contrastive focus-marking on the whQ must apply to the entire *wh*-word (with prominence aligned with the final syllable), whereas the sentence accent must align with the *wh*-variable *wo* 'where' in the EwhQ.

(3) a. I know that Mary hired a student yesterday. What I want to know is:
Whích student did she hire yesterday? whQ

b. A: Mary hired the [mumble] student yesterday.
B: I didn't catch that—WHICH student did she hire yesterday? EwhQ

(4) a. Ich weiß, dáss Tom gegangen ist, aber nicht {wohín/*wóhin} er gegangen ist
I know that Tom gone is but not where-to he gone is
'I know that Tom went, but not where he went.' (whQ - Beck & Reis 2018:371)

b. Tom ging {WOhin / * woHIN}? (EwhQ - Beck & Reis 2018:372)

EQs come in two main types, *pseudo* and *true* (Sobin 1990, 2010). Pseudo EwhQs display all of the formal hallmarks of canonical whQs yet are intonated as EQs and induce the echo effect (ibid.), see (3b). True EwhQs are non-canonical *wh*-in-situ questions insofar as the EwhE does not undergo overt *wh*-movement to take wide scope, see (1), (2), and (4b). Because this chapter focuses on *wh*-in-situ questions, we henceforth mostly ignore pseudo EwhQs and use 'EwhQ' to refer solely to true EwhQs.

A final preliminary remark: there has been extensive debate concerning to what extent true EQs are metalinguistic / metarepresentative / quotative by nature (see e.g., Jacobs 1991, Reis 1992, 2012, 2016, Blakemore 1993, Noh 1998, Ginzburg & Sag 2000, Escandell-Vidal 2002, Fiengo 2007, Iwata 2003, Sudo 2010, Poschmann 2015, Beck & Reis 2018). For current purposes, we adopt the position that EwhQs are not inherently metalinguistic—that is to say, quotation is not required to derive the form and function of EwhQs—but that the EwhE can and sometimes must be interpreted as referring to a linguistic expression (i.e., a quote; an element of type *u*, Potts 2007) (Beck & Reis 2018, Griffiths et al. 2020). Examples will be presented shortly. Note that the fact that the EwhE in EwhQs can stand in for linguistic expressions is a morphosyntactic cue in itself, as *wh*-items in canonical whQs cannot perform this function.

A particularly conspicuous morphosyntactic cue of EwhQs is that their EwhEs can occupy syntactic positions that *wh*-words in whQs cannot. Specifically, *who* and *what* can occupy NP slots, and *what* can occupy certain verbal and clausal projections (5).

[1] In (3) and (4), the position of the nuclear accent in whQs is marked by an acute accent on the vowel of the syllable that bears the accent, whereas the position of the nuclear accent in EwhQs is marked by small caps. Following Beck & Reis 2018 and Biezma et al. 2021, we do not consider EQs to be associated with a fixed intonational contour: which combination of tones (and their relative pitch height) are used depends on a variety of independent, often expressive factors (see e.g., Oppenreider 1988:190, Repp & Rosin 2015). Sociolinguistic factors also play a role. For instance, Grabe et al. (2005) demonstrate that British English speakers use a variety of different contours when producing EQs, with the favoured variant varying from region to region.

(5) a. You're giving him a WHAT? / He knows the WHO? (Beck & Reis 2018:372)
b. He'll WHAT? / She thinks WHAT?
c. She WHATed with her WHAT?!??![2]

Function word positions are generally off limits for EwhEs (6) (Artstein 2002), unless the EwhE is interpreted metalinguistically, i.e., as standing in for a linguistic expression. In such cases, *what* replacing a function word is more tolerable (7).

(6) a. * She thinks WHAT he will come? (C^0)
b. * They WHAT been eating popcorn? (T^0 / $Perf^0$)
c. * He hides his money {WHAT / WHERE} his mattress? (P^0)

(7) A: She was sitting astride the chair.
B: ? She was sitting WHAT the chair?
(*Paraphrase:* what does 'astride' mean in A's utterance?)

When interpreted as standing in for a linguistic expression, *what* can also occupy subword slots (see Artstein 2002):[3]

(8) A: She's a neurooncologist.
B: Sorry, but—she's a neuro-WHAT-ologist?

Subword replacement is felicitous only when the replaced subword is present in the antecedent utterance (9). Note that this requirement for formal parallelism does not apply to EwhQs more generally, as the EwhQ in (10), which differs significantly in form to its antecedent, demonstrates.

(9) a. A: He has ornithophobia.
B: He has ornitho-WHAT?
b. A: He's got a fear of birds.
B: # He has ornitho-WHAT? (adapted from Beck & Reis 2018:380)

(10) A: Who would have thought that our son would do so well at MIT!?
B: Tom is now studying WHERE? (Beck & Reis 2018:376)

It should be stressed that the metalinguistic version of *what* cannot replace any linearly contiguous string—only morphosyntactic constituents can be replaced (11) (*contra* Janda

[2] From https://www.reddit.com/r/mildlyinteresting/comments/k1lsty/, accessed on 19 Dec 2023.

