

Monoclausal Question Word Coordinations Across Languages^{*}

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1. Introduction

It has been claimed (e.g. Gribanova (to appear)) that in questions with conjoined question words, or **question word coordinations** (QWCs), only multiple *wh*-fronting (MF) languages allow the coordination of argument phrases with different grammatical functions, see (1a) vs. (1b).

- | | | | |
|-----|-----|---|-------------------------|
| (1) | (a) | *Who and whom saw? | <i>English</i> , Non-MF |
| | (b) | Kto i kogo videl?
who and whom saw
'Who saw somebody and who was it?' | <i>Russian</i> , MF |

In this paper we explain this correlation and propose the following. (i) QWCs of *wh*-arguments are monoclausal; QWCs of an argument and an adjunct, and of adjuncts can be biclausal. In Non-MF-languages they always are. (ii) the structure of multiple *wh*-questions in MF languages is a necessary derivational stage in the derivation of monoclausal QWCs. (iii) this stage involves movement of the *wh*-phrases into multiple specifiers of FocP.

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2. Monoclausal QWCs in Multiple Fronting Languages

2.1 Proposal: Sideward Movement from FocP

Zhang (2007) argues that question word coordinations are derived by sideward movement (Nunes (2004)), which is an operation where an element is copied and merged with an unconnected syntactic object, which later is remerged with the source object. We follow this proposal here¹ but assume that sideward movement to &P cannot apply in all languages but must proceed from a structural configuration which can only be derived in MF languages. According to Bošković (1999), in MF languages multiple *wh*-words are moved overtly into multiple specifiers of FocP. This is illustrated for Russian in (2). We propose that it is from this position that the *wh*-phrases can be moved sideways to an unconnected syntactic object (we shall fine-tune this analysis in section 2.3). The derivation for the QWC in (1b) is given in (3).

(2) $[_{\text{FocP}} \text{ kto } [_{\text{FocP}} \text{ kogo Foc } [_{\text{TP}} \text{ kto videl kogo}]]]$

(3) *syntactic object 1*: $[_{\text{FocP}} \text{ kto } [_{\text{FocP}} \text{ kogo Foc } [_{\text{TP}} \text{ kto videl kogo}]]]$

syntactic object 2: $[_{\&\text{P}} \text{ kto } [_{\&\text{P}} \text{ i kogo}]]$

remerge: $[_{\text{FocP}} [_{\&\text{P}} \text{ kto } [_{\&\text{P}} \text{ i kogo}]] [_{\text{FocP}} \text{ kto } [_{\text{FocP}} \text{ kogo Foc } [_{\text{TP}} \text{ kto videl kogo}]]]]]$

In the coordination phrase, &P, the numeration indices of the *wh*-phrases percolate to the phrase level. On the one hand, this is conditioned by the requirement to derive a binary function at LF, which we assume is necessary to derive the reading QWCs have, viz. the single-pair reading, cf. the gloss in (1b). See section 5 for details. On the other hand, index percolation derives the c-command relations necessary for chain reduction of the lower copies of the *wh*-words at PF.

2.2 The Role of Focus

In our analysis we assume that the movement to multiple specifiers of FocP is a prerequisite for sideward movement. Why should focus matter? The first thing to be observed is that the coordination of unlikes is heavily restricted, which is illustrated for coordinations of an argument with an adjunct, and for the coordination of two different adjuncts in (4).

- (4) a. *John eats pork and at home.
b. *John met the woman he would marry in a drunken stupor and on a Wednesday.

¹ Citko (2008) raises a number of problems for a sideward movement account. They do not arise in the proposal we are making since we do not claim that all QWCs are derived by sideward movement. Sideward movement only is possible under very specific conditions.

Monoclausal Question Word Coordinations Across Languages

As (5) shows, however, if unlikes are focused, their coordination becomes possible. This is illustrated for focus associates of *only* in (5a) from Grosu (1984), and for clefted constituents in (5b), which coordinate the same phrases that could not be coordinated in (4).

- (5) a. John eats only pork and only at home.
b. It was in a drunken stupor and on a Wednesday that John met the woman he would marry.

