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Towards a New Typology of Coordinated Wh-Questions[1]

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ABSTRACT

In this paper, we develop a new typology of multiple wh-questions with coordinated wh-pronouns. We motivate the existence of three distinct structures for such questions: one mono-clausal and two bi-clausal. We use four kinds of diagnostics to determine which of the three structures is available in a particular language: the availability of both multiple wh-questions and wh-questions with coordinated wh-pronouns, coordination of two argument wh-phrases, transitivity restrictions and superiority effects.

KEYWORDS*:* coordinated multiple wh-questions, single-pair readings, pair-list readings, superiority, multidominance.

[1]To be added.

1. INTRODUCTION

In this paper we argue for a finer grained approach to the structure and interpretation of wh-questions with coordinated wh-pronouns, illustrated in (1a) with a Russian example. We refer to such questions as coordinated wh-questions (henceforth CWHs) to distinguish them from run-of-the-mill multiple wh-questions illustrated in (1b) (henceforth MWHs).[2] The two differ not only with respect to the presence vs. absence of the conjunction, but also with respect to interpretation; unlike MWHs, CWHs strongly favor single-pair readings.

(1) (a) **Čto** i **kogda** oni podarili? *Russian*
what and when they gave
'What and when did they give?'

(b) **Čto** **kogda** oni podarili?
what when they gave (Gribanova 2009:134)

CWHs differ from other instances of phrasal coordination in that the two (or more) coordinated wh-phrases can differ in syntactic category, allowing for the conjunction of, for example, an NP and an AdvP, as in (1a). This is a violation of the LAW OF COORDINATION OF LIKES, proposed by Williams (1981), and is normally not allowed, as Croatian (2) shows.

[2] Throughout the paper, we reserve the term MWH for multiple wh-questions that involve fronting of all wh-phrases.

(2) *Petar je vidio Marka i u srijedu. *Croatian*

Petar Aux.3.SG seen Marko.ACC and in Wednesday

Int: 'Petar saw Marko and on Wednesday.'

Moreover, in a number of languages, a CWH can contain two coordinated wh-arguments which bear different theta-roles, as shown in (3a). This too is disallowed in non-CWH constructions, as (3b) illustrates.

(3) (a) **Kto i kogo** udaril? *Russian*

who and whom hit

'Who and whom hit?' (Kazenin 2002: 1)

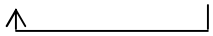
(b) *Udaril Vasja i Petju.

hit Vasja.NOM and Petja.ACC

Int: 'Vasja and Peter hit.' (Kazenin 2002: 2)

These considerations indicate that the fronted wh-phrases in a CWH are not coordinated in their base position. The derivation thus does not proceed as in (4).

(4) $[_{CP}\ [_{\&P}$ wh and wh$]_i\ [_{TP}\ \ldots\ t_i\ \ldots]]$



As a consequence, alternative ways of analyzing CWHs have been developed in the literature. Existing accounts of CWHs can be divided into two groups; those that propose a mono-clausal structure, like the one in (5a) (Zoerner 1995; Kazenin 2002; Skrabalova 2006; Zhang 2007; Gribanova 2009; among others) and those that propose a bi-clausal structure of the kind given in (5b) (Browne 1972;

Bánréti1992; Whitman 2002; among others).

(5) (a) $[_{CP}\,[_{\&P}\,wh_i$ and $wh_j]\,[_{TP}t_i \ldots.\, t_j]\,]$

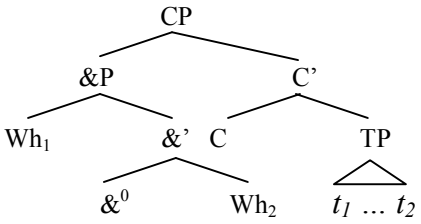
(b) $[_{\&P}[_{CP}\,wh_i\,[_{TP}t_i\,\ldots\,]$ and $[_{CP}\,wh_j\,[_{TP}\,\ldots\,t_j\,]]]$

In this paper, we argue against claims that CWHs are always mono-clausal or always bi-clausal. Our proposal draws on accounts advanced by Gračanin-Yuksek (2007) and Citko (in press). Gračanin-Yuksek (2007) examines CWHs in English and Croatian and argues that CWHs in English are always bi-clausal, while Croatian allows both mono-clausal and bi-clausal CWHs. Citko (in press) argues for two bi-clausal types for Polish CWHs. The proposal here combines the insights of both of these accounts, as it motivates the existence of three types of CWHs, one mono-clausal and two bi-clausal. This allows us to capture a wider range of crosslinguistic variation. We propose that there is no unique universal structure for CWHs and that their structure can vary not only cross-linguistically, but also within a single language. The idea that there are three types of CWHs allows us to capture the cross-linguistic distribution of CWHs, as well as the similarities (or the lack thereof) between CWHs and MWHs across languages. In the process, we argue against Gribanova's (2009) strictly mono-clausal account, which relates the existence of CWHs to the availability of multiple wh-fronting. We point out problems with this correlation, as well as with Gribanova's account of the differences in interpretation between CWHs and MWHs.

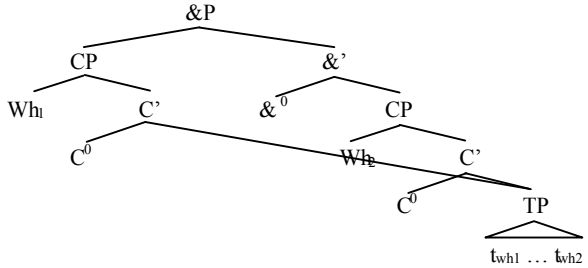
2. PROPOSAL: THREE TYPES OF CWHS

We argue that there exist three distinct types of CWHs, given in (6a–c) below, each yielding a different set of syntactic properties. We couch our proposal in minimalist terms; more specifically, in the so-called 'phase theory' of Chomsky (2000, 2001, 2004, 2007). We start with the final representations, and defer the discussion of the derivational details till later in this section.

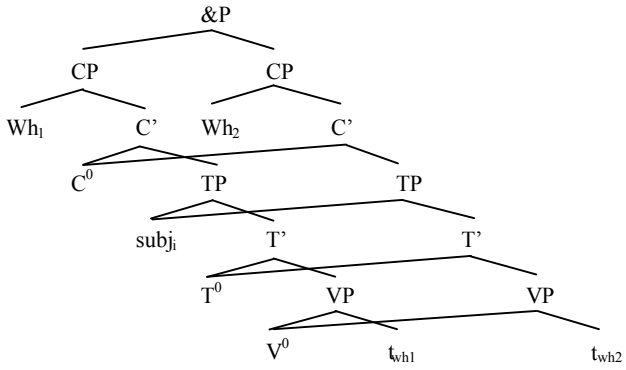
(6) (a) *Mono-clausal CWHs*



(b) *Bi-Clausal CWHs with Bulk Sharing*



(c) *Bi-Clausal CWHs with Non-Bulk Sharing*



Each of the three structures has been independently proposed. We depart from previous accounts in that we argue that in order to achieve descriptive adequacy, UNIVERSAL GRAMMAR has to allow all three types. The availability of a given structure in a language depends on independent factors, such as the availability of multiple wh-fronting. We link this property to the ability of C and *v* heads (the two heads involved in wh-extraction) to host multiple specifiers. We further argue that this is what limits the structures in (6a, b) to multiple wh-fronting languages.

The structure in (6a) is the mono-clausal structure argued for most recently by Gribanova (2009). Gribanova does not provide details of the derivation that results in (6a). A possible analysis might involve sideward movement (Nunes 2001, 2004), as proposed in Zhang (2007, 2009). Sideward movement is the kind of movement that takes place across two distinct tree structures BEFORE they are combined to form a single structure (as opposed to the UPWARD movement which takes place within a single rooted structure). On such an analysis, each wh-phrase in a CWH question moves sidewards first, to become part of the coordinate phrase, which is subsequently merged with the original structure. In section 2.2, we provide such a derivation in a step-by-step manner.[3]

[3]Zhang (2007) notes that conjoining a wh-phrase and a non-wh-phrase as well as conjoining two non-wh-phrases in this manner is not allowed, as shown in (i)-(ii).