[3] An anonymous reviewer asks whether (8B) can be paragraphed as 'What does *-onc-* mean in A's utterance?'. According to Artstein (2002), the answer is 'no'. He proposes that the denotation of a focused syllable in a word *W* is the string it represents (an entity of type *e*) and that the remaining unfocused syllables in *W* denote a function from strings to semantic denotations. If this is correct, then (8B) is equivalent in meaning to the EwhQ 'she's a WHAT?'.

1985, Bolinger 1987, Sudo 2010).[4] This observation dovetails with recent analysis of mixed quotation as targeting only morphosyntactic constituents, not linear strings (Potts 2007, Maier 2014).

(11) A: Has John given the painting by Klimt to someone undeserving of it?
B: * Has John given the painting WHAT of it?
(where *what* replaces *by Klimt to someone undeserving*) (Griffiths et al. 2020)

Unlike whQs, EwhQs can display the morphosyntactic hallmarks of any clause type, including declaratives (e.g. (5)), canonical *wh*-questions (12a), polar questions (11), alternative questions (12b), imperatives (12c), and optatives (12d) (Sobin 1990, Huddleston 1994, Ginzburg & Sag 2001, among many others).

(12) a. Wen hat niemand WO gesehen?
Who has nobody where seen?
'Who did nobody see WHERE?' (Beck & Reis 2018:374)

b. A: Would you like bacon or a black pudding?
B: Would I like bacon or a WHAT pudding?

c. A: Ruf den Dalai Lama an!
Call the Dalai Lama PRT
'Call the Dalai Lama!'
B: Ruf WEN an?
Call who PRT
'Call WHO?'

d. A: If only he'd gone to Neverland!
B: If only he'd gone WHERE? (adapted from Beck & Reis 2018:374)

Like with subword replacement (see (9)), non-declarative EwhQs are deemed as pragmatically felicitous only when the immediately preceding utterance has the same non-declarative clause-typing syntax, as a comparison of the EwhQs in (12) and (13) demonstrates. The question of whether the presence of this restriction demonstrates that non-declarative EwhQ are (partly) metalinguistic in nature (just as the EwhE in subword-replacing EwhQs is) will be addressed in the next section.

(13) a. A: I'm asking if Dracula rang.
B: # Did WHO ring? (Griffiths et al. 2020:6)

b. A: You should definitely give the Dalai Lama a ring.
B: # Call WHO? (Beck & Reis 2018:402)

c. A: I wish that he'd gone to Neverland.
B: # If only he'd gone WHERE?

[4] Griffiths et al. 2020 demonstrate that the English data used by Janda (1985) and Bolinger (1987) to support the notion that nonconstituent strings can be targeted for *wh*-replacement in EwhQs contains confounds. Once these confounds are controlled for, *wh*-replacement of such strings is judged as unacceptable by native speakers.

Unlike *wh*-items in canonical whQs, EwhEs in EwhQs show no morphosyntactic cues associated with being *wh*-operators. For instance, *wh*-operators can only occupy positions from which (pied-piping) *wh*-movement could be initiated. In-situ *wh*-items in canonical multiple whQs are clearly *wh*-operators, as they cannot occupy positions from which *wh*-movement cannot be initiated (14). As shown already in (5), EwhEs **can** occupy such positions, which is indicative of their non-operator status.

(14) * Which student ate a what last night? — canonical multiple whQ
  a. * What$_1$ did a student eat [$_{DP}$ a t_1] last night? — no *wh*-movement from NP position
  b. * [A what]$_1$ did a student eat last night? — no pied-piping from NP position

Phrasal nodes that are strong island boundaries in whQs are not island boundaries in EwhQs (see Chernova 2014:§3 and references therein). This is illustrated in (15) to (17) for three types of island.

(15) **Coordinate structure constraint**
  a. * [What metal]$_1$ is Brass an alloy of [$_{ISLAND}$ copper and t_1]? — whQ
  b. Brass is an alloy of [$_{ISLAND}$ copper and WHAT]? — EwhQ

(16) **Left Branch condition**
  a. * [What colour brick]$_1$ did Dorothy follow [$_{ISLAND}$ a t_1 road]? — whQ
  b. Dorothy followed [$_{ISLAND}$ a WHAT colour brick road]? — EwhQ

(17) ***Wh*-island condition**
  a. * Who$_1$ is Chase wondering [$_{ISLAND}$ whether t_1 is trapped in the cave]? — whQ
  b. Chase is wondering [$_{ISLAND}$ whether WHO is trapped in the cave]? — EwhQ

Although this island-insensitivity hints towards the non-operator status of EwhEs, it does not confirm it, as in-situ *wh*-phrases in multiple whQs also display island-insensitivity; see (18) (Cheng & Demirdache 2010, Kotek 2016, 2019; *contra* Dayal 2002). Where EwhEs and in-situ *wh*-phrases in multiple whQs differ in terms of locality restrictions is regarding intervention. The multiple whQ in (19) demonstrates that unacceptability arises in German if a negatively quantified DP *niemand* 'nobody' (among other interveners) c-commands an in-situ *wh*-phrase and is c-commanded by the *wh*-phrase's target C_Q (Beck 2006). Such intervention effects do not arise in EwhQs, as (12a) has already shown.