(6) illustrates that in QWCs it is also possible to coordinate unlikes such as an argument and an adjunct. We argue that this is possible because they are focused.

- (6) Što i kogda ty podaril Marii? *Russian*
what and when you gave.present Mary.DAT
'What did you give to Mary as a present and when was it?'

However, for the coordination of *wh*-words, focus (in a semantic sense) is only a necessary but not a sufficient condition. There is the additional syntactic condition that the *wh*-words must move overtly to FocP. This condition is met in MF-languages but not in Non-MF-languages (compare Russian (1b) and (6) above with English (1a)). Let us look at this in more detail.

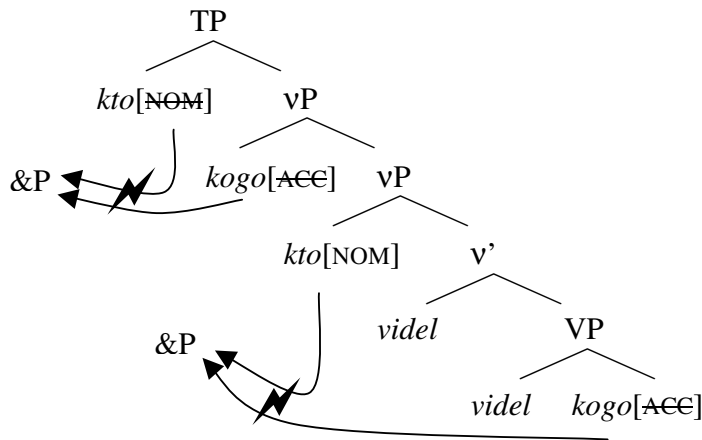
2.3 The Role of FocP

We assume that elements coordinated in a coordination phrase must be alike as far as their feature setup is concerned. For instance, they must not have incompatible case features. The reason for this, we argue, is that &P has case itself. In (7), &P triggers plural agreement on the verb: agreement is with the &P and not with the individual singular conjuncts. Hence, it is the &P which is assigned nominative case by T. Obviously, the case of the two conjuncts must be the same as the case of &P.

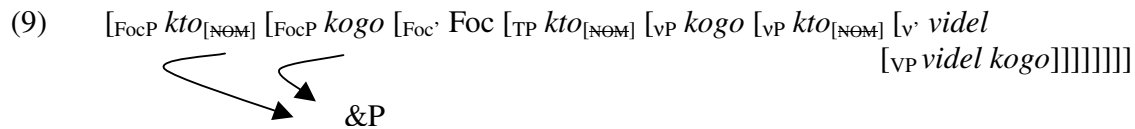
- (7) John and Pete are having dinner.

With this restriction on compatible case features in mind let us consider potential targets for sideward movement in the Russian QWC in (1b), cf. (8). We find that &P cannot be built from a copy of the specifier of vP (*kto*_[NOM]) and a copy of the complement of V (*kogo*_[ACC]) because both *wh*-phrases still have their – incompatible – case features: a feature is only erased upon merger of the next phase head; a feature that has only been checked is still visible and is incompatible with a distinct feature. For the same reason, a coordination of a copy of (*kto*_[NOM]) in Spec,TP and (*kogo*_[ACC]) in Spec,vP is impossible.

(8)



When Foc is merged, which, being the first head of the C-domain, is the next phase head, features checked in the vP phase are erased, and VP is spelled out. Erasure of the case feature on *kogo* removes the feature incompatibility:



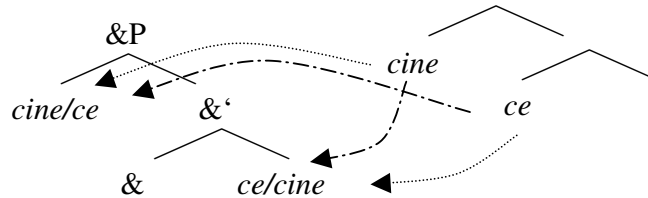
Sideward movement like any other movement must be triggered. What is the trigger for sideward movement in QWCs? The Foc head in MF languages has an *Attract All F* feature (Bošković 1999). Let us assume that the same holds for the coordination head. Motivation for this assumption comes inter alia from the observation that in German it is impossible for weak personal pronouns like *es* (which can be used to refer anaphorically to e.g. *das*_[NEUT] *Mädchen* ('the girl')), to occur in a coordination, see (10).