(i) *How and the watermelon did John eat? (Zhang, 2007: ex. (33a))

(ii) *Cheerfully and the watermelon John ate. (Zhang, 2007: ex. (33b))

The remaining two structures, namely (6b, c), are bi-clausal but, crucially, do not involve backwards ellipsis of the kind argued for by Giannakidou & Merchant (1998), for example. On a backward ellipsis analysis, which Giannakidou & Merchant call 'reverse sluicing', the string in (3a) is derived as in (7), where the constituent following the wh-phrase in the first conjunct is deleted under identity with the relevant constituent in the second conjunct.[4]

(7) [[Kto$_i$ ~~udaril *pro*$_j$~~]i [kogo$_j$ *pro*$_i$ udaril t$_j$]] *Russian*

who hit and whom hit

This analysis has been criticized by Kazenin (2002) and Gribanova (2009) because it involves a cataphoric dependency between the wh-phrase (*kogo*) and a

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Zhang states that 'in order to check the uninterpretable feature of the attractor, the moved element may not contain any checking features with conflict values'. (2007: 2146) In a wh-conjunction, both conjuncts have the interpretable [Q] feature, while in this is not the case in (i). In (ii), on the other hand, 'the watermelon' may have [Topic] feature, but 'cheerfully' has [-Topic]' (2007: 2146). Thus, while the Law of Coordination of Likes can be obviated only through sidewards movement (which accounts for ungrammaticality of (2)), this possibility is subject to independent constraints.

[4] Giannakidou & Merchant (1998) argue for a reverse sluicing analysis of 'the apparent coordination of a wh-complementizer with a CP containing a wh-phrase in its specifier' (1998: 233). In footnote 2 (1998: 234), they note that their analysis naturally extends to cases of seeming adjunct-adjunct combinations, which are a subset of the cases we discuss. While we do not have anything new to say about the cases that include the string COMP AND WH, we argue that the cases that include the string WH AND WH) are not derived by reverse sluicing.

null pronominal in the first conjunct, which is not licensed in a structure like (7).

In our proposal, the bi-clausal structures in (6b, c) rely on the existence of multidominant structures, characterized by a single element being shared between two mother nodes. Our aim here is not to defend MULTIDOMINANCE (henceforth MD), but to merely point out ONE advantage of a grammar that allows it, thus adding to the growing body of empirical evidence in favor of such grammars. While we develop our proposal in minimalist terms, the issue of MD in the grammar is independent from the specifics of minimalism for two reasons. First, MD predates minimalism and second, MD is not limited to minimalism.[5]

While many existing MD proposals (especially the early ones) focus on coordinate structures, such as gapping or RIGHT-NODE RAISING (RNR)

[5] The particulars of the mechanisms used to generate MD structures will, of course, vary depending on the framework. In particular, derivational and representational approaches handle MD differently; derivational approaches assume the existence of some mechanism or operation responsible for deriving/building MD structures, such as PARALLEL MERGE of Citko 2000, BEHINDANCE MERGE of De Vries 2005, EXTERNAL REMERGE of De Vries 2009, GRAFTING of Van Riemsdijk 2006, SHARING of Gračanin-Yuksek 2007, NODE CONTRACTION of Chen Main 2006 or the union of phrase markers of Goodall 1987. In representational approaches, on the other hand, MD structures are more likely to be handled by modification of existing tree axioms or node admissibility conditions. This is the line taken by Williams (1978), for example, and the guiding intuition behind his treatment of coordination as simultaneous factorization (see also McCawley 1982 for related proposals).

(McCawley1982; Goodall 1983, 1987; Levine 1985; Muadz 1991; Moltmann 1992; Wilder 1999, 2008; among others), Across-the-Board (henceforth ATB) Questions (Williams 1978; Goodall 1983, 1987; Moltmann 1992; Citko 2000, 2003, 2005; among others), determiner sharing (Citko 2006; Kasai 2007), MD also figures in accounts of non-coordinate constructions, such as free relatives (Citko 1998, 2000; Huddelston & Pullum 2002; Van Riemsdijk 2006; Payne, Huddleston & Pullum 2007), parasitic gaps (Kasai 2007), serial verb constructions (Hiraiwa & Bodomo 2008), amalgams and parentheticals (McCawley 1982; Vries 2009; Heringa 2009).[6] [7] MD also features in other (not necessarily derivational) frameworks; Chen-Main (2006) argues for MD structures in Tree Adjoining Grammar, and Ojeda (1987) motivates their existence in the Generalized Phrase Structure Grammar.

In some of the models of the phrase structure that admit MD, it is conceived of as a general property of coordinate structures, which can also be represented as three-dimensional (Goodall 1983, 1987; Muadz 1991; Moltmann

[6] See Citko (2011a) and Citko (2011b) for more detailed arguments that these constructions are best analyzed in an MD way.

[7] Sampson 1975 is an example of an early MD proposal that does not deal with coordinate structures. He suggests a modification of the notion of phrase marker, which 'allows nodes to branch both upwards and downwards', resulting in MD representations (graphs which he dubs 'semitrees'), which he employs to analyze raising and control.

1992; among others), although in principle three-dimensionality is independent of MD, as discussed recently by Carnie (2008). The three-dimensionality is assumed in the work of De Vries (2003) and Heringa (2009), among others, at least for the treatment of coordination and parenthesis, if not for movement configurations. This brings us to a host of proposals that invoke MD to capture movement dependencies.[8] This is the main insight behind the PHRASE-LINKING GRAMMAR of Peters & Ritchie (1981) (see also Engdahl 1986; Blevins 1990, 1994; Gärtner 1999, 2002), where movement configurations are represented through a node being shared between at least two parents (a TREE PARENT and a LINK PARENT, such that the former dominates the latter), without assuming either that structures are three-dimensional, or that (this version of) MD is restricted to coordination.

Finally, Wescoat (2002), Huddleston & Pullum (2002), and Payne, Huddleston & Pullum (2007) employ MD to capture the fact that a single element may realize (or instantiate) several nodes/functions that are normally kept distinct. Wescoat proposes an MD account of words that seem to be associated with more than one mother node in the tree, as is the case of pronominal determiners such as *those* in the example below, which instantiates both a determiner and a noun.

(8) I've looked at **those**. (Wescoat 2002: 65: 2.1a)

[8] Again, MD is in principle independent from movement. While it is often used to capture displacement in the grammar, it has also been applied to constructions involving no movement whatsoever.

Wescoat, however, explicitly denies (2002: 13) the possibility of sharing above the level of the word. Huddleston & Pullum (2002), and Payne, Huddleston & Pullum (2007) propose that two functions (which they differentiate from syntactic categories) may undergo fusion so that a single category may realize both of them, and as such may have two mothers. On this view, for example, in items such as *someone* or *everybody*, which are referred to as COMPOUND DETERMINATIVES, the function of the determiner and the function of the head are fused. The exponent of the fused functions is the compound determinative, dominated simultaneously by the mothers of each function it realizes. Similarly, *once, twice,* and *thrice* are argued by these authors to be 'compounds of a determinative base (numerical *on, twi, thri*) and a noun base *-ce* (meaning "time")' (Payne, Huddleston & Pullum 2007: 588). This version of MD, although it abandons the SINGLE MOTHER CONDITION, still prohibits crossing branches, so the functions realized by a single (multiply dominated) category must be adjacent.

In our view, a multiply dominated item is not an instantiation of distinct categories/functions. Rather, it retains the category/function that it would have in a non-MD representation, but is associated with two simultaneous derivations.

All these approaches, including ours, share the belief that any syntactic structure has to be uniquely rooted, i.e. even though at some stage in the

derivation a structure might have more than one root, the final representation must satisfy the SINGLE ROOT CONDITION.[9]

In this paper, we assume that MD is not limited to coordinate structures, although nothing crucial hinges on this assumption (since the CWHs we analyze as multidominant do involve coordinate structures). We further assume, for concreteness, that a node comes to be multiply dominated by having undergone a process akin to PARALLEL MERGE of Citko (2005); two separate, but perhaps simultaneous instances of Merge, each resulting in a different mother. Each of the root nodes created by Parallel Merge participates in a separate derivation (subject to standardly assumed conditions that hold for these, such as Theta-role assignment, case-checking, locality considerations, etc.). Thus, in the absence of the evidence to the contrary, we assume that separate derivations which share one or more nodes proceed in exactly the same way they would if none of their constituents underwent Parallel Merge. At some point, the two roots must be united in order for the representation to satisfy the single root condition. In our case, the two derivations make up the conjuncts that end up united in a coordinate structure.[10] Related to our view of how the structure-building proceeds is the

[9] This is not true of all MD proposals. For example, in Riemsdijk's (2006) analysis of free relatives, the final structure may remain multiply rooted.