(18) Which philosopher will be offended [$_{ISLAND}$ if we invite which linguist]?
  Possible answer: Quine, Chomsky and Lewis, Kayne.

(19) * Wen hat niemand wo gesehen?
  Who has nobody where seen?
  'Who did nobody see where?' (Beck 2006:4)

Wh-operators cannot be pronounced in SpecTP in English (Haider 2010), as the unacceptable multiple whQs in (20) demonstrate.[5] The observation that simplex EwhEs may occupy SpecTP in English EwhQs (21) provides further morphosyntactic evidence of their non-*wh*-operator status.

(20) a. * It's unclear who what shocked.
b. * Which student thinks that who ate the cake? (adapted from Haider 2010:115)

(21) a. A: It's unclear who the ostrich shocked.
B: It's unclear who WHAT shocked?
b. A: Which student thinks that Dracula ate the cake?
B: Which student thinks that WHO ate the cake?

Similarly, *how* and *why* cannot be pronounced in an in-situ position in English multiple whQs (22). Following Haider (2010), we assume that this restriction arises from problems with linking these manner / reason *wh*-operators to a C_Q head from the particular VP-adjunction position that they occupy in English. The fact that *how* and *why* are unproblematic as EwhEs (23) suggests that the number and/or distribution of Q operators differs in EwhQs (an idea that the analysis outlined in section 3 capitalizes on).

(22) a. * Who leaves why? / * Who lived how? (Haider 2010:119)
b. * I need to know who$_1$ how many people voted for t_1. (Pesetsky 1987:107)

(23) a. A: Who lived naked for three years?
B: Sorry, but — who lived HOW?
b. A: Sue needs to know who thirty million people voted for.
B: Sue needs to know who HOW many people voted for?

Table 1 summarizes the salient morphosyntactic cues of EwhQs discussed in this section.[6 / 7]

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[5] The complex *wh*-DP *which student* can licitly occupy SpecTP in (i) because the DP is not itself an *wh*-operator. Rather, a subconstituent of this DP, namely the interrogative determiner *which*, is the *wh*-operator.

(i) What did which student read?

It should also be mentioned that the unacceptability of configurations such as (20a) has also been explained by appeal to Chomsky's (1973) *superiority condition*; see in particular Pesetsky 1987, 2006.

[6] EwhEs in true EwhQs share only one relevant formal commonality with in-situ *wh*-phrases in canonical multiple *wh*-questions: neither can be modified by an aggressively non-D-linked expression (an ANDE), such as *the hell* (Brame 1978, Pesetsky 1987):

(i) a. Who (the hell) bought what? multiple whQ
b. Who bought what (*the hell)? multiple whQ

(ii) A: Bob hired Dracula as our new liaison officer.
a. B: I didn't catch that—WHO (the hell) did Bob hire? pseudo EwhQ
b. B: I didn't catch that—Bob hired WHO (*the hell)? true EwhQ

[7] Although this paper is restricted in scope to *wh*-in-situ questions in English and German, an anonymous reviewer requests that we provide some information about how EwhQs are formed in languages in which the *wh*-phrase remains in-situ in canonical whQs, such as Japanese, Turkish, or Korean. To fulfil this request, we mention two

Table 1. Morphosyntactic cues of EwhQs (when compared with whQs)		
Cue	**EwhQs**	**whQs**
nuclear accent alignment	always on the *wh*-variable of the *wh*-word	variable; dependent on independent information-structural factors
position occupied by EwhE	any lexical head / phrase, **or** any morphosyntactic constituent*	only positions from which (pied-piping) *wh*-movement is permitted
clause type	permitted in any clause type	only *wh*-interrogatives
syntactic islands	island insensitive	island sensitive
intervention effects?	no	yes
SpecTP (English only)	pronunciation of bare *wh*-item in SpecTP permitted	pronunciation of bare *wh*-item in SpecTP not permitted
in-situ *how* / *why* (English only)	permitted	not permitted

* the latter option is available only when the EwhE is interpreted metalinguistically

3. Explaining the exceptional morphosyntactic cues of EwhQs: Beck & Reis 2018

Beck & Reis (2018) offer an analysis of EwhQs which derives their semantic and pragmatic properties from their non-canonical form. They argue that the non-canonical form amounts to two properties: a phrasal Q operator and an obligatory focus on the *wh*-variable. The phrasal Q operator allows them to derive a *wh*-question meaning despite a non-canonical *wh*-question syntax. Obligatory focus on the *wh*-variable permits a pragmatic analysis that accounts for the echo quality of such questions.

We illustrate the semantics of a canonical *wh*-question in (24a) and (24b). The interrogative sentence in (24a) has the meaning in (24b): it denotes a set of propositions, namely the set of possible propositional answers to the question (Hamblin 1973).