- (10) a. Er und sie gehen ins Kino. German
b. *Er und es gehen ins Kino.
he and she/it go in.the cinema
'He and she/*it are going to the cinema.'

Note that with the assumption that the coordination head has an *Attract All F* feature, movement from Spec,FocP to &P requires the checked F-features on the *wh*-words in Spec,FocP to be still active so they can be attracted by &. (11) is a derivation which avoids the problem that checked features remain active: the *wh*-phrases with [uF] are attracted simultaneously to Spec,FocP and to &P:

The difference between (12) and (13) is expected under our account.² As sideward movement is movement to an unconnected syntactic object there is no metric by which *cine* is a closer target for sideward movement to &P than *ce* and vice versa.

(14)



3. Non-Multiple-Fronting Languages

Let us move on to the question why Non-MF-languages like English do not have monoclausal QWCs, recall example (1a). In contrast to MF languages the Foc head in Non-MF-languages attracts only one *wh*-phrase. Hence, there is no successive-cyclic movement of an object *wh*-phrase to the left edge of vP, and further to FocP. Sideward movement cannot occur: the merger of the Foc head erases the offending case feature on the object *wh*-phrase in the complement position of V but also makes that phrase inaccessible for further syntactic operations: it is spelled out as part of the domain of the v phase.

Phase spell-out also accounts for data like (15), which is a control structure where two *wh*-phrases with the same case but from different phases are coordinated. (15) is ungrammatical.

(15) *Who and what did you convince to read?

Intended: 'Who did you convince to read something and what was it?'

The reason is that sideward movement to &P can only affect *wh*-phrases from the same phase: the conjunction head belongs to the same subnumeration as the elements merged in the syntactic object from which the conjoined *wh*-phrases are copied. Obviously, all

² Citko (2008) observes ordering restrictions in Polish QWCs, see (i).

- (i) a. Kiedy i ile Jan zjadł pączków?
when and how-many Jan ate doughnuts
'When and how many doughnuts did Jan eat?'

- b. *Ile i kiedy Jan zjadł pączków?

Intended: 'How many doughnuts did Jan eat and when was it?'

We tentatively assume that (i-a) is an instance of a biclausal QWC ('biclausal' in the sense discussed in section 6): the same ordering restriction can be found in German (without left branch extraction), which indicates that it arises as a consequence of the biclausal coordination rather than a monoclausal structure, which is not available in German because German is not a MF language.

elements from the same subnumeration must be merged in one syntactic object by completion of the phase.³

There are cases which seem to speak against the generalization that Non-MF-languages do not allow the coordination of *wh*-argument phrases, cf. (16) where an indirect *wh*-object seems to be coordinated with a direct *wh*-object. Comparison with (17), however, reveals that such coordinations are not possible in general.

- (16) ?Wem und was hast du gespendet? German
 who_{DAT} and what_{AKK} have you donated
 ‘Whom did you donate something and what was it?’
- (17) *Wem und was hast du vorgestellt?
 who_{DAT} and what_{AKK} have you shown
Intended: ‘Whom did you show something and what was it?’

The difference between the two examples is that in (16) the verb, *spenden* (‘donate’), can drop its direct object whereas the verb in (17), *vorstellen* (‘show’), cannot. This, we argue, is a clear indication that the structure in (16) is underlyingly biclausal. It is derived from the coordination given in (18a). (18b) illustrates that a corresponding biclausal structure is not available for (17), which is why (17) is ungrammatical.

- (18) a. ?Wem hast du gespendet und was hast du gespendet?
 b. *Wem hast du vorgestellt und was hast du vorgestellt?

4. Differences Within the Class of MF-languages

There are some interesting differences within the class of MF-languages which concern long-distance *wh*-dependencies. For Russian it has been observed that the conjoined *wh*-phrases do not need to be clause mates (Kazenin (2002)), see (19)⁴, whereas in Romanian, they do (Comorovski (1996)), see (20).