[10] Following Johannessen (1998), we assume the asymmetric coordination phrase (&P/ConjP), primarily for the purposes of linearization. However, our arguments for the three structures of

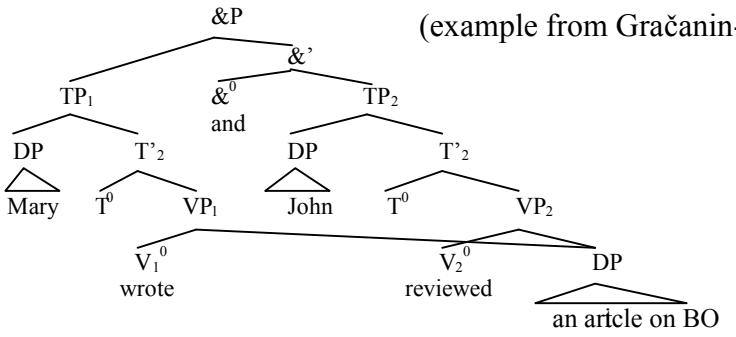
assumption that each conjunct is also interpreted separately before the meaning of the two is combined. This commits us to the view advanced by Goodall (1987) and explored in some detail in Gračanin-Yuksek (2007) that each conjunct in a coordinate structure must be well-formed in order for the conjunction to be well-formed. Finally, we distinguish between two kinds of MD or sharing. When the shared string forms a single constituent, we assume that Parallel Merge targets the minimal node that dominates the entire string. When, on the other hand, the shared string does not form a constituent, the structure contains more than one constituent that underwent Parallel Merge. Following Gračanin-Yuksek (2007), we refer to the former as BULK SHARING and to the latter as NON-BULK SHARING. As long as the shared string does not form a single constituent, i.e. when nodes are shared in a non-bulk manner, we assume that any number of nodes may be shared between the conjuncts (in a non-bulk manner). Bulk and non-bulk sharing are illustrated in (9) and (10) respectively.

CWHs in (6) are independent of the specific structure assumed for coordination, and hold equally well if we assume instead that coordinate structures are exocentric, as argued by Borsley (2003), for example. In that case, we need to assume a linearization algorithm that does not make reference to asymmetric c-command (perhaps along the lines of the tree-traversal based procedure proposed by De Vries 2009).

(9) Bulk sharing

(a) Mary wrote and John reviewed an article on Barack Obama.

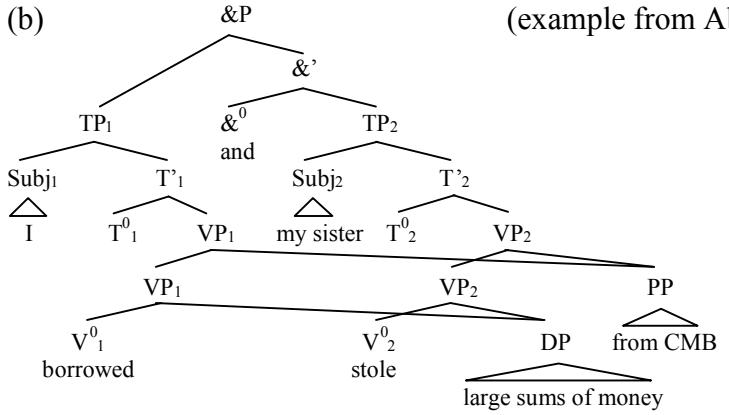
(example from Gračanin-Yuksek in press)



(10) Non-bulk sharing

(a) I borrowed and my sister stole large sums of money from the Chase Manhattan Bank.

(b) (example from Abbott (1976))



One of the major questions in the literature on MD concerns linearization; how are MD structures, in which a single element simultaneously occupies two distinct positions, mapped onto linear strings? Although this is not our primary concern here, we follow Wilder (1999, 2008) and Gračanin-Yuksek (in press), who propose an algorithm based on Kayne's (1994) LINEAR CORRESPONDENCE

AXIOM (LCA), which linearizes all the shared material (that has not undergone movement) to the right of the unshared material. It accomplishes this by making LCA sensitive to complete dominance, to distinguish multiply dominated nodes from non-multiply dominates ones.[11]

In our proposal, the crucial difference between the two types of MD representations lies in whether the wh-phrases are shared between the two CPs. In (6c), which features non-bulk sharing, wh-words are NEVER shared between the two CPs (while everything else in the structure is). In (6b), on the other hand, the two CPs bulk-share the entire TP, which means there IS a point in the derivation when the two wh-phrases belong to both CPs, even though in the final representation each wh-phrase occupies a specifier of a different CP.

In what follows, we support each of these structures. To establish what structure CWHs have in a given language, we use the following diagnostics: (i) the relationship between the availability of MWHs and CWHs in a language, (ii) the behavior of CWHs with respect to superiority effects, (iii) the grammaticality of CWHs with two argument wh-phrases (such as a subject and an object wh-

[11] A related question is what constrains possible MD representations. Citko (2005), Gračanin-Yuksek (in press), and Wilder (1999, 2008) argue that the relevant constraining factor is linearization. Gračanin-Yuksek (2007) proposes a filter, CONSTRAINT ON SHARING (COSH) that governs the distribution of shared and unshared nodes in a structure. The structures we propose are linearizable on Wilder's and Gračanin-Yuksek's algorithms, and do not violate COSH.

phrase), (iv) the possibility of obligatorily transitive verbs such as *buy* to appear in MIXED CWHs, i.e. CWHs in which one of the wh-phrases is a direct object and the other an adjunct. We will show that there is no correlation between the availability of MWHs and CWHs in a language, as there are languages without multiple wh-fronting that allow CWHs (English, Spanish, Greek, to name just a few). This is problematic for accounts that rely solely on a mono-clausal structure. We will also show that CWHs and MWHs within a single language can differ with respect to whether they obey superiority. For example, Romanian shows superiority effects in MWHs, but not in CWHs. Next, we will explain why in languages like English, mixed CWHs are possible only with optionally transitive verbs like *eat,* whereas in Slavic languages they are also fine with obligatorily transitive verbs like *devour.* Finally, we will explain why only some languages allow two coordinated argument wh-phrases. In the next three subsections, we discuss the three structures in detail, starting with the one in (6c).

2.1 *Bi-clausal CWHs with Non-Bulk Sharing*

This structure, proposed originally in Gračanin-Yuksek (2007), contains two interrogative CPs, which share everything EXCEPT the two wh-phrases. The two CPs are built in parallel, and they share a (number of) node(s). Finally, the two are conjoined under a single root. Given that wh-phrases are not shared, i.e. have not undergone Parallel Merge, a CWH with the structure in (6c) is derived by a

SINGLE instance of wh-movement per clause, thus making CWHs possible in languages without multiple wh-movement. We propose that this structure is the only one available for English CWHs. This captures the fact that CWHs are more restricted in English than in multiply fronting languages. First, two arguments (with different theta roles and different grammatical functions) cannot be conjoined in English, as shown in (11a). This is expected based on the structure in (6c), since a CWH consists of two CPs, each containing only one wh-phrase. Thus, the ungrammatical (11a) has as its source the equally ungrammatical (11b), in which there is a missing argument in each clause.

(11) (a) ***What** and **(to) whom** did John give?

(b) ***What** did John give and **(to) whom** did John give?

The same reason, as argued by Gračanin-Yuksek (2007), underlies the fact, pointed out by Whitman (2002), that for many speakers of English, mixed CWHs are possible with optionally transitive verbs *(eat* or *sing)*, but become ungrammatical with obligatorily transitive verbs *(devour* or *buy)*. This is shown by the contrast between the (a) and (b) examples in (12) and (13).[12]

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[12] In addition to English CHWs in which the object wh-phrase is optional in one of the conjuncts, such as the ones in (12) a) and (13a), Whitman discusses CWHs in which the NP-gap is obligatory (illustrated with corpus examples in (i), from Whitman 2002). In (ia) the gap is left by the object and in (ib) by the subject.

(i) (a) She was very concerned that she didn't know **how** or **what** to say.

(12) (a) **What** and **why** did you eat?

(b) ***What** and **why** did you devour?

(13) (a) **What** and **where** did you sing?

(b) ***What** and **where** did you buy?