(24) a. What did Tim buy?
b. {that Tim bought *x* | *x* a thing}

This meaning is derived from the structure in (25a). The structure contains the *wh*-phrase, which introduces alternatives into the composition, the set of alternative things in the example,

pertinent observations here. First, languages such as Japanese can (but need not) distinguish EwhQs from canonical whQs by adding a reportative complementizer to EwhQs (see (i)). Second, EwhQs in such languages show the same absence of locality effects as in English and German. For example, the CED effects (Huang 1982) displayed by canonical whQs are absent in EwhQs; see (ii) for example from Turkish.

(i) John-ga nani-o katta **tte**?
John-NOM what-ACC bought COMP
'John bought WHAT?' (adapted from Sudo 2010)

(ii) Ayşe [ISLAND hoca Mehmet-i nasıl azarla-dı diye] kız-dı? (× canonical whQ; ✓ EwhQ)
Ayşe teacher Mehmet-ACC how scold-PST COMP got.angry-PST
'Ayşe got angry because the teacher scolded Mehmet how?' (Güliz Güneş, pers. comm.)

(25b). The sister of the Q operator denotes a set of propositions derived on that basis, in the example propositions like ‘that Tim bought Balmoral’, ‘that Tim bought Windsor Castle’ and so on, (25c). The Q operator in (25d) shifts this set of propositions to the level of ordinary meaning: the semantics of the question is to open up a set of alternatives (which pragmatically a hearer will usually select the true ones from), (25e).

(25) a. $[_{CP}$ Q what$_1$ $[_{TP}$ Tim buy $t_1]]$
b. $[\![\text{what}]\!]_{Alt} = \{x \mid x \text{ is a thing}\}$ $[\![\text{what}]\!]_o$ is undefined
c. $[\![\text{what}_1 \text{ Tim buy } t_1]\!]_{Alt} = \{\text{that Tim bought } x \mid x \text{ a thing}\}$
d. $[\![\text{Q XP}]\!]_o = [\![\text{XP}]\!]_{Alt}$
e. $[\![\text{Q what}_1 \text{ Tim buy } t_1]\!]_o = \{\text{that Tim bought } x \mid x \text{ a thing}\}$

The structure of a canonical English whQ contains a clausal Q operator, i.e. a Q operator that, as in (25a), is attached at a clausal level. In addition to deriving the appropriate semantics of interrogative sentences, this operator plays a role in determining the properties of whQs—for example, enforcing *wh*-movement, meeting selectional restrictions in embedded *wh*-questions, and so on.

EwhQs share the basic semantics of *wh*-questions, but not their formal properties. Thus (26a) essentially contributes (26b); but there is no *wh*-movement, no question clause-typing, etc., (see Beck & Reis for details).

(26) a. Tim bought WHAT?!
b. {that Tim bought *x* | *x* a thing}

In order to derive a question semantics, a Q operator is required. It is the Q operator that allows expressions containing a *wh*-expression to have a well-defined semantics, see (25d). At the same time, a clausal Q operator would wrongly predict (26a) to share the formal properties of (24a). Beck & Reis propose to resolve this tension by assuming a phrasal Q operator, i.e. a Q operator that directly attaches to the echo *wh*-phrase, as in (27a). They show how the same semantic rules operative in (25) can derive the desired meaning for this structure as well. The result is (27b).

(27) a. $[_{CP}$ $[_{TP}$ Tim bought $[_{XP}$ Q [WHAT]]]]
b. $[\![$ $[_{CP}$ $[_{TP}$ Tim bought $[_{XP}$ Q [WHAT]]]] $]\!]_o$ = {that Tim bought *x* | *x* a thing}

But a phrasal Q operator is non-canonical in English. Beck & Reis argue that its presence has to be signalled by focus on the *wh*-variable, hence the distinctive accentuation alignment pattern of EwhQs; recall (3) and (4). Besides the accentuation pattern, focus on the *wh*-variable has interpretive effects as well. Following the standard focus semantics (Rooth 1985, 1992), focus, like *wh*-expressions, introduces alternatives into the calculation. (28) illustrates this informally.

(28) a. Tim bought [Balmoral]$_F$.
b. ⟦Balmoral$_F$⟧ = {Balmoral, Windsor Castle, …}
c. {that Tim bought Balmoral, that Tim bought Windsor Castle, …}

Returning to EwhEs: What does it mean to focus an expression whose interpretive purpose it is to introduce alternatives? Beck & Reis propose that focus on the *wh*-variable introduces one alternative into the calculation, namely the one (anaphorically or deictically) salient thing in the context that delivers an answer to the echo question. This is shown in (29).