- (19) Kto i čto xočet, čtoby ja delal? Russian
 who and what wants that I did Kazenin (2002)
 ‘Who wants that I do something and what do they want that I do?’

³ The derivations we explore are different from those discussed by Nunes (2004), where sideward movement proceeds from a workspace built from one numeration to a workspace built from a different numeration so that the above question does not arise in Nunes (2004).

⁴ In the Russian example the embedded clause is in the subjunctive: the complementizer used is *čtoby* (‘that_{SUBJ}’) rather than *čto* (‘that_{IND}’), the verb occurs in the subjunctive form. The corresponding construction with an embedded indicative clause is ungrammatical. Importantly, *wh*-extraction from indicative clauses is generally excluded in Russian (cf. Stepanov 1998), i.e. it is not peculiar to QWCs.

- (20) ^{??}Cine și ce își închipuie că ai descoperit? Romanian
 who and what imagines that you.have discovered Comorovski (1996)
 ‘Who imagines that you have discovered something
 and what do they imagine that you have discovered?’

For Russian, we assume that the lower *wh*-phrase *čto* (‘what’) does not move via the specifier of the embedded FocP because Foc only is an attractor if it is selected by interrogative C.⁵ This is similar to assumptions in Chomsky (2005) where movement to Spec,T is triggered by a probe in C. Moreover, a very close relation between C and T in relation to focus is assumed by Miyagawa (2005), where a focus feature on C percolates down to T, where it triggers movement to Spec,TP. Now, with Foc not being an attractor, *čto* moves successive-cyclically through Spec,CP of the embedded clause, through Spec,VP of the matrix clause, and onwards to FocP of the matrix clause. This produces the necessary configuration for sideward movement.

In Romanian, in contrast, we assume that C and Foc have independent checking potential. The lower *wh*-phrase *ce* (‘what’) checks its F-feature as early as possible and therefore moves to the specifier of the embedded FocP. This in turn means that when *ce* moves higher its F-feature has already been checked, and, upon merger of the next higher phase head, the feature is erased. Sideward movement cannot apply because the coordination head cannot attract *ce*. This is why the two *wh*-phrases in a Romanian QWC have to be clause mates. For *wh*-movement to the matrix Spec,CP in non-coordinated multiple questions the erasure of the F-feature on the long-distance moved *wh*-phrase is unproblematic because movement to Spec,CP is driven by the *wh*-feature.⁶ The [uF]-feature can be checked in the lower clause without any problematic consequences for the matrix clause. Therefore, the *wh*-phrases in multiple questions do not need to be clause mates:

- (21) Cine ce își închipuie că ai descoperit? Comorovski (1996)
 who what imagines that you.have discovered
 ‘Who imagines that you have discovered what?’

Evidence for the early checking of the F-feature, i.e. the checking of the F-feature on the lower *wh*-phrase in the embedded clause comes from languages like Gurune, a Niger-Congo language, and a number of Bantu and Chadic languages. (22) is a Gurune matrix question, where the *wh*-phrase remains in the FocP of the embedded clause. Notice the focus particle *ta* following the *wh*-word *ani* (‘who’).

⁵ Jason Merchant (p.c.) points out an interesting alternative: it might be the case that subjunctive C (see note 4) does not select for FocP, i.e. subjunctives have a reduced left-peripheral domain. This needs further investigation. Subjunctives are usually assumed to have a defective T but it is unclear what consequences this has for the C system.

⁶ Contra Bošković (2002) we assume that the interrogative complementizer in Romanian can attract all *wh*-elements in the clause. This requires a more involved discussion we cannot provide here.

- (22) Fu tiense ani ta Adongo zãã nye? *Gurune*
 you think who FOC Adongo yesterday saw
 ‘Who do you think Adongo saw yesterday?’

The difference with Romanian is that C[+Q] in Gurune does not have an EPP-feature and thus does not attract the *wh*-word. Similarly, in Serbo-Croatian, which is a MF-language, a *wh*-phrase can stay in the embedded clause (Rudin (1988)), presumably in Spec,FocP:

- (23) Ko želite da vam šta kupi? *Serbo-Croatian*
 who want-2p that you what buys Rudin (1988)
 ‘Who do you want to buy you what?’