The ungrammaticality of the (b) examples is due to the same factors that exclude (11a) above, namely the fact that the wh-object *what* is only part of one conjunct,

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http://www.sonlife.com/wwwboard/messages/43.html

(b) They have no way to know **when** or **which person** is busy […].

http://www.telesynergy.com/tele_faq.htm

Whitman notes that obligatory NP-gap sentences are much less acceptable to English speakers. In his study, there are seven informants who found optional NP-gap CWHs grammatical, but found obligatory NP-gap ones ungrammatical. Since these are also the intuitions shared by the speakers we polled, we focus in this paper on English CWHs with optional wh-phrases. We also abstract away from CWHs in which one of the coordinated elements is a complementizer *if* or *whether* (see also note 3 above), and examples, also from Whitman (2002), in which a wh-phrase is coordinated with a wh-determiner, illustrated below.

(ii) (a) How does CM control **when** and **whose** transmissions occur?

http://wind.lcs.mit.edu/talks/sigcomm99-cm/tsld008.htm

(b) [They have] no effect on determining **when** or **what type of symbols** will appear on the machine.

www.detnews.com/CASINO/columns/pilarski/0310/0310.htm

as shown in (14a–b), but is required by the verb in both conjuncts.[13]

(14) (a) ***What** did you devour and **why** did you devour?

(b) ***What** did you buy and **where** did you buy?

Moreover, since there is only one wh-phrase moving within each conjunct CP, no superiority-like effects are predicted to arise in CWHs of this type. And indeed, this is what we find; Whitman (2002) reports that with optional NP gaps, both orders of wh-phrases are grammatical, as shown in (15a–b).

(15) (a) **When** and **what** can I eat?

(b) **What** and **when** can I eat? (Whitman 2002:87)

In sum, the bi-clausal non-bulk sharing structure in (6c) can explain the existence of CWHs in English, a language that does not allow multiple wh-movement, as well as account for the properties that CWHs demonstrate in such a language.[14] In

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[13]A potential question that might arise here is whether the non-bulk sharing structure in (6c) can accommodate ditransitive (or polytransitive) verbs. We propose that CWHs in languages which do not have multiple wh-movement can only be derived from a bi-clausal structure in which a single wh-phrase moves per CP. However, this does not entail that there can be only one argument per VP. To illustrate, the CWH in (ii) below is probably derived from a bi-clausal structure in (i) (the bi-clausal non-bulk sharing structure in our terms).

(i) **What** did John sing to Mary and **why** did John sing to Mary?

(ii) **What** and **why** did John sing to Mary?

[14] One might ask what would exclude (6c) in a language. Dutch, for example, disallows CWHs of the English kind. We leave this issue for future research. One possibility would be to attribute the

the next section, we turn to the arguments for the mono-clausal structure in (6a).

2.2 *Mono-clausal CWH Questions*

According to the structure in (6a), the derivation of a CWH parallels the derivation of a MWH in that the movement of both wh-phrases is triggered by a single C head (see Merchant 2007; Gribanova 2009; Haida & Repp in press for different implementations of this idea). For concreteness, we follow Zhang (2007) and Haida & Repp (in press) and assume that (6a) is derived by sideward movement. The crucial steps in the derivation of the CWH in (16a) are given in (16b–e). After the TP *you eat what where* is constructed (as in (16b)), the wh-phrase *where* is copied and merged with the conjunction *and,* as shown in (16c). Next, the wh-phrase *what* does the same (as in (16d)). Finally, the entire conjunction phrase merges as the specifier of the CP, as shown in (16e).[15]

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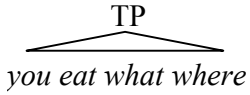
lack of such CWHs in a language to a ban on non-bulk sharing, which can be diagnosed by looking at the properties of gapping and determiner sharing (the other structures that would require non-bulk sharing).

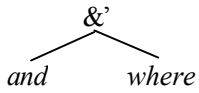
[15]Citko (in press) points out a potential problem for a sideward movement derivation, arising in ATB wh-questions with coordinated wh-phrases, such as *What and where did John cook and Mary eat?* The problem concerns the lack of the interpretation in which each wh-pronoun is extracted from a different conjunct (which could be paraphrased as *What did John cook and where did Mary eat?)*. This interpretation would be expected to be available on the sideward movement account. The problem does not arise for the simple cases we discuss here.

(16) (a) **What** and **where** did you eat?

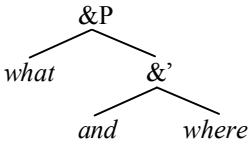
(b)



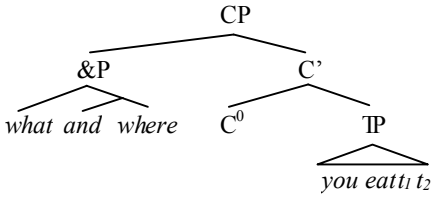
(c)



(d)



(e)



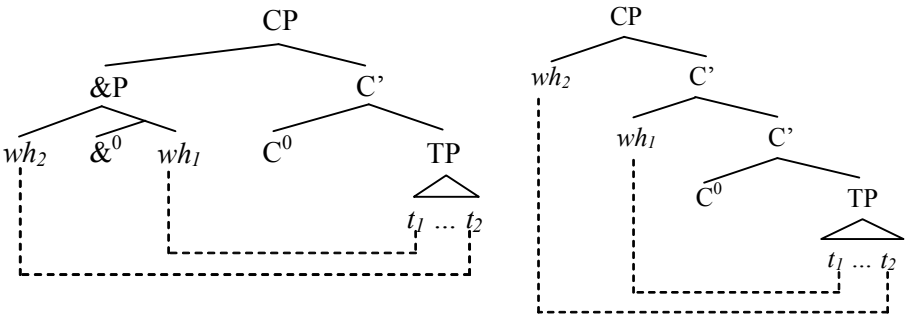
However, irrespective of the derivational details, the fact that in (6a) there is a single C head triggering movement in both CWH and MWH questions predicts that the two should be subject to the same restrictions.[16] [17] Here we test this

[16] It also predicts that languages that do not allow for multiple wh-movement will not have this structure at their disposal for deriving CWHs.

[17] Interestingly, in (6c) (the bi-clausal non-bulk sharing structure), movement of both wh-phrases is also triggered by a single C. The difference is that in (6c) each wh-phrase lands in the specifier of a different clause, while in (6a) there is only one specifier that hosts the &P. We follow Gračanin-Yuksek (2007) and assume that in languages without multiple wh-movement, there is a restriction not on how many wh-phrases C heads can attract, but on how many specifiers they can project per clause (see Gračanin-Yuksek 2007: 108 for further discussion).

prediction with respect to superiority effects. As first pointed out by Rudin (1988) and discussed subsequently by Richards (2001) and Bošković (2002), among many others, some multiple wh-fronting languages respect superiority while others do not. Bulgarian and Romanian belong to the former group, and Croatian/Serbian, Polish, Russian, and Czech to the latter. The structures in (17a–b) show that MWH and CWH violating superiority involve the same nested dependencies. If superiority is a result of nested (as opposed to crossing) paths, we predict that MWH and CWH should behave alike with respect to superiority.[18]

(17) (a) superiority violation in CWH (b) superiority violation in MWH



Indeed, there are languages that behave as expected. Bulgarian is such a language. It shows superiority effects in both MWHs and CWHs:[19]

[18] See Pesetsky (1982) for the original proposal about the role of crossing and nesting dependencies in superiority effects, and Richards (1997) for the development of this idea applied to languages with multiple wh-movement.

[19] Not all Bulgarian speakers find a contrast between (18a and (18b). Here, we focus on the dialect that does exhibit this contrast and hypothesize that the speakers that find (18b) acceptable allow

(18) (a) **Koj** **koga** ste si hodi v Bulgaria? *Bulgarian*

who when will REFL go in Bulgaria

'Who is going to Bulgaria when?'

(b) ***Koga** **koj** ste si hodi v Bulgaria?

when who will REFL go in Bulgaria

(19) (a) **Koj** **i** **koga** ste si hodi v Bulgaria? *Bulgarian*

who and when will REFL go in Bulgaria

'Who is going to Bulgaria and when?'

(b) ***Koga** **i** **koj** ste si hodi v Bulgaria?

when and who will REFL go in Bulgaria

However, in some circumstances, both orders are allowed as shown in (20–23).

(20) (a) **Kakvo** **koga** jade Ivan? *Bulgarian*

what when ate Ivan

'What did Ivan eat when?

