Multiple WHs in Czech not that multiple

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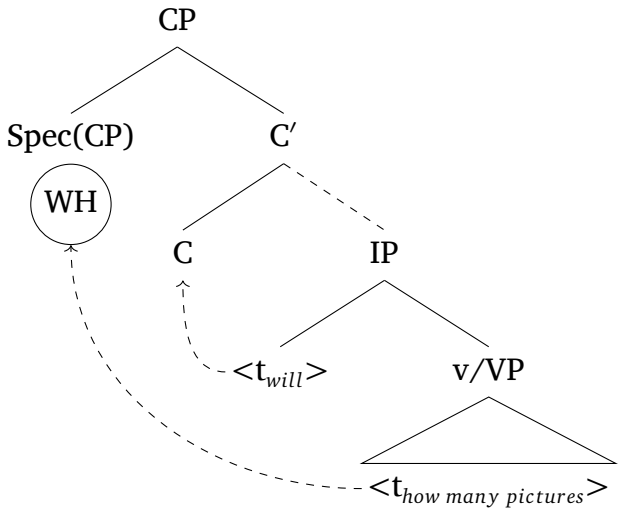
Abstract. This study demonstrates that according to the taxonomy and diagnostics of Rudin (1988), Czech ranks among the non-Multiple-WH-Fronting Languages analysed in terms of the Split CP Hypothesis. The study then concentrates on Superiority effects providing data from corpus research in order to compare the frequency of a variety of attested orderings within groups of WH elements. The hierarchies discussed in the study are (a) The Function/Case Hierarchy, (b) The Category/Size Sequence and (c) The Animacy Hierarchy. The data collected and grouped according to types of WH elements show that Czech demonstrates a statistically relevant preference to keep the formal hierarchies (a/b), but no statistically relevant data are obtained for the Animacy Hierarchy. The study compares the multiple WH structures with the structures containing coordinated WHs, so as to demonstrate the unexplained restriction on Adverbial positions in the left periphery of the Czech clause.

1 Introduction

Since the beginning of the generative enterprise, the structure of interrogative clauses introduced with a WH element has been discussed as a prototypical example of a transformation – a syntactic dislocation triggered in specific (definable) contexts. The main characteristics of the construction were already described in detail in Ross (1967), Baker (1970) and Grimshaw (1979). In the G&B (Government and Binding) framework the analyses of (above all English) WH structures contributed to the development of universal binary-branching projections including the IP/CP domains. The structure in (1) is meant to cover the WH transformation as formalized in a standard generative framework (late Principle & Parameter or vaguely minimalist framework) – it is adopted from Adger (2003) for English. In (2) I provide some English and Czech data to show that the structure may be analysed in the same way in both languages.[1]

1. I deliberately leave out the space between IP and CP unspecified (dotted line) because we will see later on that at least in Slavic there must be more material there.

(1) adapted from Adger (2003): WH Movement (a) WH fronting
(b) Subj-Aux "inversion"



(2)

CZ	**Kolik fotek**	bude	Petr		ukazovat		Janě?
EN	**How many photos**	will	Peter	$<t_{will}>$	show	$<t_{wh}>$	to Jane?

The WH-question structure in (1) assumes two standard functional domains above the verbal projection: the IP and CP. It shows that the process involves the fronting of a unique WH constituent (a phrasal "A´ movement") and (in main clauses) the fronting of the Modal/Auxiliary (an I-to-C head movement) as well. The top projection of CP hosts the WH constituent in its specifier (a phrasal position) and the head C position is the landing site of the interrogative fronting of the auxiliary.

Several specific phenomena attested with English WH questions - and other structures with similar characteristics, as proposed in Chomsky (1973; 1977) – have been discussed in detail with respect to their universal or language specific nature: e.g. the Doubly-Filled Comp Constraint/Filter as in (3)) which states that only one overt [+WH] constituent can appear there (in English).

(3) [CP Lex COMP Lex]
a. I wonder who (*that/*whether) she saw
b. I don't know which book (*that) she bought.
c. the man who (*that) I saw,
d. Peter wonders who (*if) Helen loves.

Another characteristics of the English structures is the so called **Superiority Effect** which refers to the fact that it is the hierarchically highest

WH element in a clause that ends up fronted in the structures with two WH elements. For English both generalizations are illustrated in (4).

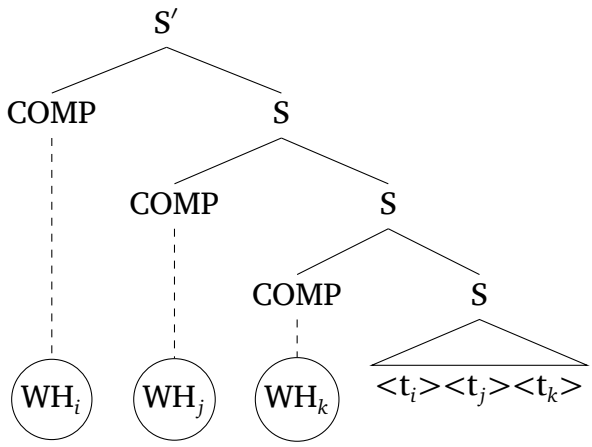
(4) Felix gave a book to Peter and flowers to Jane.
a. *__What whom__ did Felix give (to)?
b. __What__ did Felix give to __whom__?
b'. I wonder __what__ Felix gave to __whom__.
c. *__Who(m)__ did Felix give __what__ (to)?
c'. *I wonder __who(m)__ Felix gave __what__ (to).
d. *__To who(m)__ did Felix give __what__?
d'. *I wonder to __whom__ Felix gave __what__.

1.1 The specifics of WH Movement in Slavic

Even before the G&B period, the first Slavic data were introduced to the generative field in e.g. Browne (1972), which showed that some characteristics of English WH Movement must be language specific – including the above mentioned uniqueness of the fronted WH constituent and the Superiority effects.[2] Soon after Wachowicz (1974; 1978) and Toman (1981) also demonstrated that the ungrammatical examples in (4) are standard in some Slavic languages and each of the authors proposed a structural analysis for the parametric distinction. For example, to accommodate a cluster of multiple clause initial WH elements, Toman (1981) argued that more than one node in the Comp level (labelled as S) may be available in Slavic and possibly even more generally. His structure is schematically demonstrated in (5). In the examples below the WH constituents are marked as WH and their unrealized copies as co-indexed traces <t>.

2. In fact, multiple WH fronting is attested in spoken English as well (see Bolinger 1978) and the Superiority effect can be violated, too, when more than two Wh constituents are questioned. General explanation of the Superiority Effect and its violations, in terms of syntax, semantics and phonology respectively, can be found in e.g. Kuno & Robinson (1972), Pesetsky (1984) and Dayal (2005).