Next consider Greek. Greek is not usually taken to be an MF-language. In multiple *wh*-questions like (24), the subject *wh*-phrase precedes the verb whereas the object *wh*-phrase follows it. Still, Greek has QWCs with argument phrases, see (25).⁷

- (24) Pjos agorase ti? *Greek*
 who bought what
 ‘Who bought what?’

- (25) Kséro pjos ce ti píre.
 I.know who and what took
 ‘I know who took something and what he took.’

Now, Sinopoulou (2008) argues that the lower *wh*-phrase in Greek multiple questions, which seems to be in situ in (24), moves to a focus position above the subject phrase:

- (26) Pote agorase ti o Petros?
 when bought what_{ACC} the Peter_{NOM}
 ‘When did Peter buy what?’

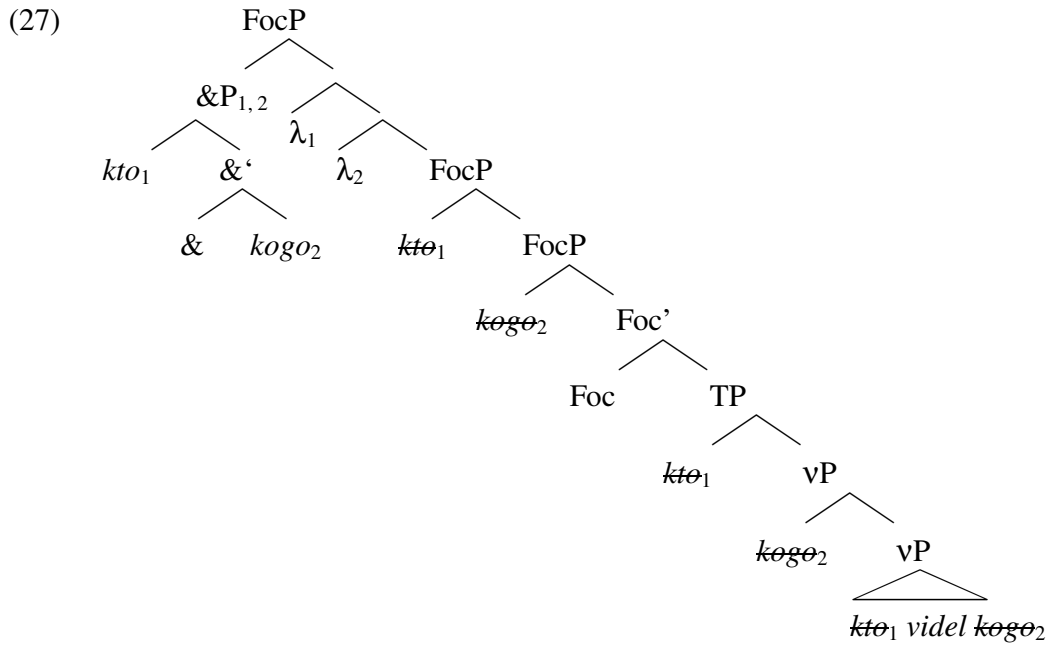
We follow this proposal here and assume furthermore that the higher *wh*-phrase also moves to Spec,FocP. Thus, Greek has the MF-property that is necessary for sideward movement to &P.

5. The Semantics of Monoclausal QWCs

With Haida (2007) we argue that contrary to standard assumptions, the pair-list reading of multiple questions does not require a special syntactic and semantic operation (‘absorption’, Higginbotham & May (1981); also see Gribanova (to appear) for ‘absorption’ in the context of QWCs). The pair-list reading already follows from the standard seman-

⁷ Jason Merchant informs us that these data are not accepted by all speakers. The informants we consulted gave us judgements like the one above for contexts that clearly support a single-pair reading.

tic accounts of multiple questions: according to Karttunen (1977), and Groenendijk & Stokhof (1982) a multiple question essentially denotes a list of propositions, which contain the answer pairs. Additional presuppositions like the sorting key characteristic can be derived without absorption (for details see Haida 2007). As a matter of fact, it is the single-pair reading that requires a proximity between the two *wh*-phrases. It requires the formation of a generalized relation, which must be exhaustivized, see below. The argument of a generalized relation must of course be a binary function. This is why the indices of the *wh*-phrases within &P must percolate up to the phrase level: at LF the two indices trigger the syntactic insertion of two λ -operators that yield the binary function (cf. Heim & Kratzer (1998)).