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only the bi-clausal structures for CWHs. We also do not discuss here other factors that have been reported to influence the ordering of wh-phrases in Bulgarian CWHs, such as animacy effects, the unique status of the first wh-word as opposed to the second or third, or topicality (see Billings & Rudin 1996; Bošković 2002; Lambova 2003; Jaeger 2004; Dukova-Zheleva 2010; among many others, for further discussion), as these factors presumably remain constant in MWH and CWH, as we illustrate in (20-23).

(b) **Koga** **kakvo** jade Ivan?
when what ate Ivan
'When did Ivan eat what?'

(21) (a) **Kakvo** i **koga** jade Ivan? *Bulgarian*
what and when ate Ivan

(b) **Koga** i **kakvo** jade Ivan?
when and what ate Ivan

(22) (a) ?**Kakvo** **kogo** e spoletjalo? *Bulgarian*
what whom AUX stricken
'What struck whom?'

(b) **Kogo** **kakvo** e spoletjalo?
whom what AUX stricken (Billings & Rudin, 1996: 38)

(23) (a) ?**Kakvo** i **kogo** e spoletjalo? *Bulgarian*
what and whom AUX stricken
'What and whom struck?'

(b) **Kogo** i **kakvo** e spoletjalo?
whom and what AUX stricken

The issue of when we find superiority effects in Bulgarian (and when we do not), while interesting in itself, is not directly relevant for our purposes here. Relevant is the fact that we find the same ordering restrictions in both MWHs and CWHs.

This parallelism provides strong evidence that CWHs in Bulgarian are

derived by a strategy that is at work in MWHs, namely, multiple wh-movement. Further evidence in favor of a mono-clausal structure for Bulgarian CWHs comes from the grammaticality of mixed CWHs with obligatorily transitive verbs, as well as CWHs with two argument wh-phrases, as shown in (24a–b), respectively.

(24) (a) **Kakvo** i **kak** kupil Ivan? *Bulgarian*
what and how bought Ivan
'What and how did Ivan buy?'

(b) **Koj** i **kakvo** e kupil?
who and what AUX bought
'Who and what bought?' (Kliashchuk 2008: 6)

So far, we have looked at three kinds of diagnostics to determine whether a CWH has a mono- or a bi-clausal structure: the parallelism in superiority effects between CWHs and MWHs, the grammaticality of mixed CWHs with obligatorily transitive verbs, and the possibility of conjoining two arguments. We have seen a language in which CWHs show bi-clausal properties (English) and a language in which they show mono-clausal properties (Bulgarian). However, there are also languages, such as Romanian, in which CWHs show properties of the mono-clausal structure with respect to the possibility of conjoining two arguments and the use of an obligatorily transitive verb in a mixed CWH, but the superiority effects observed in MWHs do not obtain in CWHs. This is only compatible with the bi-clausal bulk sharing structure in (6b), which we discuss in the next section.

2.3 *Bi-clausal CWHs with Bulk Sharing*

We start by observing that Romanian allows mixed CWHs with an obligatorily transitive verb, as in (25a), and moreover, that both wh-phrases in a CWH can be arguments, as shown in (25b).[20]

(25) (a) **Cu ce** şi **pe cine** a supărat Ion? *Romanian*
with what and PE who has upset Ion
'With what and whom did Ion upset?'

(b) **Cui**$_i$ şi **ce** i-ai dat?
to.whom and what to.him you-have-given
'What did you give and to whom?' (Comorovski 1996:135)

This rules out the bi-clausal non-bulk sharing structure in (6c) as a possible source of the CWHs in (25) and points instead to a structure in which the two wh-phrases are clausemates. This leaves us with two options: the mono-clausal structure in (6a) and the bi-clausal bulk sharing structure in (6b). To decide between the two, we turn to superiority. Romanian MWHs and CWHs differ in this respect; the

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[20] The resumptive pronoun *i* 'to him' in (25b) is obligatory in all kinds of Romanian wh-questions involving the dative form *cui* of the wh-word *cine* 'who' (Grewendorf 2001). This is illustrated by a wh-question containing a single wh-pronoun in (i) from Vermaat (2003):

(i) *Cui*$_k$ *(i$_k$) ai răspuns?
to-whom to-him have-you answered
'Whom have you answered to?'

contrast between (26a, b) shows that MWHs show superiority effects, and the lack of a corresponding contrast between (27a, b) shows that CWHs do not.

(26) (a) **Cine**$_i$ **ce**$_j$ t_i a văzut t_j? *Romanian*

who what has seen

'Who saw what?'

(b) ***Ce**$_j$ **cine**$_i$ t_i a văzut t_j?

what who has seen (Comorovski 1996:2–3)

(27) (a) **Cine**$_i$ şi **ce**$_j$ t_i ti-a spus t_j? *Romanian*

who and what to-you-has told

'Who told you something and what was it?'

(b) **Ce**$_j$ şi **cine**$_i$ t_i ti-a spus t_j?

what and who to-you-has told (Comorovski 1996:135)

The puzzling behavior of Romanian CWHs is explained if we adopt the bi-clausal bulk sharing structure in (6b) of the kind proposed by Ratiu (2010).[21] In (6b), a CWH contains two CPs, which share the entire TP in bulk. Since in this structure, both CPs contain (traces of) both wh-phrases, it is not surprising that both wh-phrases in a CWH can be arguments of the same verb. On the other hand, there is only one instance of wh-movement per CP. Consequently, superiority effects are predicted not to arise.

[21] Citko (in press) proposes a variant of a bulk sharing structure for multiple wh-fronting languages of the Polish kind.

At this point a question arises as to what excludes the structure in (6b) in languages like English. We argue that it is the fact that English is not a multiple wh-movement language. The crucial difference between languages that do and do not exhibit multiple wh-fronting is whether their C can attract multiple wh-phrases (ATTRACT-ONE versus ATTRACT-ALL parameter proposed by Bošković (1997, 1998)). In terms we adopt here, an Attract-one C may project only a single specifier per clause, while an Attract-all C may project multiple specifiers per clause (see footnote 16). In Chomsky's phase theory (2000, 2001, 2004, 2007), which we assume here, it is not unreasonable to propose that the difference applies also to *v*. If in a language that does not have multiple wh-movement, an Attract-one *v* is embedded under two C's (as in our (6b)), the uninterpretable wh-feature on one C is bound to remain unchecked (and undeleted), since the wh-phrase not attracted to *v* remains inaccessible to C, given the PHASE IMPENETRABILITY CONDITION. A related question is what rules out the structure in (6b) in Bulgarian. If Bulgarian allowed it, it would allow violations of superiority, contrary to fact. At present we cannot account for this fact, and can only speculate that some form of economy might rule out CWHs involving bi-clausal structures of any sort in languages like Bulgarian. This might be a language-specific requirement that prefers MINIMAL STRUCTURE, thus precluding clausal coordination if a derivation containing phrasal coordination is available.[22]

[22] For different formulations of this constraint, see Bošković (1996), Grimshaw (1993), Law

Independent evidence, due to Ratiu (2010), in favor of such a bi-clausal structure for Romanian CWHs comes from the distribution of the interrogative particle *oare*. MWHs allow only a single occurrence of this particle, as shown in (28a), which suggests that only one *oare* is allowed per clause. CWHs, on the other hand, allow two occurrences of *oare* (as shown in (28b)), which follows straightforwardly from a bi-clausal structure.[23]

(28) (a) Oare **cine** (*oare) **ce** va spune? *Romanian*

OARE who OARE what AUX say

'Who will say what?'

(b) Oare **cine** si oare **ce** va spune?

OARE who and OARE what AUX say

'Who will say something and what will he say?' (Raţiu 2010:5)

At this point we might ask ourselves whether the structure in (6b) is the only structure available for Romanian CWHs. We argue that it is not. Rather, while superiority-violating CWHs are necessarily derived as in (6b), superiority-obeying ones are ambiguous between the structure in (6b) and the one in (6a). Support for this claim comes from Romanian CWHs with collective predicates.

(1991), and Speas (1994).

[23] Ratiu (in press) treats the particle *oare* as the head of the Finiteness Phrase inside the split CP.

Interestingly, in such CWHs, superiority effects re-emerge, as shown in (29).[24] [25]

(29) (a) **Cine** şi **cu** **cine** s-a intilnit? *Romanian*

who and prep. who REFL-AUX met

'Who met whom?'

[24] Even though the verb *meet* is different from more prototypical examples of collective predicates (such as *gather*) in that it allows (ia), contra (ib), the ungrammaticality of (24b) is due to the same factors that exclude (iia–b).