(29) a. ⟦WHAT⟧$_{Alt}$ = {Balmoral, Windsor Castle, ...}
b. Alt(wh) = {*z*} (where *z* is the most salient thing in the context)
c. ⟦Q WHAT⟧$_o$ = {Balmoral, Windsor Castle, ...}
⟦Q WHAT⟧$_{Alt}$ = {*z*}
d. ⟦ [$_{CP}$ [$_{TP}$ Tim bought [$_{XP}$ Q [WHAT]]]] ⟧$_o$ = {that Tim bought *x* | *x* a thing}
= ⟦What did Tim buy?⟧
e. ⟦ [$_{CP}$ [$_{TP}$ Tim bought [$_{XP}$ Q [WHAT]]]] ⟧$_{Alt}$ = {that Tim bought *z*}

Focus has to be evaluated in the context. In a more standard case like (28), a licensing discourse context for the focus in (27a) could be question-answer congruence (i.e., (28a) is an appropriate answer to (25a)) or contrast (i.e., (28a) could be a response to the claim that Tim bought Windsor Castle). In the case of the EwhQ in (26) and the meanings in (29), focus is interpreted as contrast. Thus, it requires a context in which (29e) is given in the context (for some particular entity *z*). This derives the discourse conditions on EwhQs, cf. (30). In (30), the deictic/anaphoric alternative represented as *z* in (29) is Balmoral; *z* = Balmoral.

(30) A: Tim bought Balmoral.
B: Tim bought WHAT?!

The key assumption that the alternative to a focused *wh*-variable is its deictic or anaphoric alternative combines with standard assumptions about the pragmatic interpretation of focus to derive the echo effect already described in section 2, namely that an EQ is appropriate in contexts in which a particular answer to the question can be assumed to be given. In sum, the special echo pragmatics, and also the question semantics of EwhQs, can be derived from focus on the *wh*-variable and the phrasal Q operator licensed by this focus.

This focus-based analysis of EwhQs straightforwardly explains most of the morphosyntactic cues of EwhQs outlined in section 2. *Wh*-items cease to behave like operators once semantically combined with Q, and given that this merger occurs immediately in EwhQs (thanks to the presence of the phrasal Q operator), this explains why EwhE display none of the hallmarks of *wh*-operators: they can occupy positions from which *wh*-movement is impossible ((5) to (8)), they are insensitive to syntactic islands ((15) to (17)) and interveners (12), and they can be pronounced in SpecTP in English (21). If indeed *how* and *why* cannot appear in-situ in English multiple whQs because they cannot link to the clause-level Q operator from their particular VP-adjoined position, then Beck & Reis' proposal that every EwhE in an EwhQ is associated with its own unique phrasal Q operator explains why *how* and *why* can function

as in-situ EwhEs (23). Note also that Beck & Reis' analysis naturally extends from true EwhQs to pseudo EwhQs (*contra* Biezma et al. 2021: fn. 2) such as (1b), which is repeated below. Pseudo EwhQs simply involve F-marking on the *wh*-variable (which explains why pseudo EwhQs show the same nuclear accentuation pattern as true EwhQs) and a standard, clause-level Q operator as opposed to a phrasal one (which explains why the *wh*-phrase in a pseudo EwhQ displays all of the morphosyntactic hallmarks of being a standard, *wh*-operator).

(31) A: Mary hired the [mumble] student yesterday.
B: I didn't catch that—WHICH student did she hire yesterday?

It should be emphasized that the analysis briefly outlined above is purposely restricted to EwhQs with declarative syntax. Regarding non-declarative EwhQs (recall (11) and (12)), Beck & Reis (2018:403) speculate that these EwhQs are licensed only under formal parallelism with an antecedent utterance because posing a question with an irregular meaning—e.g., an imperative EwhQ denotes a set of imperative meanings and not a set of propositions, as questions normally do—must be motivated, and the presence in the discourse context of an antecedent utterance with a parallel form clearly provides the required motivation. Note that this reasoning extends to EwhQs whose EwhE stands in for a subword, which display the same licensing restriction (recall (9)).

Beck & Reis refrain from remarking about whether the formation and pragmatic licensing of non-declarative EwhQs involves quotation, i.e. recourse to linguistic expressions of type *u*. Proposals that advocate a quotative / metalinguistic / metarepresentative analysis of EwhQs in general and which would therefore be compatible with a quotative analysis of the so-called 'comp freezing' (Sobin 2010) effects exemplified in (11) and (12) include Jacobs 1991, Blakemore 1993, Noh 1998, Ginzburg & Sag 2000, Escandell-Vidal 2002, Iwata 2003, Fiengo 2007, and Sudo 2010. An alternative approach that makes no recourse to quotation is to assume that the licensing condition on EQs is calculated over the EQ's and its antecedent's LFs or some similar structured object (as opposed to their unstructured propositional meanings) and that these LFs include clause-typing operators (ASSERT, QUESTION, etc.) that must match. See Griffiths et al. 2020 for a preliminary implementation of this idea.