Let us illustrate the exhaustivization of the relation. (28a) gives the standard denotation of *wh*-pronouns, which is the same as the denotation of indefinite pronouns.⁸ (28b) is the denotation of the focus feature, which exhaustivizes the denotation of a generalized quantifier: it picks the maximal sum individual formed from the elements of the GQ (Haida (2007) following Szabolsci (1994)). Applied to a *wh*-pronoun the focus feature exhaustivizes the denotation of that *wh*-pronoun. This means that there is only one value that can be assigned to the existentially bound variable u_n , which is the maximal sum individual.

- (28) a. $\llbracket kton \rrbracket^j = \llbracket kgon \rrbracket^j = \lambda P. \exists u_n. P(j)(u_n)$
 b. $\llbracket F \rrbracket^j = \lambda Q \lambda P. Q(j)(\lambda j \lambda v' (v' = \sigma v. P(j)(v)))$
 c. $\llbracket kton^F \rrbracket^j = \llbracket kgon^F \rrbracket^j = \llbracket F \rrbracket^j (\lambda j \lambda P. \exists u_n. P(j)(u_n)) = \lambda P. \exists u_n (u_n = \sigma v. P(j)(v))$

The standard denotation of the conjunction *and* (Russian *i*) for the coordination of generalized quantifiers is given in (29a). The conjunction forms a generalized relation from

⁸ The existential quantifier here is dynamic, see Haida (2007, to appear).

Monoclausal Question Word Coordinations Across Languages

two generalized quantifiers: it pairs every set in the first GQ with every set in the second GQ by forming the Cartesian product of the elements of one set with those of the other. The denotation of the &P: *kto i kogo* is given in (29b). Since the *wh*-pronouns *kto* and *kogo* are exhaustivized – they are focused – the &P denotes a generalized relation of single pairs.

- (29) a. $\llbracket i \rrbracket^j = \lambda Q \lambda Q' \lambda R (Q'(j)(\lambda j \lambda v. \exists v'. R(j)(v, v')) \wedge Q(j)(\lambda j \lambda v'. \exists v. R(j)(v, v')))$
 b. $\llbracket [kto_1^F [i kogo_2^F]] \rrbracket^j$
 $= \lambda R (\exists u_1 (u_1 = \sigma v. \exists v'. R(j)(v, v')) \wedge \exists u_2 (u_2 = \sigma v'. \exists v. R(j)(v, v')))$

6. Biclausal QWCs

In the introduction we suggested that QWCs in Non-MF-languages are underlyingly biclausal. This is illustrated for an English example in (30), where the ellipsis site is marked by strikethrough.

- (30) Where ~~does Peter spend his Sundays~~ and with whom does Peter spend his Sundays?

A biclausal analysis is required in any case for QWCs where it is not possible to form a binary operator from the conjoined question words, as is for instance the case in coordinations with *if* and a *wh*-phrase, see (31a). QWCs with certain conjunctions, e.g. *let alone*, for semantic reasons also require a biclausal analysis: in (31b) *let alone* scopes over the matrix predicate *know*.

- (31) a. The doctor wants to know if and when patient Miller ate his lunch.
 b. I don't know how, let alone why I should do that.

Russian, which, recall, is an MF language, also allows such structures:

- (32) Ne znaju kak ne govorja uže o tom za čem *Russian*
 not I.know how not speak already about that for what
 ja dolžen eto sdelat.
 I must that do
 'I don't know how let alone why I should do that.'

Thus, a biclausal analysis must be available in all languages (also cf. Gračanin-Yuksek (2007)).

Italian, which is generally assumed not to have multiple *wh*-interrogatives (Calabrese (1984); Zubizarreta (1998)), does have QWCs, see (33). This is highly suggestive of a biclausal analysis for Italian QWCs.