(i) (a) John met Mary.

(b) *John gathered Mary.

(ii) (a) ***Who** met and **with whom** met?

(b) ***Cine** s-a intilnit şi **cu** **cine** intilnit?

who REFL-AUX met and prep. who met

Lit: 'Who met and with whom met?'

[25] One of the reviewers suggests that the ungrammaticality of (29b) might be related to the contrast illustrated in (i–ii), which Bošković (2001) attributes to a phonological constraint against the repetition of two identical wh-phrases.

(i) **Ce** precede **ce**?

what precedes what

'What precedes what?'

(ii) ***Ce ce** precede?

what what precedes

'What precedes what?' (Niinuma 2010:162)

However, the two identical wh-phrases are not adjacent in either (29a) or (29b), which suggests to us that the ungrammaticality of (29b) is not due to the same phenomenon.

(b) ***Cu** **cine** şi **cine** s-a intilnit?
prep. who and who REFL-AUX met

The contrast between (27b) and (29b) indicates that the two do not have the same structure: the former involves a bi-clausal bulk sharing structure in (6b), and the latter a mono-clausal structure in (6a).[26] Example (29a) cannot be derived from a bi-clausal structure in (6b) because it contains a collective predicate, which seems to require the presence of all arguments that participate in the event to be contained in the same clause throughout the derivation. Given that the sentence is grammatical (and that it shows superiority), an alternative structure, namely the mono-clausal one in (6a), must also be available. Thus, Romanian seems to be a language with at least two structures for CWHs: a mono-clausal one in (6a) and a bi-clausal with bulk sharing in (6b).[27]

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[26] Chaves (2008) proposes an ellipsis analysis that accounts for peripheral omission of both phrasal and word-part material. Although Chaves does not discuss data from CWHs, his RIGHT PERIPHERAL ELLIPSIS (RPE) seemingly straightforwardly captures such examples as well. On such an account, the CWH in (12) receives the analysis in (i):

(i) **What**<~~did you eat~~> and **why** did you eat?

However, an ellipsis account has no natural way of explaining why Romanian CWH in (29) displays superiority effects, in contrast to the one in (27), given that morpho-phonological identity – a prerequisite for RPE to apply – holds in both.

[27] It is also possible that a superiority-obeying mixed CWH with an optionally transitive verb is ambiguous between all three structures.

A natural question to ask at this point is whether there are any languages in which all three structures in (6a–c) are available. We believe this is the case in languages like Russian, Polish or Croatian, which allow not only the coordination of two arguments in a CWH, but also mixed CWHs with obligatorily transitive verbs, and superiority violations in both CWHs and MWHs. With respect to superiority, these languages represent, in a sense, a mirror image of Bulgarian; both CWHs and MWHs allow superiority violations, as shown below for Russian.

(30) (a) **Kto** **čto** zaxvatil? *Russian*
who what grabbed
'Who grabbed what?'
(b) **Čto** **kto** zaxvatil?
what who grabbed (Gribanova 2009:135)

(31) (a) **Kto** i **čto** zaxvatil? *Russian*
who and what grabbed
'Who and what grabbed?'
(b) **Čto** i **kto** zaxvatil?
who and what grabbed (Gribanova 2009:136)

It is important to note that in (31a, b) both coordinated wh-phrases are arguments, which, as we saw in (11) above, is not possible in English. This is consistent with both the mono-clausal analysis in (6a) and the bi-clausal bulk-sharing one in (6b). In both structures, coordination of two argument wh-phrases is predicted to be

possible, and CWHs are predicted to show no superiority effects. This is indeed what we find. However, since in these languages MWHs do not show superiority effects either, it is not possible to tell whether the examples in (31) are derived from the structure in (6a) or the one in (6b).[28] Evidence that these languages, in addition to (6a) or (6b), also allow the bi-clausal structure in (6c) comes from the distribution of second position clitics in Croatian. As shown below, a CWH in Croatian may contain one or two (sets of) clitic(s). The presence of two auxiliary and interrogative clitics in (32a) indicates that the structure is bi-clausal, and that in each clause, the clitics follow the first constituent. The fact that the clitics are pronounced twice shows that they are not shared – if they were, we would expect the clitics to be pronounced only once, following all the unshared material, i.e. after both wh-phrases. Neither of these is attested in (32a). Instead, the two CPs share only the verb *jeo* 'eaten', which is pronounced following everything else in the sentence. Furthermore, under the assumption that auxiliary clitics originate in T^0 and subsequently move to a higher (second) position, the fact that (32a) contains two instances of *si* indicates that the structure contains two T^0 heads. This is only consistent with the bi-clausal structure in (6c).[29]

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[28] Not being aware of clear tests that might distinguish between (6a) and (6b) in languages like Polish or Croatian, we conclude that both structures are available.

[29] Example in (32a) shows that in a CWH with a bi-clausal non-bulk sharing structure more material than just wh-phrases may be unshared. This is also true in English, where (i) is acceptable

(32) (a) *Što* **li** **si** i *gdje* **li** **si** jeo? *Croatian*

what LI AUX.2SG and where LI AUX.2SG eaten

'What (on earth) and where (on earth) did you eat?'

(b) *Što* **li** **si** i *gdje* jeo?

what LI AUX.2SG and where eaten

'What (on earth) and where did you eat?'

The bi-clausal analysis of CWHs with repeated clitics is supported by the fact that, like in English, such CWHs are ill-formed with two argument wh-phrases, as shown in (33a). Also, a mixed CWH with repeated clitics cannot contain an obligatorily transitive verb, as in (33b):

(33) (a) **Što* **je** i *kome* **je** dao? *Croatian*

what AUX.3SG and whom AUX.3SG given

*'What and to whom did he give?'

(b) **Što* **si** i *gdje* **si** vidio?

what AUX.2SG and where AUX.2SG seen

*'What and where did you see?'

We can also show that some form of a bi-clausal structure must also be available for Polish CWHs. The evidence, due to Tomaszewicz (2010), involves high

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even though each CP contains an unshared subject and auxiliary, leaving only the verb *eat* in the sharing domain.

(i) *What* did Peter and *why* did Peter eat? (Gračanin-Yuksek 2007: 60)

speaker-oriented adverbs. The contrast between (34a) and (34b) shows that such adverbs cannot intervene between two wh-phrases in a MWH but can in a CWH.

(34) (a) **Kto* **najważniejsze** *co* powiedział? *Polish*
who most.importantly what said
'Who most importantly said what?'

(b) *Kto* i **najważniejsze** *co* powiedział?
who and most.importantly what said
'Who and most importantly what said?' (Tomaszewicz 2010:3)

2.4 *Interim Summary*

In the previous section we looked at three kinds of diagnostics to determine the structure of a CWH: the possibility of conjoining two arguments, the grammaticality of a mixed CWH with an obligatorily transitive verb, and superiority effects. Based on these, we saw evidence that the structure of CWHs can vary not only across languages but also within a single language. More specifically, we saw that English has only bi-clausal CWHs with non-bulk sharing whereas Bulgarian has only mono-clausal CWHs. We also saw that Romanian forms CWHs by at least two strategies: the mono-clausal one in (6a) and the bi-clausal one with bulk sharing in (6b). Finally, we saw that languages like Russian, Polish or Croatian may in principle have all three structures.

In the following sections, we discuss the consequences of the arguments

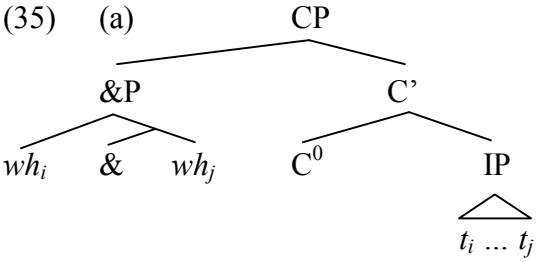
presented so far for the (mono-clausal) analysis of CWHs developed recently by Gribanova (2009). Gribanova argues that CWHs are always mono-clausal, and consequently, that their formation piggy backs on the formation of MWHs. We also point out data not discussed in previous sections, which lead us to conclude that mono-clausal CWHs are only a subset of possible CHWs across languages.