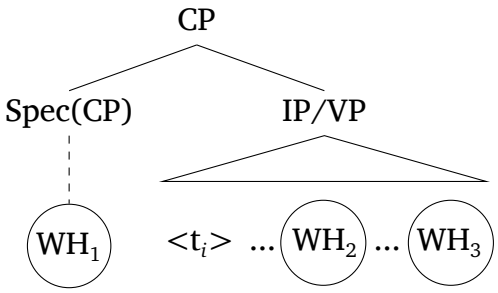
(5) Toman (1981)



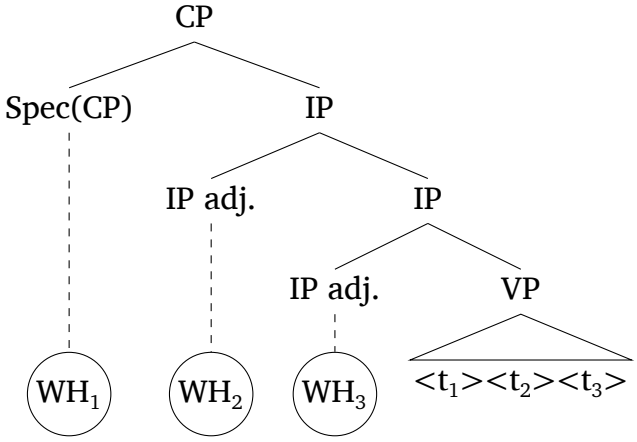
In the G&B period, when a universal system of phrasal projection was accepted, including the CP-IP-vP structure, the schemes in (6) represent a typical proposal made in Lasnik & Saito (1984). The authors concentrated on the taxonomy of government relations and discussed mainly sets of English data, but they also tried to analyse some few Polish (Slavic) examples. They proposed that the distinction between a single and multiple WH structures is in fact only apparent; in both English and Slavic it is only the first WH-word that is located in the unique SPEC(CP).

(6) Adapted from Lasnik & Saito (1984)

a. Unique WH (English)



b. I/FocP adjunction (Slavic)



In English, as illustrated in (6a), the hierarchically highest WH element moves to SPEC(C) and the other WH elements remain in their low base positions (in situ[3]), because no alternative position is available. In Slavic, schematically represented in (6b), the first WH element moves to SPEC(CP) and the other WH words are adjoined to the immediately following functional projection. Lasnik & Saito proposed adjunction to INFL/I. In her thorough cross-linguistic study, Rudin (1988) demonstrates that there are in fact two kinds of Slavic languages with distinct characteristic multiple WH movement – one group (e.g. Bulgarian and Rumanian) does not show any Superiority effects, i.e. there is no structural distinction between the multiple fronted WH elements – they form a cluster. Rudin calls these languages the 'Multiple-Wh-Fronting Languages.' She assumes a hierarchical structure within the CP domain, with the initial WH constituent in SPEC(CP) and the non-initial ones adjoined to the right of the very same SPEC(CP). The cluster of WH constituents thus represents a complex but still unique structure located as a single inseparable constituent in SPEC(CP). Rudin (1988) calls these languages the Multiply Filled Specifier [+MFS] languages and states their main characteristics as follows:

(7) a. the cluster of WH constituents cannot be interrupted (by clitics or parentheticals),
b. the WH cluster is hierarchical, showing Superiority Effects (a fixed word order),
c. the structure systematically violates the WH-island Constraint.

As for Czech, Polish and Russian, Rudin (1988) proposes that these are the non-Multiple-Wh-Fronting Languages (the [-MFS] languages) which do not form a WH cluster in the CP domain but fill the SPEC(CP) with only one unique WH constituent. Therefore they do not follow the characteristics listed in (7). For those languages Rudin in general adopts the analysis proposed in Lasnik and Saito (1984) and illustrated above in (7b).

Using a bare phrase structure formalism with multiple SPECs and minimalist feature checking, Citko (1998) demonstrates the parallelism between the orders of indefinite/ negative pronouns and the WH

3. The term *in situ* means here a base generated position. This position in English usually correlates with the word order in the unmarked declarative clause. In Slavic, however, we have to take into account the fact that all constituents, including objects and adverbials, can also appear pre-verbally, and postverbal subjects exist as well. Therefore, there is a distinction in Czech between the base generated position and the position of the constituent in a standard declarative clause. With respect to the former, the WH constituents are fronted, with respect to the second, however, the fronting is less obvious.

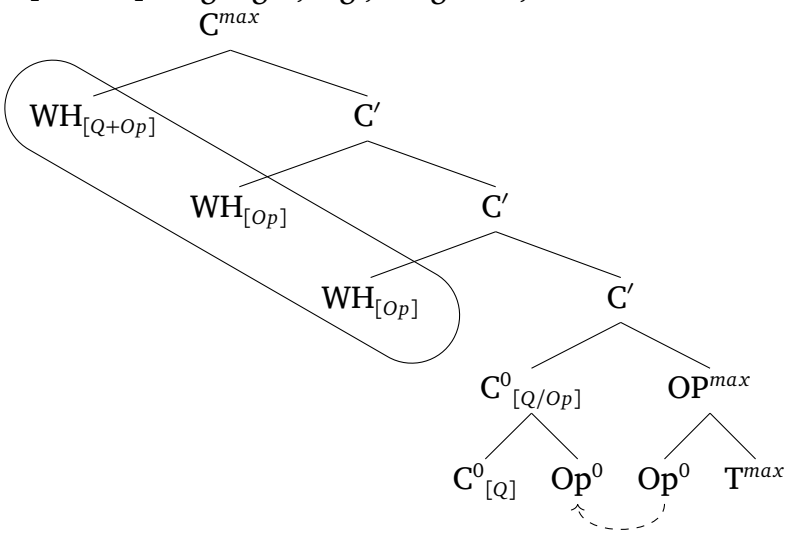
elements. Dealing with mainly Polish and Bulgarian data, she also uses Rudin's parametric distinction between the [±MFS] languages. Moreover, in the 1990s, the generally accepted structure of clauses became more complex and came to include functional heads related to discourse features.

The availability of multiple SPEC positions and the existence of more functional heads in the high periphery of a clausal domain made Rudin's theoretically controversial multiple adjunctions to SPEC(CP) and to IP unnecessary. Citko (1998) proposes a new functional projection located between CP and TP, the Operator Phrase (Op), containing a feature [Op] which must be checked against the features of the indefinite/negative/WH pronouns. The distinction between the [±MFS] languages is consequently based on position of the feature [Op]. The feature [Op] can either stay in the head Op, or it can move to a higher head position, namely to C. In the [+MFS] languages (e.g. Bulgarian), the Op-to-C movement takes place, and therefore the indefinite/negative/WH pronouns have to follow it and move first to CP to form a cluster there. This structure is demonstrated in (8a) below.

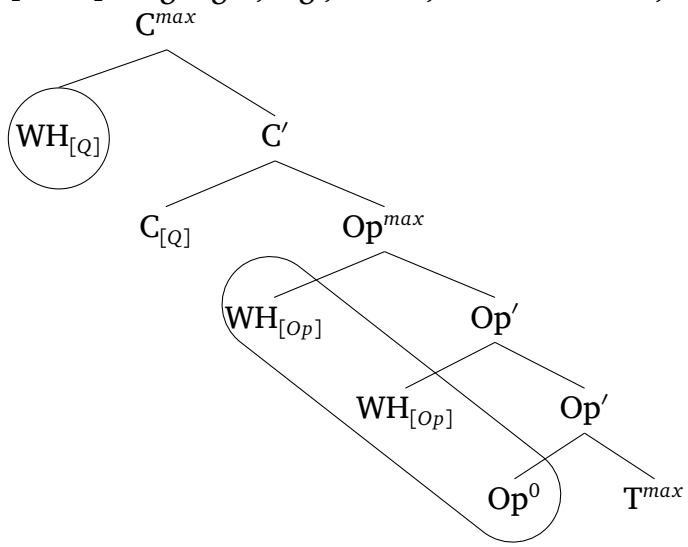
In languages with no Op-to-C movement, i.e. in the [-MFS] languages (Polish and Czech) the feature Op stays in the Op head and the indefinite/negative/WH pronouns therefore move to the Op domain. Only one of them moves further on to the SPEC(CP) position to check the feature [Q] of C, This structure is demonstrated in (8b).