- (33) Quando e dove esci normalmente? *Italian*
 when and where eat.2ps.sing. normally
 'When and where do you eat normally?'

As for the actual analysis of biclausal QWCs we can only sketch some ideas here. Sentences like (31a) above have been argued by Giannakidou & Merchant (1998) to be derived by reverse sluicing⁹. We suggest here that a right node raising (RNR) analysis is more appropriate. The first argument for a RNR analysis is based on scope interactions. (34a) is a RNR structure and (34b) is a slightly abridged version without ellipsis (from Sabbagh (2007)). The sentences differ in their scope options. Whereas in the ellipsis construction the indefinite *some nurse* can scope over the universal *every patient (who was admitted last night)* and vice versa, the full clause coordination only allows wide scope of the indefinite over the universal. In other words, in RNR, an element that is elided (or right-node raised) can scope higher than in the non-elliptic variant.

- (34) a. Some nurse gave a flu shot to __, and administered a blood test for __, every patient who was admitted last night.
 $\exists > \forall, \forall > \exists$
 b. Some nurse gave a flu shot to every patient, and administered a blood test for every patient.
 $\exists > \forall, * \forall > \exists$

Similar effects can be observed in QWCs. In (35a) the universal cannot scope over the question operator *if*. Thus, the reading *Tell me for every guest if s/he arrived* is not available. In (35b) the universal can take scope over a *wh*-question word, cf. Moltmann & Szabolsci (1994) and Krifka (2001) for this observation. What is interesting now is that in the QWC in (35c), the universal can take scope over the conjoined question words: the sentence can have the reading *Tell me for every guest if and when s/he arrived*. The answer would be a list indicating for every guest if s/he arrived and if so, when s/he did.

- (35) a. Tell me if every guest arrived.
 $IF > \forall, * \forall > IF$
 b. Tell me when every guest arrived.
 $WHEN > \forall, \forall > WHEN$
 c. Tell me if and when every guest arrived.
 $IF \& WHEN > \forall, \forall > IF \& WHEN$

Thus, if we assume that the universal is elided¹⁰ in the first clause – like in RNR – the effects are absolutely parallel with the RNR case in (34a). Under a backward sluicing analysis, in contrast, these scope effects are unexpected.

⁹ For criticism of this view, see e.g. Gračanin-Yuksek (2007), Kazenin (2002), Liptak (2003). Other analyses do not subsume biclausal QWCs under one of the known ellipsis types but propose various sorts of structure sharing (e.g. Gračanin-Yuksek (2007), Citko (2008)). For reasons of space we cannot discuss these here.

¹⁰ We do not take RNR to involve deletion under identity here but rightward ATB-movement along the lines of Sabbagh (2007). Our specific proposal involves rightward ATB-movement of the TP, see Haida & Repp (2009).

Monoclausal Question Word Coordinations Across Languages

Further evidence against a backward sluicing analysis and for a RNR analysis comes from sentences like (36), where a non-interrogative complementizer is conjoined with a *wh*-word.

- (36) Paul is a clever little boy. Although he is only three years old –
he knows that, and why, the leaves change colour and fall off the trees in autumn.

For a reverse sluicing analysis, which (in most languages) is restricted to interrogative remnants, this is unexpected.¹¹ Right node raising is not restricted in the same way. Note in this connection that a monoclausal analysis for *that&wh* is ruled out *inter alia* for semantic reasons similar to those pointed out for *if&wh*.

7. Conclusion

We have argued that QWCs come in two varieties. They can be monoclausal or biclausal. We have proposed an analysis for monoclausal QWCs in terms of sideward movement of *wh*-phrases from Spec,FocP to &P, which explains the different behaviour of MF and non-MF languages in QWC, and accounts for differences within the class of MF languages. We have argued that some QWCs must receive a biclausal analysis independent of the language they occur in, mainly for semantic reasons. For these we tentatively assume a right node raising analysis.

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¹¹ Giannakidou & Merchant (1998) discuss a similar example which, however, is ungrammatical. They argue this to be due to the unavailability of reverse sluicing. (36) above is pragmatically well-controlled, which we think is the reason for the difference in grammaticality.

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