4. Non-echoic non-canonical *wh*-in-situ questions: Probe questions

Following Nguyen & Legendre (2020, 2022), we use the term *probe wh-question* (PwhQ) to refer to English and German *wh*-in-situ questions that appear not to establish a direct echoic relationship with the immediately preceding utterance in the discourse, but instead can be employed discourse-initially and which prompt the addressee for an answer (ibid.). PwhQs are commonly employed in quizzes and gameshows, in courtroom and classroom settings, in particular genres of the arts and entertainment (e.g., TV police procedurals), and in child directed questions (Bolinger 1957, 1978, Meibauer 1987, Reis 1992, Altmann 1993, Bartels 1999, Ginzburg & Sag 2001, Pires & Taylor 2007, Bobaljik & Wurmbrand 2015, Comyn 2013, Biezma 2020, Nguyen & Legendre 2020, 2022, among others). Illustrative examples from English are presented in (32). (For quiz questions in Japanese, see Hara, this volume.)

(32) a. Quizmaster: A tribute to one of his most acclaimed sketches, Ronnie Barker's Westminster Abbey memorial service began with the clergy being led in by servers bearing how many of what item? (Comyn 2013:44)[8]

b. District attorney: You were informed about this fact on what day?
(Bartels 1999:210)

c. Teacher: I need to know about displacements. They have a what?
2nd student: Distance.
Teacher: They have a fixed distance and fixed what?
3rd student: Direction.
Teacher: And fixed direction. Fixed distance and fixed direction. Kim, number three. Tell us what you have, Kim. A displacement of how many?
(*COCA*, Nguyen & Legendre 2022:4)

d. Wendell: We'll start an early deployment of 12,000 troops. The rest will follow as ready.
President Bartlet: Coming from where? (Biezma 2020:5)[9]

e. Mother: and he had a sister named what?
Child: Tony.
Mother: no, Tony was the little baby. His sister's name was what?
Child: [. . .] I don't know.
Mother: Her name is Sheila. (*Brown corpus*, Nguyen & Legendre 2022:4)

PwhQs share the commonality of being felicitous only in contexts in which the speakers and/or hearers are either obliged to know—or are at least subject to justifiably strong hearer / speaker expectations to know—the answer to the question (Beck & Reis 2018:10; cf. Ginzburg & Sag 2001, Reis 1992, 2012); compare the whQ and PwhQ in (33).[10]

(33) [*Context:* The speaker stops a random pedestrian on the street and says:]
a. Excuse me, where can I buy an Italian newspaper?
b. # Excuse me, I can buy an Italian newspaper where?
(adapted from Biezma 2020:18)

Beck & Reis propose that these felicity conditions are "just the echo effect projected" (p.379), which suggests that PwhQs do indeed establish an echo-like anaphoric relation with an antecedent (as EwhQs do), but that this antecedent is a pragmatically accommodated proposition, instead of an utterance. We illustrate this with example (34):

[8] From Comyn's (2013) corpus of questions posed on the long-running British quiz-show *University Challenge*.

[9] From the US political TV drama series *The West Wing* (series 7, episode 13).

[10] An anonymous reviewer suggests that questions such as (iB), which s/he calls 'follow-up' *wh*-questions, represent a third type of non-canonical *wh*-in-situ question, as they request new information (unlike EwhQs) yet cannot be used to initiate a discourse (unlike PwhQs). We contend that such questions are indeed PwhQs, as they place an increased degree of expectation on the hearer to know the answer to the question, just as PwhQs do. In our view, their inability to initiate a discourse stems from the fact they are introduced by *and*.

(i) A: I'm going to New York next week.
B: And you're going to do what?

(34) a. [Examiner A to student B:] Relativity was discovered by who?

b. Presupposition: The common ground CG entails {*w*: *z* discovered relativity in *w*} for some *z*. (Where the CG is the propositions accepted as true by A and B for the purposes of the conversation.)

c. Effect: A is suggesting that the answer to (34a) is already known by both A and B.

See also Biezma 2020 for an analysis along these lines that involves accommodated QUDs; see also Bolinger's 1957 'reminder questions', Bartels 1999, Pires & Taylor 2007. If the felicity conditions on PwhQs are indeed somewhat analogous to those on EwhQs, and if a strong causal connection obtains between felicity conditions on EwhQs and their exceptional formal properties, then one expects PwhQs display the same exceptional formal properties as EwhQs.

To a large extent, this expectation is met (cf. Pires & Taylor 2007). Analogously to EwhQs, one observes that the *wh*-expression in a probe question (a *PwhE*) may occupy a position from which overt *wh*-movement cannot be initiated (e.g., an NP slot; see (35)), that the PwhE is insensitive to syntactic islands (36), that simplex PwhEs can occupy SpecTP in English PwhQs (37), that PwhEs containing *how* and *why* are licit (38), that PwhEs must take utterance-level scope and are therefore unembeddable (39), and that PwhEs are not subject to intervention effects (40).[11]

(35) In *The Fellowship of the Ring*, Gandolf fights a what in the Mines of Moria?
(invented quiz Q)

(36) a. Brass is an alloy of [$_{\text{ISLAND}}$ copper and which other metal]?

b. Beethoven's *'Archduke' Trio* plays a prominent part in *Kafka on the Shore*, [$_{\text{ISLAND}}$ a 2002 work by which Japanese novelist, also noted for *Norwegian Wood*]?
(quiz Qs – Comyn 2013)