(8) adapted from Citko (1998: 103)

a. [+MFS] languages, e.g., Bulgarian, Romanian



b. [-MFS] languages, e.g., Czech, Serbo-Croatian, Polish



The often cited analysis of Bošković (1997; 2002; 2007) represents in principle the same proposal as in (8) - with the exception of the labelling. Bošković labels the new projection between TP and CP as a Focus projection. He follows Citko in arguing that the multiple WH-questions in Slavic represent a combination of two processes: (a) Focus Fronting (which is recursive and can violate Superiority) and (b) WH-Fronting (which is subject to Superiority effects).

Rizzi (1997; 2001) proposes that the CP is to be decomposed into four separate projections: Force, Topic, Focus, and Finite. Rizzi (1999) posits Spec,FocP as the landing site for wh-phrases. Richards's (2001) follows Rudin (1988) and argues that in some languages it is not Spec,FocP only, because in some languages (e.g. Bulgarian) it should be a higher position, e.g. Spec,TopP (see also Grohmann's for German).

Accepting this Split-CP Hypothesis in her dissertation, Turek (2012) discusses mainly Polish data to argue that the variety of multiple WH structures among Slavic languages is the result of language specific distributions of the WH elements in multiple functional heads in the CP domain. In this framework an adjunction to TP is prohibited, and movement is motivated by either the feature checking requirement or satisfaction of the Focus/Topic criterion. Turek (2012) accepts this formalism and assumes that both in Polish and (non-embedded) English, Wh movement targets the position in SPEC(IntP) – bold in the structure below where IntP = Interrogative Phrase.

(9) ForceP - (TopP) – **IntP** - (TopP) – FocP - (TopP) – FinP – TP

Both Bošković and Turek systematically investigate the absence and presence of violations of the Superiority and the latter study's arguments

include references to experimental tests of the Superiority phenomena, e.g. Alexopoulou & Baltazani (2012) discussing the Greek data.

The preceding paragraphs demonstrate that since the beginning of the generative framework there are two main structures repeatedly proposed for Slavic languages; one analysis assumes all the multiple WH elements to form a cluster in basically one recursive clause-initial position (adjunctions or multiple SPECs). The second analysis puts the very initial WH constituent in a unique position separating it from the other(s), alternatively it provides a specific position for each WH constituent. This describes the 'Non-Multiple-Wh-Fronting Languages' (the [-MFS] languages). The attested distinctions between the languages were listed in (7), and some of these characteristics are going to be discussed in detail for Czech in the following sections.

1.2 Czech is an [-MFS] language

Rudin (1988) used three main criteria as in (7) to characterize the [+MFS] Slavic languages. In all the studies mentioned above, the authors situate Czech, together with Polish, Serbo-Croatian and Russian, in the group of [-MFS] languages, i.e. in the group of languages in which clusters of fronted WH constituents are supposed to divide into the initial one and the others as in (8b); according to Rudin's criteria, these languages should have the following characteristics, the opposite of those in (7):

(10) i. the cluster of WH constituents can be interrupted (by clitics or parentheticals),
ii. the structure obeys the WH-island Constraint (the Doubly Filled Comp Filter),
iii. the WH cluster does not show Superiority Effects (the show free WH order).

As for the characteristic in (10i), I will leave it aside here, confirming it with no additional argumentation. Below I will briefly demonstrate (10ii) and in more detail the following sections will discuss (10iii).

First we will see that the **Doubly-Filled Comp Constraint/Filter** which excludes the co-occurrence of a *wh*-phrase and a complementizer in a CP domain as in English in (3) above, does not apply in Czech. In (11) we can see that the unmarked complementizer *že* (that) can co-occurr with the fronted WH constituent – in (11) it can be both subject or adjunct.

(11) Kdo / Kdy / Kam **že** mu to dal?
who$_{NOM}$ / When / Where **that** him it gave
'Who gave it to him?' / 'When/Where did he give it to him?'

The analysis of this phenomena is related to the analyses of another constraint - **the WH-island Constraint**. It is one of the basic island constraints from Ross (1967) and Chomsky (1973; 1977). It claims that movement out of a clause, though apparently unbounded, must occur in steps via the CP domain (the 'escape hatch'). The WH-island constraint states that a WH constituent cannot be moved via a CP which is overtly marked for [+WH], i.e. which contains a WH marked element in either the SPEC(CP) or the C head. This is demonstrated in the contrasted sentences in (12). The grammatical structure in (a) shows that the WH constituent can be extracted from the embedded clause (CP). The ungrammaticality of the examples (12b-f) is explained by the violation of the WH-island Constraint: the position in the CP domain is not available because the escape hatch is filled by another [+WH] constituent, and therefore the movement out of the clause is blocked.

(12) **Which book$_i$** did Peter say/ask...
a. [$_{CP}$ <**t$_i$**> **(that)** [$_{IP}$ Felix liked <t$_i$>?
b. * [$_{CP}$ **whether** [$_{IP}$ Felix liked <t$_i$>?
c. * [$_{CP}$ **who$_j$** [$_{IP}$ <t$_j$> wanted to see <t$_i$>?
d. * [$_{CP}$ **why$_j$** [$_{IP}$ Felix liked <t$_i$> <t$_j$>?
e. * [$_{CP}$ **how$_j$** [$_{IP}$ Felix had finished <t$_i$> <t$_j$>?
f. * [$_{CP}$ **if** [$_{IP}$ <t$_i$> was available locally?

According to Rudin (1988), the [+MFS] languages violate the Wh-island Constraint because they can have several elements in the SPEC(CP), and these elements should be able to serve as a multiple escape hatch, allowing the movement out of the clause. On the other hand, the [-MFS] languages have only one unique SPEC(CP) and this should lead to a limitation of movement out of the embedded clauses. The two Czech examples which show the sensitivity to the Wh-island in Czech are given below, adopted from Sturgeon (2008:23).[4] They are as ungrammatical as their English counterparts.

4. Sturgeon (2008), in discussing discourse phenomena in Czech, compares WH structures with Focus and Contrastive Topic constructions, claiming that both WH and Contrastive Topic represent examples of operator-variable A-bar movement motivated by syntactic features in I. For her, therefore, the initial WH element (as well as an initial contrastively topicalized constituent) is located below the CP domain, and the non-initial WH elements are adjoined as low as to vP.

(13) a. *Komu$_1$ viděl Felix chlapa **který** dal kytky <t$_1$>?
whom$_{DAT}$ saw Felix$_{NOM}$ guy$_{ACC}$ who$_{NOM}$ gave flowers
intended: 'To who did Filip see the man who gave the flowers?'

b. *Komu$_2$ by tebe zajímalo **koho$_1$** Felix představil t$_1$ t$_2$?
whom$_{DAT}$ AUX you$_{ACC}$ interested who$_{ACC}$ Felix introduced
intended: 'To who do you wonder whom Filip introduced?'