3. CHALLENGES TO GRIBANOVA'S (2009) ACCOUNT

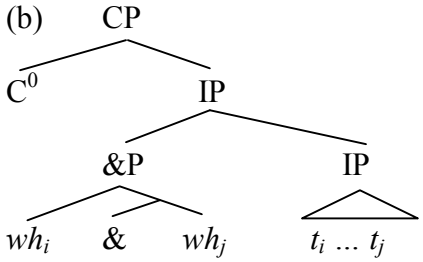
3.1 *Correlation between CWHs and Multiple Wh-Fronting*

Gribanova (2009) proposes two structures for CWHs, which mirror two independently motivated structures for MWHs (CP- versus IP-absorption structures of Richards (2001), who builds on Rudin's (1988) insights about two types of multiple fronting languages).[30]

(35) (a)



(b)



Such an analysis predicts that CWHs should only exist in multiply wh-fronting languages (Gribanova 2009: 138). In Section 2.1 above we already saw data from

[30] Gribanova does not discuss the details of the derivation, simply stating that the conjunction is merged as the derivation progresses, 'in conjunction with movement of each wh-phrase to the left periphery' (Gribanova 2009: 139).

English that argue against this claim. Corpus search also yields multiple examples of CWHs in English, a small sample of which is given below:

(36) (a) **What** and **where** is the Microsoft Office Button?

(http://office.microsoft.com/en-us/help/HA101828951033.aspx)

(b) **What** and **when** was The Surrender of the Appomattox Court House Battle?

(http://wiki.answers.com/Q/What_and_When_was_The_Surrender_of_the_Appomattox_Court_House_Battle)

(c) Study hints at **what** and **how** dinosaurs ate.

(http://www.livescience.com/animals/090629-dino-teeth.html)

Other non-multiple wh-fronting languages with CWHs reported in the literature are Spanish and Greek (discussed by Anagnostopoulou 2003; Whitman 2006; Sinopoulou 2009; Haida & Repp in press).

(37) (a) **Quién** y **dónde** vió a María? *Spanish*

who and where see.PRET Maria.ACC

'Who and where saw Maria?' (Whitman 2006:8)

(b) **Ti** ke **pou** tha spoudasi o Jiannis? *Greek*

what.ACC and where will study.3SG the Jannis.NOM

'What and where will John study? (Sinopoulou 2009:4)

While Gribanova has no natural way to accommodate the data from English, Spanish, and Greek, according to our account, all these languages have at their disposal at least the structure in (6c), involving two CPs that share

everything except the wh-phrases themselves. While we do not deny that there is a correlation between multiple wh-fronting and the availability of CERTAIN TYPES of CWHs, we conclude that the claim put forth in Gribanova (2009), that CWHs are impossible without multiple wh-fronting, is empirically untenable.

3.2 *Superiority Effects and Co-Occurrence Restrictions*

Gribanova's analysis predicts that the same restrictions (like the presence or absence of superiority effects) should apply to both MWHs and CWHs. We have already seen that this is not always the case. There exist languages like Romanian, which show superiority effects only in MWHs. If CWHs are derived by essentially the same mechanism as MWHs, this is unexpected. Our analysis, on the other hand, captures this discrepancy in the behavior of MWH and CWHs with respect to superiority effects by positing the availability of the bi-clausal bulk sharing structure in (6b) for Romanian CWHs.

A different challenge for Gribanova's account is observed in Croatian CWHs. The issue, however, involves not ordering – since in Croatian superiority effects are observed neither in MWHs nor in CWHs – but co-occurrence restrictions. In Croatian, sequences of wh-phrases that are possible in CWHs are different from those that are possible in MWHs. For example, as noted by Bošković (1998), two adjuncts cannot both be fronted in MWHs but are perfectly

fine in a CWH, as shown in (38).[31] Again, on Gribanova's account, the contrast between (38a, b) is unexpected: if the well-formedness of (38b) depends on the well-formedness of (38a), then (38b) should not be derivable, contrary to fact.

(38) (a) ***Gdje kada** Ivan nastupa? *Croatian*
where when Ivan performs
'Where does Ivan perform when?'

(b) **Gdje** i **kada** Ivan nastupa?
where and when Ivan performs
'Where and when does Ivan perform?'

As we noted in Section 2.3 above, CWHs in Croatian can have any of the three structures that we propose in (6a–c). Consequently, the derivation of (38b) is not necessarily related to that of (38a). Thus, although the ungrammaticality of (38a) remains mysterious, the well-formedness of (38b) is not – it is derived either as in (6b) or as in (6c), neither of which involves multiple wh-movement.[32]

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[31] Multiple wh-questions with two adjuncts are not generally impossible in Croatian. (38a) becomes grammatical if only one adjunct is fronted, as shown in (i). This crucially indicates that the problem lies in wh-*fronting* of two adjuncts.

(i) **Gdje** Ivan**kada** nastupa? PL/*SP
where Ivanwhen performs
'Where does Ivan perform when?'

[32]It is possible that *gdje* 'where' and *kada* 'when' are coordinated in their base positions and what is moved is the entire coordinate phrase. However, (38b) may contain repeated (sets of) clitic(s),

On the whole, then, our account is able to capture a wider range of data than previous accounts. In particular, it can account for the data that are not amenable to purely mono-clausal analyses. Furthermore, our account does not run into the problems that previous bi-clausal analyses have. As Kazenin (2002) and Gribanova (2009), among others point out, if (39a) is derived from (39b) via reverse sluicing (as proposed by Bánréti 1992; Browne 1972; and Giannakidou & Merchant 1998), the contrast between the CWH in (39a) and sluicing in (39c) is hard to account for. On our account, (39a) is a result either of the mono-clausal structure in (6a) or the bi-clausal structure with bulk sharing in (6b). On the other hand, the ungrammatical (39c) cannot be derived from (6a) given that on this analysis, there is no position inside the &P for the verb *zaxvatil* 'conquered', nor can it be derived from (6b), again because of the intervening verb, which being shared should be linearized to the right of all the unshared material. Finally, (39c) cannot be the result of sluicing, given the constraints on backwards anaphora, as suggested by Kazenin (2002) and Gribanova (2009).

(39) (a) **Kto** i **kakoj gorod** zaxvatil? *Russian*
who and which city conquered

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even the interrogative clitic *li*, indicating that the CWH may be derived by a bi-clausal strategy. Also, given Cinque's (1999) proposal about the hierarchy of adverbs, base position coordination is not likely.

(b) **Kto** zaxvatil i **kakoj gorod** zaxvatil?
who conquered and which city conquered

(c) ***Kto** zaxvatil i **kakoj gorod**?
who conquered and which city (Kazenin 2002:9)

Facts of this sort led both Kazenin and Gribanova to reject a bi-clausal structure. This conclusion, however, is too rash as it relies on the assumption that reverse sluicing is the only conceivable bi-clausal analysis for CWHs. Since our analysis involves no deletion whatsoever, the two types of bi-clausal sharing we argued for here allow us to capture the bi-clausal properties of CWHs in some languages without having to worry about the problems that reverse sluicing might raise.

Now that we have seen how our proposal compares to purely mono-clausal analyses, exemplified by Gribanova (2009), let us briefly discuss the interpretation of CWHs. This is the topic of the next and final section.

4. Interpretation of CWH Questions: Single Pair Readings

Most researchers working on CWHs agree that they differ in interpretation from MWHs (see Kazenin 2002; Liptak 2003; Whitman 2004, 2006; Gračanin-Yuksek 2007; Scott 2010; Citko in press, among others). Whitman (2004), for example, attributes this preference to a Q-implicature that something is being asked that could not be asked using the multiple WH form, and that a likely candidate is the allowance of a singleton pair-list answer (Whitman 2004:418).

While MWHs typically allow only PL readings, CWHs strongly favor SP readings, as shown by the following contrast:[33]

(40) (a) **Kto** i **kakoj** **gorod** zaxvatil? SP/??PL *Russian*
who.NOM and which.ACC city.ACC conquered.3SG
'Who conquered which city?'

(b) **Kto** **kakoj** **gorod** zaxvatil? ??SP/PL
who.NOM which.ACC city.ACC conquered.3SG
'Who conquered which city?' (Gribanova 2009:141)

This contrast holds in non-multiply wh-fronting languages as well, and becomes even more pronounced if the context strongly favors an SP interpretation, as in the following examples, due to Whitman (2006):

(41) (a) **When** and **where**were you born?

(b) #**When** were you born **where**?