(37) In the famous play by Sophocles, Jocasta discovers that who is actually her son?
(invented quiz Q)

[11] Nguyen & Legendre (2020) claim that, in multiple PwhQs, the second *wh*-item shows hallmarks of undergoing covert *wh*-movement (unlike any *wh*-item in an EwhQ). The validity of this proposal is difficult to ascertain. For instance, Nguyen & Legendre claim that the second *wh*-item in PwhQs cannot be island-bound based on the difference in acceptability between examples such as (i) and (ii), yet do not obtain in their judgment experiment nor present from introspection ratings on multiple PwhQs in which the second *wh*-item is not island bound (as in (iii)). Without such providing this information, the possibility that (ii)'s degraded acceptability is caused by multiple PwhQs being generally harder to process than multiple EwhQs (due to the requirement to accommodate a complex antecedent for PwhQs) is not excluded.

(i) A: I know Mary bought cakes and candles.
B: You know WHO bought WHAT and candles?

(ii) ?* Now class, tell me *who* invented *what* and the light bulb?

(ii) Now class, tell me *who* invented *what* household appliance that illuminates our homes at night?

(38) a. Doctor: She was poisoned, by her own hand or someone else's.
Briscoe: And you know this how?
Doctor: Fresh needle mark on her left buttock.
[*Law & Order*, season 10, episode 23] (Bobaljik & Wurmbrand 2015)

b. Und diese Teilhaber erreichen wir wie?
and these partners reach we how
'And we can reach these partners how?'
[*Tatort*, episode 746] (Bobaljik & Wurmbrand 2015)

c. Ambrose: And you did this why? So that you could see what it is to die?
[*The Sinner*, season 3, episode 6]

(39) a. * Bill wonders Jill likes who. (Ginzburg & Sag 2001:281)
b. * He asked me your name is what.
c. * I wonder I should put this stuff where. (Bobaljik & Wurmbrand 2015)

(40) [Context: A courtroom setting. Because the witness is getting bogged down in contradictions, the judge backtracks:]
Und dann hat der Anwalt Sie gefragt, wen niemand wó gesehen hat?
and then has the lawyer you asked who nobody where seen has
'…and then the lawyer asked you who nobody saw where?'

We wish to mention two places where the properties of EwhQs and PwhQs diverge. As noted by Bobaljik & Wurmbrand (2015: fn. 3) and Beck & Reis (2018: fn. 10), there are no PwhQ analogues of the quotative-like EwhQs exemplified in (9), (11), and (12). In our view, this difference has a pragmatic source, not a grammatical one. Focusing momentarily only on the non-declarative EwhQ cases, recall from the previous section that Beck & Reis suggest that one requires good motivation for uttering a non-declarative EwhQ (due its irregular question meaning), and that sufficient motivation is provided only if it is clear from the discourse context that the EwhQ is echoing a matching non-declarative antecedent utterance. Assuming that this line of reasoning is correct, it therefore follows straightforwardly that there is (almost) never sufficient justification to utter a PwhQ, whose antecedent is pragmatically accommodated and therefore devoid of any linguistic form (Biezma 2020), in a non-declarative form. An advantage of this proposal is that it correctly predicts that non-declarative PwhQs are grammatical in a formal sense but require an exceptional context—such as the invented context presented in (41), where the form of the antecedent is well-known and quoted—to be licensed. The same argument extends to the (in)ability to replace subwords with PwhEs in PwhQs: the right context is rare in naturally-occurring speech but can be generated artificially; see (42).

(41) [Context: A *University Challenge* bonus round on the theme of Shakespeare soliloquies]
Quizmaster: Is this a what which I see before me, the handle toward my hand?
Contestant: A dagger.

(42) Quizmaster: DNA stands for deoxy-what-nucleic acid?
Contestant: Ribo.

Although the empirical picture is by no means clear, it appears that EwhQs and PwhQs can also differ regarding nuclear accent alignment. Recall from (3) and (4) that, in EwhQs, the nuclear accent must be aligned with the *wh*-variable part the EwhE. A cursory investigation of English quiz questions reveals that the same restriction does not hold for PwhQs. In the examples presented in (43), which come from a British gameshow (*The Chase*, series 4, episode 6),[12] the relevant pitch accents are denoted by acute accents on the vowel, and the word bearing the nuclear accent is boldfaced. One observes in (43a-b) that, although the *wh*-word receives a pitch accent, the nuclear accent aligns with rightmost item in the *wh*-phrase, following Cinque's (1993) *stress deepest* algorithm. Furthermore, in (43c-d), the *wh*-item bears no perceivable pitch accent, thus placing the prosodic profiles of these sentences in stark contrast with those of their EwhQ counterparts, in which the *wh*-item would bear the nuclear accent.

(43) a. The M69 motorway runs between whích twó **cíties**?
b. Tom Fletcher is the lead singer of whích **bóyband**?
c. *Wunderkind*, meaning child prodigy, comes from what **lánguage**?
d. Traditionally, oysters should only be eaten when which létter appéars in the mónth's **náme**?