In example (13a), the extraction out of the relative clause is clearly ungrammatical. As for (13b), based on the discussion in Veselovská (1995), the example may be rejected mainly because the matrix verb is not a suitable 'bridge verb'. With (a slightly idiomatic) reflexive bridge verb *myslet si* 'think' extractions are not only possible, as demonstrated in (14), but even allow for a violation of the *that*-trace filter in (14b).[5]

(14) a. Koho$_1$ si myslíš (že) **komu$_2$** Jana představila *t$_1$ t$_2$*?
whom$_{ACC}$ REFL think$_{2S}$ that whom$_{DAT}$ Jane introduced
'Whom do you think Jane introduced to who?'

b. Kdo$_1$ si myslíš (že) **komu$_2$** **kdy$_3$** *t$_1$* pomohl *t$_2$ t$_3$*?
who$_{NOM}$ REFL think$_{2S}$ that whom$_{DAT}$ when helped
'Who do you think helped to who when?'

The acceptability of the example in (14) may well indicate that Czech is able to violate the WH-island Constraint, violating thus the assumed typological characteristics as in (10ii). However, the bridge verb *myslet si* 'think' is rather unique, and e.g. Toman (1981) takes it for an idiomatic parenthetical. Moreover, the long distance movement in Czech is not accepted in the standard language. And third, the theoretically most important argument in favour of the WH-island Constraint being active in Czech is the position of the unmarked complementizer *že* 'that', which can introduce the embedded clause as in (14). Given that the standard place of this [-WH] complementizer is following the initial WH constituents, its position preceding the WH elements in the embedded clause in (14) signals that the CP domain in fact *does not contain any [+WH] constituent*. Because of the three argument above, I conclude that Czech in general respects the WH-island Constraint and thus fulfills the (10ii) characteristics of the [-MFS] language stated in Rudin (1988).

The next section is going to concentrate on the characteristics given in (10iii), i.e. the presence/lack of an internal structure of the fronted multiple WH cluster.

5. The position of the subject's lower copy (trace) is given in (12b) as following the non-initial WHs – i.e. it assumes the IP adjoined analysis, even though Rizzi (2001) proposes that an extracted subject WH (in languages which violate the *that*-trace Filter) originates post-verbally. I believe this distinction is not relevant for the discussion here.

1.3 The Superiority Effects

In the generative framework, the Superiority Effect is considered to be the hallmark of a derivational economy principle applying to hierarchical structure (the realization in a CP of an Attract Closest Principle). Its significance is even more crucial in the minimalist theory of feature checking. When analysing the multiple WH structures in Slavic, Bošković (1997) 1998) in fact ignores most of the criteria proposed in Rudin (1988) in favour of a detailed analysis of Superiority Effects. A very similar approach is accepted for Polish in Citko (1998) and Citko & Grohmann (2000).

As for Czech, providing several examples, Toman (1981) already states that there are no Superiority effects detectable in Czech. Rudin (1988) refers to Toman (1981) and provides several Czech paradigms with a random order of fronted subject and object WH constituents suggesting that Czech should be ranked among the [-MFS] languages, together with Polish and Russian. Other studies repeat her classification.

The list of characteristics in (10iii), states that the [-MFS] languages do not show Superiority effects. According to Bošković (1997) 1998), a subgroup of [-MFS] languages (e.g. Serbo-Croatian, but not Czech) violate Superiority only in root contexts, but show no violations in embedded clauses. The root vs. embedded context parameter is tested also in Meyer (2008) with the same results, i.e. demonstrating that in Czech there is no attested distinction between the root and embedded multiple WH questions.

The examples from corpus research provided in this study are mostly direct WH questions. Similar orders, however, were also attested in indirect questions, as illustrated below. The example in (15) shows multiple WHs in an indirect question, which is a complement of a verb. In (16) multiple WHs introduce an adjectival predicate, and in (17) they appear at the beginning of a complement of a noun.[6]

(15) **Kdo** chce **komu** **co**, říct?
who$_{NOM}$ wants whom$_{DAT}$ what$_{ACC}$ tell
'Who wants to say what to whom?'

(16) **Kdo** **co** dělal a **proč** a **jestli** s pocity anebo
who$_{NOM}$ what$_{ACC}$ did and why and if with feelings or
bez nich je ostatně jedno.
without them is anyway equal
CNC: 'It is anyway irrelevant, who did what and why, and whether with some feelings or without them.'

6. In this study, all the examples marked as CNC are taken from the Czech National Corpora. The unmarked example were made by the author.

(17) **Kdo** **koho** odpravil a **jakým** způsobem CNC
who$_{NOM}$ whom$_{ACC}$ killed and which manner
'Who killed whom and in which way.'

In this study I will not discuss further any distinction in Czech between root and embedded contexts.

1.3.1 Testing the Superiority Effects in Czech

Although many studies of the multiple WH phenomena cite among other Slavic languages also the Czech language, not many reliable and sufficiently robust Czech data appear in the compared paradigms. One of the few exceptions which provides evaluations of the Superiority Effects in Czech and is based on detailed empirical data and experimental testing is Meyer (2008); some relevant data are also mentioned in Sturgeon (2008) and Gruet-Skrabalova (2011; 2016). In the following sections I will refer to Meyer (2008), comparing the experimental results presented in his study with data found in the Czech National Corpus.

Meyer (2008) is an empirical study, reporting the statistic results of a series of Magnitude Estimation studies (based on Bard, Robertson & Sorace 1996), which test the acceptability of various orders of WH elements in Russian. Polish, and Czech. The evaluations of a variety of data have been elicited in experimental texts (using about 25 native informants) and compared with evidence from large text corpora. The experiment followed a model that claims that linguistic judgments are similar to psychophysical responses. It assumes that the participants of the experiment can assess the acceptability of stimuli naturally and reliably by giving comparative responses based on a proportional scale like 'half as good', 'one third as good'.[7]

In Meyer's experiment participants were first presented with a reference clause of intermediate acceptability and assigned a numerical acceptability rating. They also got a series of fillers and test items to assess in comparison to the original reference clause.[8] This method hopefully allows subjects to express their intuition without complex and not easy linguistic categorizations. The judgment values were log-transformed for comparability.

7. The method has been applied successfully in linguistic research including the research on superiority effects. For example Featherston (2005) compares English and German wh-constraints.
8. 8 relevant superiority conditions (16 items) were tested, along with 2 more *wh* order conditions in double long extraction contexts. These 20 items were presented together with 16 long extractions of various kinds and 12 unrelated fillers, making overall 48 sentences, in random order. 25 subjects participated in the study.

The experiment used 3 sub-studies for Czech, mainly using the WebExp software package. To avoid effects of normativity, participants were instructed to imagine they have overheard the given sentence uttered by someone else in casual conversation, and they should judge its naturalness and grammatical correctness. Data from unclear or doubtful sources were excluded from evaluation. At the end, Meyer (2008) does not attempt to react to present day minimalist analyses or clear cut taxonomy; instead he proposes 'a scalar view of the strength of superiority effects, with different potential cut-off points between grammaticality and ungrammaticality among the Slavic languages.' (Meyer 2008:44). The results of the experiment will be cited in the following sections. In these I compare Meyer's experimental report for Czech with statistics based on the data obtained in the Czech National Corpus.