Gribanova (2009) follows Higginbotham & May (1981) and Barss (2000)

[33] There is some disagreement in the literature about the two readings. Many researchers (Whitman 2004; Gračanin-Yuksek 2007; Gribanova 2009) argue that CWHs only allow SP readings; others argue that both readings are in principle available (Ratiu 2010; Scott 2010; Tomaszewicz 2010). However, MWHs seem to always allow the PL reading (but there might be contexts in which SP readings become available). The same reasoning for the reverse claim applies to CWHs.

in assuming that PL readings are generated by the mechanism of QUANTIFIER ABSORPTION (QA), which at LF turns one or more structurally adjacent quantifiers into one binary (or n-ary) quantifier. Furthermore, she proposes that QA is only possible if the two quantifiers are STRUCTURALLY ADJACENT at LF (in the sense of (42)). In CWHs, the conjunction is the head that intervenes between the two wh-elements, thus blocking QA.

(42) α and β are structurally adjacent if and only if α c-commands β, and α c-commands no head that c-commands β. (Gribanova 2009:146)

There are both conceptual and empirical problems with Gribanova's adjacency condition on QA. On the conceptual side, we note that the structural adjacency condition relies on the notion of intervention, reminiscent of a RELATIVIZED MINIMALITY (RM) condition of Rizzi (1990). However, in a typical RM configuration, the intervener is of the same type as the elements between which it intervenes, both in terms of the featural content and in terms of its phrase theoretical status. This is not what we see in CWHs; the intervening conjunction does not have a wh-feature. It is also a head blocking the relationship between two phrasal elements. Typically, heads do not act as interveners with respect to dependencies involving phrasal constituents (and vice versa).

On the empirical side, the adjacency condition predicts that any head should block PL readings. Gribanova considers conjunctions and clitics as potential blockers, but the predictions of the adjacency condition go beyond the

intervention effects induced by these two elements. To illustrate, Slavic languages do not always require both wh-phrases to move to the clause initial position. For example, in the Polish example in (43) below, the indirect object undergoes 'short' wh-movement to some position below the subject. As a result, both the subject and the T head intervene between the two wh-phrases, so Gribanova's analysis predicts that a PL reading should be unavailable. This is not what we find; questions of this sort readily allow PL readings.[34]

(43) *Co* **Jan** *komu* dał? *Polish*

what Jan whom gave

'What did Jan give to whom?'

As independent support for the structural adjacency condition on QA, Gribanova discusses the Serbo-Croatian data involving the clitic *li*, which she analyzes as a complementizer which blocks PL readings, following Bošković (2001, 2002).

[34] One could argue that at LF the indirect object wh-phrase moves further, so that for the purposes of QA, the two wh-phrases are adjacent, as is presumably the case in English. However, this is incompatible with Gribanova's claim in footnote 17 that Slavic languages 'wear their LFs on their sleeves'. Furthermore, if LF movement is possible in such cases, it is not clear what excludes it in CWHs. If it is islandhood, then Gribanova's account needs to be supplemented with one based on islandhood, which is precisely what she argues against.

(44) *Ko* **li** *koga* tuče? SP/*PL *Serbo-Croatian*

who C whom beats

'Who (on earth) is beating whom?' (Grebenyova 2004: 181)

Interestingly, not all clitics have this effect. Auxiliary clitics do not, as shown in (45). Following Bošković (2001), Gribanova takes the string in (45) to involve the pronunciation of the lower copy of *šta* 'what', forced by the PF requirement that the auxiliary clitic *je* appear second in the clause. Thus, (45a) has the LF representation in (45b). For syntactic purposes, the wh-phrases are adjacent. Thus, the clitic does not block QA and does not cause the loss of a PL reading.

(45) (a) *Ko* **je** *šta* kupio? SP/PL *Serbo-Croatian*

who AUX what bought

'Who bought what?' (Bošković 2001:9)

(b) *Ko* ~~*šta*~~ je ~~*ko*~~ *šta* kupio?

However, even *li* does not always block PL readings. This is especially clear in questions in which neither wh-phrase is the subject, as the one in (46) below, most naturally uttered in a scenario where Dad is coming back from a trip, and the speaker is wondering what present he brought to which of the children. If Dad is holding only one present, a CWH is required instead of (46).

(46) *Što* **li** **je** *kome* tata donio? PL/*SP *Croatian*

what LI AUX whom.DAT daddy brought

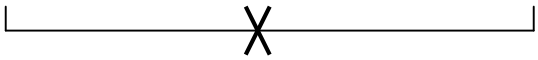
'What (on earth) did daddy bring to whom?'

We agree with Gribanova that in order for the PL reading to be possible, the lower wh-phrase has to be absorbed by the higher one. If QA is blocked, PL reading is lost. However, we attribute the blocking effect not to an intervening head, but to the intervening island boundary, as first suggested by Kazenin (2002) (see also Citko in press). In all three CWH structures we argued for, the two wh-phrases are either in two distinct conjuncts or constitute conjuncts themselves, which suggests the island in question is the coordinate structure. This makes the loss of PL readings in CWHs part of a more general phenomenon, which is the loss of PL readings across island boundaries, discussed by Hagstrom (1998), Dayal (2002, 2006), among others.[35] This follows from a natural assumption that QA, since it can only apply after the movement of wh-phrases, is subject to locality. In (47a), QA is blocked because the two wh-phrases are separated by a wh-island. Consequently, PL reading is not available. We propose an analogous explanation for the lack of PL readings in CWHs; in (47b), which is a representation of our two bi-clausal structures for CWHs, for QA to obtain, one or both of the wh-phrases would have to move out of its conjunct, and in (47c), the mono-clausal structure, QA could obtain only after the movement of (an) entire conjunct(s).

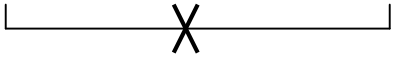
[35] Gribanova acknowledges this as a possibility but does not pursue it on the grounds that it does not generalize to cases involving clitics. We are not sure this is a valid objection given the issues with the clitic facts we pointed out above.

Both movements, however, violate the Coordinate Structure Constraint.[36]

(47) (a) [$_{CP}$*Who* wondered **[$_{CP}$ whether** Sue bought *what*?] SP/*PL



(b) [$_{\&P}$ [$_{CP}$*What* did John sing] **[$_{\&}$, and** [$_{CP}$*why* did John sing?]]



(c) [$_{CP}$ [$_{\&P}$*What***[$_{\&}$, and***where*]] [$_{C'}$ did [$_{TP}$ John sing?]]

(Hagstrom 1998:147)

5. CONCLUSION

In this paper we developed a new typology of CWHs. We argued that Universal Grammar allows for three different structures for such questions: (i) a mono-clausal structure in which both wh-phrases belong to the same clause in both their base and their derived positions, (ii) a bi-clausal structure with bulk sharing of the TP, where the wh-phrases belong to the same TP in their base position, but subsequently move to specifiers of different C heads, and (iii) a bi-clausal structure with non-bulk sharing of everything but the wh-phrases, where the wh-phrases never belong to the same clause. We used four kinds of diagnostics to

[36] As brought to our attention by one of the reviewers, for some speakers PL readings remain possible across island boundaries, especially across wh-island boundaries (as in (47a)). The reviewer also suggests that this could be due to the fact that for those speakers wh-islands are very weak to begin with. This actually lends further support to the analysis we adopt here, which establishes a correlation between islandhood and the presence or absence of PL readings.

determine which of the three structures is available in a particular language: the availability of both MWHs and CWHs in a language, the possibility of conjoining two arguments in a CWH, the grammaticality of a mixed CWH with an obligatorily transitive verb, and the parallelism in superiority effects between MWHs and CWHs. Based on these, we concluded that English only allows the bi-clausal non-bulk sharing structure in (6c), Bulgarian only the mono-clausal structure in (6a), while in Romanian at least both (6a) and (6b) must be available. Slavic languages such as Polish, Russian, and Croatian, which allow the conjunction of arguments in a CWH, and in which a mixed CWH is well-formed with an obligatorily transitive verb, but which do not show superiority effects either in MWH or in CWHs, might in principle allow all three structures. This typology is consistent with the multiple wh-movement parameter setting in the languages we discuss. English does not allow multiple wh-movement, which excludes the structures in (6a) and (6b) as possible sources of CWHs in this language. Bulgarian, on the other hand, is a multiply-wh-fronting language, so proposing that the mono-clausal (6a) is the only structure it has for CWHs is consistent with this parametric setting. Finally, we showed that in deriving CWHs, Romanian has both (6a) and (6b) at its disposal. This is again consistent with the fact that Romanian allows multiple wh-movement.

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