From the scant evidence available, it appears that the same divergence in pitch accent alignment is possible in German: Reis (2016: fn. 32) notes that the PwhQs in (44), in which the pitch is not aligned with the *wh*-variable part of the *wh*-phrase, are acceptable. This paper's second author judges this prosodic profile as acceptable but dispreferred to the one in which the pitch accent is aligned with *wh*-variable (see (45)).[13]

(44) a. Und dafür kriegst du wie **víel**?
and there-for get you how much
'and for that you get how much?'
b. Und das opferst du wo**fűr**?
and that sacrifice you where-for
'and you're sacrificing that for what? (adapted from Reis 2016: fn. 32)

[12] https://www.youtube.com/watch?v=Pk9yBt33JpI, last accessed on 04 January 2024. The timestamps for the examples in (43) are 18:52, 22:29, 22:39, and 37:05, respectively.

[13] This paper's second author also considers the preferred prosodic profile of the (approximate) German versions of (43) (see below) to be that in which *wh*-word bears the nuclear pitch accent.

(i) Tom Fletcher ist der Sänger von **wél**cher band? 'Tom Fletcher is the singer from which band?'
(ii) Die A12 verbindet **wél**che beiden Städte? 'The A12 connects which two cities?'
(iii) Austern sollte man nicht essen in Monaten mit **wél**chem Buchstaben?
'One should not eat Oysters in months with which letters?'

(45) a. Und Brutus hat Caeser {**wó**mit / ? wo**mít**} getötet?
And Brutus has Caeser where-with where-with killed
'and Brutus killed Caeser with what?'

b. Star fighter greifen immer {**wó**her / ?? wo**hér**} an?
star fighters attack always where-from where-from PRT
'Star fighters always attack from where?'

In summary, it appears that, in both English and German, there is greater flexibility in pitch accent alignment in PwhQs than in EwhQs. This conclusion dovetails with the results of a recent production study on English by Biezma et al. (2021), who find a rising pitch accent on the *wh*-word (their stimuli involved only monoword EwhEs) less infrequency in PwhQs than in EwhQs.

The fact that EwhQs and PwhQs show almost identical morphosyntactic properties provides strong motivation for pursuing a unified analysis; see Meibauer 1987, Reis 1992, Bartels 1999, and Beck & Reis 2018 for suggestive remarks in this direction. Another reason to believe that a unified analysis might be achievable comes from the fact that two prominent recent semantic / pragmatic analyses of EwhQs and PwhQs (from Beck & Reis 2018 and Biezma 2020, respectively) utilize the same analytical tools, namely focus-semantic values and the discourse relations that can be established using them, to account for the non-canonical felicity conditions of on both question-types. If a unified 'focus-based' analysis is pursued, then some outstanding issues must be resolved. First, are these non-canonical questions interrogatives, as Beck & Reis' analysis of EwhQs claims, or declaratives, as Biezma's analysis of PwhQs claims (cf. Artstein's (2002) analysis of echo questions)? If these questions are declarative, precisely what differentiates them from semantically similar phenomena, such as assertions containing indefinite expressions, and what mechanism forces the *wh*-expression in these questions to take the widest scope (cf. Sudo 2010 for criticism of Artstein's 2002 focus-based approach to EwhQs)? Second, if the data in (43) to (45) are indeed reliable and representative of the empirical picture regarding the prosody of PwhQs (future research must confirm this; preliminary confirmation comes from Biezma et al. 2021), then more work is required to determine if Beck & Reis' analysis can be extended to PwhQs. In particular, one must assess the plausibility of ascribing the lack of nuclear pitch accent alignment with the F-marked *wh*-variable in PwhQs to an independent property of these questions, as decoupling nuclear pitch accent placement from F-marking the *wh*-variable in PwhQs but not EwhQs is required to viably extend Beck & Reis, at least in its current form.

5. Conclusion

Many of the morphosyntactic cues of non-canonical *wh*-in-situ questions in English and German, such as their insensitivity to syntactic islands and intervention effects, and also their ability to occupy otherwise illicit in-situ positions (in English), stem from their *wh*-expressions' status as a non-*wh*-operator. The ability of *wh*-expressions in echo *wh*-questions to stand in for linguistic expressions—i.e. to be interpreted metalinguistically—and for echo *wh*-questions to arise in a non-declarative form appears to be licensed by the tight discourse relation that echo questions establish with the utterance that they echo, which explains why other types of non-

canonical *wh*-in-situ questions (which we referred to collectively as *probe questions*), which often initiative sequences of discourse, are ordinarily unable to display these traits. The fact that echo and probe questions display many formal similarities and that both question-types appear amenable to a focus-semantic oriented analyses of their meaning and pragmatic function, give cause to be optimistic that a unified analysis of non-canonical *wh*-in-situ question can be achieved. Further empirical research of each subtype's similarities and differences, particularly on the phonology front, is required before more informed determination is possible, however.

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