The Czech National Corpus (CNC) is an academic project (founded in 1994) with the main aim of continuously mapping the Czech language by building and annotating a variety of large general-purpose texts. It is based at the Institute of the Czech National Corpus, Faculty of Arts, Charles University, Prague. It allows access to a variety of specialized corpora, some collecting written or spoken texts and some specializing in specific periods, authors or genres, including on-line genres. A part of the corpus is annotated using specific morpho-syntactic and pragmatic labels.[9]

The search in the CNC was undertaken in January 2020 with the use of the concordancer in *Korpus InterCorp v11- Czech* (the late version from 2018). *InterCorp v11* is built around written (literature) texts but it also includes other kinds of texts e.g. official politics of the Acquis Communautaire a Europarl).[10]

(18) Intercorp v11 Atributes

words	2 202 704
lemma	1 147 606
tags	4 147
lc	1 845 031
lemma_lc	1 079 158

In looking for the ordering in fronted multiple WH elements I checked the order of chosen individual WH constituents in contexts with no in-

9. See https://wiki.korpus.cz/doku.php/en:cnk:uvod and https://wiki.korpus.cz/doku.php/cnk:intercorp:verze11).

10. I am grateful to Kristina Rusnok for her help with the technicalities of corpora search.

tervening elements. A sample of the search formula is in (19).

(19) [word="\." | word="\?" | word="\!"]
[lemma = "kdo" | lemma = "co" | lemma = "jaký" | lemma = "který" | lemma = "čí" | lemma = "kde" | lemma = "kam" | lemma = "kudy" | lemma = "kdy" | lemma = "odkdy" | lemma = "proč"]
[lemma = "kdo" | lemma = "co" | lemma = "jaký" | lemma = "který" | lemma = "čí" | lemma = "kde" | lemma = "kam" | lemma = "kudy" | lemma = "kdy" | lemma = "odkdy" | lemma = "proč"]

Similar searches were made for the same WH elements with one, two and three words inserted. The examples were then sorted out manually to exclude the structures which did not represent a possible interrogative structure with multiple fronted WH elements. In the following sections I will present a simple statistical evaluation of the orderings for two non-interrupted WHs and for two coordinated WHs. In the initial paragraph and summary of each section I will compare the findings with compatible data in Meyer (2008).[11]

2 Two initial WHs with no intervener: corpus data

The research of the relative order of WH subject and WH object is presented in Meyer (2008) in terms of the following factors:

(20) a. the order between a Subject WH and an Object WH
b. the influence of Animacy vs. Inanimacy

Interpreting the statistics, Meyer (2008) states that in Czech the 'multiple *wh* questions showed some superiority-like preference for *wh* subject > *wh* object, as well as the exception to it caused by the "reverse animacy effect"...'[12]

In other words, a significant main effect on *the initial position* was found only for the animate WH subjects *kdo* 'who$_{NOM}$' when it combined with the animate ACC object *koho* 'who$_{ACC}$'. This ordering for items

11. Meyer (2008) refers to corpora as a part of his argumentation (e.g in searching for counter-examples).
12. Meyer concludes that based on these criteria, Czech multiple wh-questions are the same as the Polish ones but they differ from Bulgarian multiple wh-questions, in which the superiority effects between *wh* subjects and *wh* objects hold irrespectively of animacy (as demonstrated in Billings & Rudin (1996) and Blaszczak & Fischer (2001)).

equal in animacy respected the function-based optimality-theoretic ranking proposed in Müller (1999) and used in Meyer (2008), given here in (21). The arrow means 'hierarchically superior'.

(21) a. Subject ⇒ Object
b. animate ⇒ inanimate

The reverse animacy effect refers to the fact that when an animate subject is combined with an inanimate object *co* 'what$_{\text{ACC}}$', no preference was statistically significant. The hierarchies in (21) predict however, that the preference for the NOM$_{\text{anim}}$ + ACC$_{\text{inanim}}$ order should be even stronger, but this prediction was not confirmed. The order ACCinanim + NOManim was accepted as well as the opposite one, in spite of the fact that it violates both of the presumably universal hierarchical scales given in (21).

As for my search in the CNC, looking for the combination of clause initial multiple WH constituents with no interfering element, close to 350 examples were found from which obvious errors were excluded.[13] This left 120 examples of multiple WH structures relevant to our discussion.

Rearding **the size of the sentences** with multiple WHs, most of them were very short; the average number of constituents was 3.5. From the 120 relevant examples, as many as 69 clauses had (apart from the two fronted WH elements) only one constituent. 37 examples had apart from the WHs only 2 other constituents. Therefore quite logically, it is a verbal predicate that most frequently follows the WHs. In 91 examples (from 120) it is a lexical Verb, while 14 tokens have a copula or non-clitic auxiliary. Only 4 tokens have in the next position clitic pronominals or auxiliaries, i.e. the elements which – in certain structural frameworks - signal a fixed structural position.[14]

As for the kinds of the WH elements fronted with no intervening element in between, the overall statistics are given in (22), using the categorial status of the WH constituent. Notice that with multiple WH elements fronted, the statistically most frequent combination involves two (mostly argumental) pronominal (i.e. DP) WH constituents, followed by a combination of a pronominal WH with adverbial WH. The combination of two adverbial WH elements is in fact *close to non-existent*.[15]

13. The examples not counted include mostly repetitions in spoken discourse or combinations of WH elements with some function other than interrogative.

14. As stated in (i), Czech, as a [-MFS] language, should prefer the position of the clitic to follow both the WH constituents. The 4 tokens of clitics following the two WHs thus represent counterexamples. However, these 4 examples are statistically minimal compared with the hundreds of examples found in which auxiliary and pronominal clitics represent the by far most frequent intervening element separating the initial WH.

15. In the text below I will mark the WH constituents as follows: the case-marked

(22) The number of combinations with respect to their categorial/functional status

combinations	number of tokens found
DP + DP	89
DP + ADV // ADV + DP	30
Adv + Adv	1
Σ	120

Table (24) below indictes the order of case marked DPs, including the combinations with (mostly simple) ADVs. The information provided by these data are organized in terms of assuming the Superiority order for the WH elements – i.e. it assumes that structural hierarchy will be reflected in the linear order of the WH pairs.

The assumed hierarchy of the WH constituents has been given in (21). Below, in (23), I use a more fine-grained version of (21a), i.e. the hierarchy reflects the sentence functions of the WH constituents. In Czech ACC Case is the unmarked Case of V-complements which standardly passivize, DAT is the Case for Recipients, and for Oblique (OBL) Cases, I assume they should be analysed as PPs. The resulting Function/Case Hierarchy proposed here is then as in (23).[16]

(23) **The Function/Case Hierarchy**
NOM ⇒ ACC ⇒ DAT ⇒ OBL/PP

The left part of the Table in (24) gives numbers of tokens in which the order of WHs conforms to the hierarchy, the percentage being computed from the number of relevant examples, with reference to an example of the given structure. The right part of the table gives the opposite, counter-hierarchical orderings. The sum of the hierarchical vs. counter-hierarchical examples is provided in the bottom line, and the percentage is counted from the sum of the relevant examples, not from the percentages above.

pronominals (or more complex DPs) with the label for their Case: NOM(inatve), ACC(usative), DAT(ive), INS(trumental) and OBL(ique). For WH adverbs (or adjunct PP adverbials) I will use the label ADV.

16. A hierarchy including an oblique Case such as DAT-ACC, ACC-GEN, etc. is also used in Dornisch (1998) for Polish.

(24) **The order of two fronted case-marked WH elements and simple WH adverbs**

from 114 tokens[17].....	Σ	%	*example*		Σ	%	*example*
NOM-ACC	42	36,8	(27)	ACC-NOM	11	9,6	(28)
NOM-DAT	7	6,1	(29)	DAT-NOM	0	0	#(30)
NOM-OBL	12	10,5	(34a)	OBL-NOM	0	0	#(35a)
ACC-OBL	1	0,9	(34b)	OBL-ACC	1	0,9	(35b)
ACC-DAT	7	6,1	(31)	DAT-ACC	3	2,6	(32)
NOM-ADV	11	9,6	(36a)	ADV-NOM	8	7	(37a)
ACC-ADV	11	9,6	(36b)	ADV-ACC	0	0	(37b)
hierarchical	**91**	**79,8**		**counter-hierarchical**	**23**	**20,2**	

In the above table the column following the percentages indicates references to the examples below that illustrate the ordering. When the example was not found in corpus, it is made by the author, and its acceptability is marked and mentioned in the text.

2.1 Nominative – Nominative combinations

There are not many structures which contain two Nominative WHs, i.e. structures where both subject and a nominal or adjectival predicate are questioned (in Czech both are usually morphological Nominatives). Only 6 tokens were found, one of which is illustrated just below. The distinction between the NOM subjects and NOM predicate is justified based on the possible substitution of INS for the predicate NOM; in (25) the predicate WH is glossed as NOM(INS?).

(25) a. **Kdo** **co** byl CNC
who$_{NOM}$ what$_{NOM\ (INS?)}$ was
'Who was what?'

b. **Jaký** **kdo** vlastně je? CNC
how/which$_{NOM(INS?)}$ who$_{NOM}$ actually is
'Who is actually what?'

17. Excluding combinations NOM + NOM in copular sentences as in (23) and ADV + ADV; see (36). DAT is missing in some combinations because no reliable example was found with any ordering.

In the example in (25a) the predicate NOM(INS?) follows the likely subject NOM element, while in (25b) the order is the opposite. The former order was more frequent, but the small number of tokens does not justify any generalization.

2.2 Nominative – Accusative combinations

The Table in (24) states that the ordering of Nominative and Accusative in general shows a tendency to be hierarchical i.e to confirm Superiority. Considering only the Function/Case Hierarchy as given in (23), the ratio is 4:1 in favour of the NOM-ACC order. When the animacy characteristics are integrated, the numbers are as given in (26).

(26) **Animacy of the NOM-ACC and ACC-NOM combinations**
(a: animate, i: inanimate)

from 52 tokens.....	Σ	%	.....	Σ	%
NOManim + ACCanim	31	59,6	ACCanim + NOManim	0	
NOManim + ACCinanim	**9**	**17,3**	ACCanim + NOMinanim	1	2
NOMinanim + ACCanim	1	2	**ACCinanim + NOManim**	**9**	**17,3**
NOMinanim + ACCinanim	1?		ACCinanim + NOMinanim	1?	
	42	80,8		10	19,2

The variety of corpus examples summarized in (26) demonstrates a prototypically animate characteristic of the Nominative subjects – almost all NOM subjects are marked as animate. In (26) we can see that the Function/Case Hierarchy is kept in all the cases when both the Subject and Object are animate, i.e. they are equal in animacy. The same hierarchy, however, is *not* kept at all with inanimate objects. The orderings NOM-ACC and ACC-NOM were equally frequent (both are in bold in the examples just below). Thus the **reverse animacy effect** mentioned in Meyer (2008) is fully confirmed by the corpus data.

In the next paragraphs I give corpus examples for the orderings mentioned in the above summarizing Tables. First, (27) illustrates the **hierarchical orderings** between the WHs in Nominative and Accusative, i.e the orders NOM + ACC. Example (27a) is a [+ANIM] + [+ANIM] combination, while (27b) is [+ANIM] + [-ANIM]. Due to the prototypical animacy of subjects, the inverted animacy is rarer in the NOM-ACC pairings and (27c) shows a unique example of [-ANIM] + [+ANIM]. (27d) also illustrates a unique example of a possible [-ANIM] [-ANIM] combination. However, Nominative and Accusative inanimate WHs are synonymous in Czech and therefore the order in (27d) is in fact ambiguous.

(27) a. **Kdo** **koho** začal svlékat? CNC
who$_{\text{NOM.anim}}$ whom$_{\text{ACC.anim}}$ started undress
'Who started to undress whom?'

b. **Kdo** **co** pije dneska? CNC
who$_{\text{NOM}}$ what$_{\text{ACC.inanim}}$ drinks today
'Who started to undress whom?'

c. **Co** **koho** čeká ví jen Bůh. CNC
what$_{\text{NOM.inanim}}$ whom$_{\text{ACC.anim}}$ awaits knows only God
'What is awaiting whom, only God knows.'

d. **Co** **co** znamená? CNC
what$_{\text{NOM/ACC.inanim}}$ what$_{\text{NOM/ACC.inanim}}$ means
'What means what?'

The less frequent **counter-hierarchical orderings** between the WHs in Nominative and Accusative, i.e. the ACC + NOM orderings, are illustrated in (28). Example (28a) shows the [+ANIM] + [+ANIM] combination, which is not attested in the corpus but can readily be formed by native speakers. (28b) is a unique [+ANIM] + [-ANIM] combination, and (28c) represents the most frequent variant or the ACC + NOM ordering. No unambiguous combination of two [-ANIM] NOM elements was found in the corpus, although the example (28d) above can also be interpreted that way.

(28) a. **Koho** **kdo** volal? CNC
whom$_{\text{ACC.anim}}$ who$_{\text{NOM.anim}}$ called
'Who called who?'

b. **Koho** **co** zabije? CNC
whom$_{\text{ACC.anim}}$ what$_{\text{ACC.inanim}}$ will.kill
'What will kill who?'

c. **Co** **kdo** říkal o mý ruce? CNC
what$_{\text{ACC.inanim}}$ who$_{\text{NOM.anim}}$ said about my hand
'Who said what about my hand?'

2.3 Other case marked WH combinations

The above Function/Case Hierarchy was also considered with respect to DAT objects. However, only 18 relevant combinations with DAT were found in the corpus, 7 in combination with NOM and 10 with ACC. For the combination of NOM + DAT, 7 followed the Function/Case Hierarchy and examples of these NOM + DAT combinations are given in (29). The only counter-hierarchical combination DAT + NOM was found with the

two WHs appearing second and third among 3 WHs, as in (30a). In (30b) I shows that DAT + NOM alone can be formed with no violation of grammaticality. The effects of animacy with NOM and DAT combinations could not be determined because in all these examples the two were animate.

(29) **Hierarchical NOM + DAT**
Kdo **komu** velí? CNC
who$_{NOM}$ whom$_{DAT}$ give orders
'Who gives orders to whom?'

(30) **Counter-hierarchical DAT + NOM**
a. Co **komu** **kdo** záviděl? CNC
what$_{ACC}$ whom$_{DAT}$ who$_{NOM}$ envied
'Who envied whom what?'
b. **komu** **kdo** velí? CNC
whom$_{DAT}$ who$_{NOM}$ give orders
'Who gives orders to whom?'

Among ACC and DAT combinations, examples for both orders are shown in (31) and (32).

(31) **Hierarchical ACC + DAT**
Co **komu** mohl udělat? CNC
what$_{ACC}$ whom$_{DAT}$ could$_{3S}$ do
'What could he do to whom?'

(32) **Counter-hierarchical DAT + ACC**
Komu **co** vrátili? CNC
whom$_{DAT}$ what$_{ACC}$ gave back
'What did they give back to whom?'

The hierarchical orders based on (23), i.e. ACC + DAT, occur in the ratio 7:3; Including the animacy-based hierarchy (21b), the number of tokens are as follows.

(33)

from 10 tokens.....	Σ	.....	Σ
ACCanim + DATanim	0	DATanim + ACCanim	0
ACCanim + DATinanim	**0**	**DATanim** + **ACC**inanim	3
ACCinanim + **DAT**anim	7	DATinanim + ACCanim	**0**
ACCinanim + DATinanim	0	DATinanim + ACCinanim	0

The corpus data (though not very robust) show no correlation between the formal (Function/Case) and semantic (Animacy) hierarchies, since **no example violated or confirmed both hierarches**. All 7 examples with the hierarchical order of the Function/Case Hierarchy (23) violated the Animacy Hierarchy (21b). On the other hand, the counter-hierarchical combination DAT + ACC appeared three times, and in all these cases the Animacy Hierarchy was respected.

As for combinations with OBL WHs, there were 13 tokens found, where 12 followed the hierarchy proposed in (23), and only one was counter-hierarchical. In the examples below I illustrate combinations of PPs with NOM and ACC, i.e. those which were at least partially attested.

(34) **Hierarchical NOM + OBLm ACC + OBLm, DAT + OBL**

a. **Kdo** **s kým** hrál? CNC
who$_{NOM}$ with whom$_{INS}$ played
'Who played with whom?'

b. **Co** **s kým** znamená můj soucit? CNC
what$_{ACC}$ for whom$_{ACC}$ means my sympathy
'What does my sympathy mean for whom?'

(35) **Counter-hierarchical OBL + NOM and OBL + ACC**

a. **S kým** **kdo** hrál? CNC
with whom$_{INS}$ who$_{NOM}$ played
'Who played with whom?'

b. **Kým** **koho** potopit? CNC
who$_{INS}$ who$_{ACC}$ drown
'Who to drown (by means of) whom?'

In spite of the fact that Superiority seems respected in these combinations, and that the non-attested counter-hierarchical example (35a) is perceived as grammatical, the relevance of these data is hard to evaluate, because OBL includes subcategorized PPs. This conflation of pronominal OBL and PP appears to obscure the results – the categorial distinction between DP and PP represents in fact a characteristic which can influence the order of WHs. I will discuss this further in section 2.5.

2.4 Combinations with WH Adverbs

Meyer (2008) states[18] that with the exception of Russian, no reliable superiority-like preference could be demonstrated when testing the relative order between arguments (i.e. prevailingly pronominal WHs) and

18. He refers to Cheng (1991; 1997), Billings & Rudin (1996), and Dornisch (1998).

adjuncts (i.e. usually ADVs). In this section I provide data found in the Czech corpus which generally confirm his claim.

The examples in (36) and (37) illustrate the orders with corpus examples, with the exception of (37b) which was formed by the author and sounds fully grammatical.

(36) **Hierarchical NOM + Adv and ACC + Adv**

a. **Kdo z vás kdy** využil matiku? CNC
who$_{NOM}$ of you when used math
'Who used math when (= ever)?'

b. **Co jak dlouho** trvalo? CNC
what$_{ACC}$ how long lasted$_{3S}$
'What lasted how long?'

(37) **Counter-hierarchical Adv + NOM and Adv + ACC**

a. **Kam kdo** jel? CNC
where who$_{NOM}$ went$_{3S}$
'Who went where?'

b. **Kam co** poslali? CNC
where what$_{ACC}$ sent$_{3P}$
„What did they send where?'

As I stated in (24), there were 19 relevant combination of ADV combined with NOM and 11 with ACC. From all these 30 tokens, 22 combinations present the order pronoun + ADV, i.e. putting ADV in the non-initial position. Only 8 tokens presented ADV in the initial position. Moreover, such initial ADV are always in combination with NOM).

These numbers suggest that we may try to include ADV in the hierarchy in (23), by placing it below ACC. A more precise positioning of ADV in (23) would however require more detailed research.

The combination of two WH adverbs was virtually missing with only one example (38) found out of 120 tokens of two fronted WHs with no intervenor.[19]

(38) **ADV + ADV**

Kdy kde byl kancléř který...? CNC
when where was secretary who
'When and where was there a secretary who...?'

19. Rudin (1988) brings in a Czech example combining two with long distance moved adverbial WHs, where the structure is ungrammatical. However, it is not ungrammatical because multiple long distance WH movement is prohibited (as the author claims) but because two adverbial WHs do not combine even in a simple clauses. On the other hand, it is true that long distance WH movement is not acceptable in standard Czech, and that multiple WHs extraction is strongly degraded.

We will return to this fact in section 3.

2.5 Reconsidering the proposed hierarchies

In the preceding sections I have described the orders of two fronted WH constituents with no interfering element. We find that the most frequent combinations involve two case marked WH pronouns (DPs) followed by combinations of a pronoun with either another WH pronoun or an ADV. Although I found counterexamples for virtually every possible order, we saw that the ordering in multiple WH constituents fronted in Czech have a statistical tendency to respect the formal Function/Case Hierarchy proposed in (23) and modified with respect to ADVs in the preceding section.

(39) **The Revised Function/Case-based Hierarchy**
  a. NOM ⇒ ACC ⇒ DAT ⇒ OBL/PP
  b. NOM (ACC?) ⇒ ADV

As for the **animacy-based hierarchy**, the Czech corpus data did not show any significant compliance with the order proposed in Müller (1999) and given above in (21b). In (26) I summarised the lack of an animacy effect for NOM and ACC. As stated in Meyer (2008), this combination in fact shows a *reverse* animacy affect, violating at the same time both the Function/Case and Animacy Hierarchies. In (33) we saw that in combinations of ACC and DAT no corpus example respected both hierarchies at the same time – in the same time no example violated both of them.

Table in (40) provides the numbers and percentages for all the examples. The left side gives example numbers for the ordering animate + inanimate. When only pronominals are considered, i.e. those constituents which reflect a contrast between [+ANIM] and [-ANIM] as part of their categorial feature sets, there is no ordering preference. And this result remains the same even when we also include combinations with Adverbials as inanimates.

(40) **(In)Animacy characteristics**

40 tokens[20]	no intervenor Σ	%		no intervenor Σ	%
animate + inanimate	15	37,5	inanimate + animate	18	45
animate + ADV	4	10	ADV + animate	3	7,5
	19	47,5		21	52,5

When discussing earlier the OBL pronominals which include PP constituents, another factor emerged as relevant: the distinction between DP, a simple ADV and a PP containing [+WH]. Table (41) focuses on this distinction using a categorial label, although in Czech the number of free morphemes might be a better way to define it: while DP (and most ADV) are single word lexical entries of WH, a PP minimally contains two words.

The Table in (41) includes a hypothesis that multi-word PPs will prefer some position, either the initial or the final one, when they are paired with a one-word pronoun or ADV.

(41) **Categorial (?)/Size(?) distinction – DP/ADV/PP**

from 42 tokens[21]	Σ	%	examples		Σ	%	examples
$DP_{WH} + PP_{WH}$	10	23,8	(34a)	$PP_{WH} + DP_{WH}$	0		#(35a)
$Adv_{WH} + PP_{WH}$	0			$PP_{WH} + Adv_{WH}$	0		
$DP_{WH} + Adv_{WH}$	24	57,1	(36)	$Adv_{WH} + DP_{WH}$	8	19	(37)
less complex	34	80,9		more complex	8	19	

The numbers in Table (41) show that both PP and ADV tend to appear in the second position, while a WH pronominal occupies the initial position. Looking at the examples more closely, in the combinations with subcategorized OBL/PP, the initial WH is *always NOM* – the structures (including the not attested order) were in (34a) and (35a). The combinations with non-argumental Adverbs with NOM or ACC, both orders have already been illustrated in (36) and (37). The generalization concerning order between various categories (AP/AP/PP) which correlates

20. Excluding the combinations (in)animate +/& (in)animate and Adv+/&Adv. The symbol + marks a pair with no intervenor, the & symbol marks the coordinated couples.

21. Excluding the combinations DP+DP (73 tokens) and combinations with two Adj_{WH} (5 tokens).

with single-worder and multi-worded structures can be stated as in (42). Given that the word order in a VP is supposed to be V-DP-Adv-PP, it is a kind of natural sequence.

(42) **Category/Size based Sequence**
WH pronoun ⇒ ADV ⇒ PP

The data presented in this Chapter have demonstrated that the Superiority phenomenon is a statistically relevant concept for the fine-grained analysis of Czech multiple WH questions. The data found in the corpus show clearly that Czech structures are more sensitive to the formal characteristics of the WH constituents than to any semantic concept (namely animacy). In other words, in spite of the fact that violating formally defined Superiority does not in itself result in ungrammaticality (and no relevance of the feature [+ANIM] was attested), the number of hierarchically expected orderings was substantially higher than the when ordering of fronted WH constituents does not respect hierarchies defined in terms of morpho-syntactic characteristics (Function/Case and Category/Size).

3 Co-ordinate fronted WHs: corpus data

In the corpus data with combinations of two distinct WH elements separated by some intervenor, most of the examples represented coordinated structures. After excluding irrelevant examples, 130 tokens remained. As for the size of the structures, 39 were fragmental, with ellipses based on predicates in preceding clauses. The sentences containing predicates were not very long either. Assuming that the coordinated WHs represent one constituent, the length ranged between 4-6 words, longer than the sentences with two WHs with no intervenor discussed in the preceding Section. The coordinating conjunction was always *a* 'and'.

As to the kinds of constituents which were coordinated, the following table lists combinations with case-marked pronominals (or their equivalents) and ADVs.

(43) **The number of combinations with respect to their categorial/functional status**

combinations	number of tokens found
DP & DP[22]	6
DP & Adv // Adv & DP	37
Adv & Adv	87
Σ	130

The examples of coordinated WH elements found in corpus were organised to allow comparisons with respect to the same criteria as those used in the preceding section. The Table in (44) provides the order of case marked DPs, including the combinations with simple WH adverbs, to check the sensitivity to the Superiority factor, and assuming the hierarchies stated in terms of function/Case in (39). The left part of the table gives numbers (and percentages) of tokens in which the order of the coordinated WHs is hierarchical. The right part of the table gives the opposite, counter-hierarchical orderings.

(44) **The order of two fronted coordinated case-marked WH elements**

from 42 tokens[23]	Σ		Σ
NOManim-ACCinanim	1	ACC-NOM	0
NOManim-DATanim	1	DAT-NOM	0
NOMinanim-OBLinanim	1	OBL-NOM	0
ACC-OBL	0	OBL-ACC	0
ACC-DAT	0	DATanim-ACCinanim	2
NOM-ADV	23	ADV-NOM	1
ACC-ADV	4	ADV-ACC	4
DAT-ADV	1	ADV-DAT	3
OBL/PP + ADV	0	ADV-OBL/PP	1
hierarchical	31	**counter-hierarchical**	11

The number of examples of two co-ordinated WH pronominals is not only minimal but as we will see in the following section, such examples

22. DP includes subcategorized PP complements (= OBL), but the combination OBL + OBL is excluded.
23. Excluding combinations with no clear hierarchy, i.e. INS/OBL + PP/OBL (1) and ADV + ADV (87 tokens). OBL includes PP complements.

are also still questionably acceptable. Therefore, these numbers will not allow us to observe much of any syntactic (Function/Case based) hierarchy, and neither do they help us discuss the animacy criteria.

There are significantly more examples with Adv as one of the co-ordinates. Notice that in these examples, the hierarchical order is kept, especially in combination with NOM (23:1), i.e. with NOM it is fully comparable with the order attested for two pronominal WH constituents fronted with no intervenor, as seen in Table (24) above.

3.1 Coordinated Case-marked pronominals and combinations with Adverbs

Coordination requires functional as well as categorial compatibility. Therefore, it is not completely unacceptable to coordinate distinct arguments of one predicate even when they are categorially non-distinct nominals.

(45) a. *John and the book will buy.
b. *John will give the book and to Helen.

In Czech, a case marking language, the coordination of distinct functions would represent a coordination of constituents marked with distinct Cases, and such structures are bared on theoretical grounds. In the corpus I found six examples of co-ordinations, all of which represent marked structures. The best representatives are provided in (46). In (46a) both the coordinated NOM and ACC WH pronouns are arguments of the (moderately metaphorical but quite standard) ditransitive predicate *vytáhnout* 'pull out' (= obtain some information from somebody).

(46) a. **Kdo a co** ze mě vytáhne? CNC
who$_{NOM}$ and what$_{ACC}$ from me pulls
'Who pulls out what from me?'
b. ***Čím* a k čemu** se angažuje ten, kdo píše CNC
what$_{INS}$ and for what$_{DAT}$ $_{REFL}$ involves the$_{MS}$ who writes
'How and in what does one involve oneself when writing?'

The interrogative WHs in example (46b) are an Instrumental pronoun and a PP. They are complements of the predicate, although not obligatory. On the other hand, I cannot claim a syntactic hierarchy between an Instrumental and PP, so this example may confirm only the Category/Size sequence stated in (42).

Some other, more problematic examples of two coordinated WH (pro)nominals provided below in (47) are best analysed as ellipsis. The

multiple WH question in (47a) contains a DAT pronoun coordinated with an ACC noun phrase with interrogative adjective, and the two WH constituents together represent the whole clause. Crucially, there is no overt predicate in this fragment. The WH elements are related to the preceding clausal predicate *přinést* 'bring'.

(47) a. **[přináším světlo] - Komu** a **jaké světlo**? CNC
[bring$_{1S}$ light] - whom$_{DAT}$ and what light$_{ACC}$
'[I am bringing a light.] - 'What light and to whom?'

b. **[**nenapíšu] **- Komu** *a* **co**? CNC
[won't write] - whom$_{DAT}$ and what$_{ACC}$
'[I will not write] - 'What and to whom?'

The same is true about (47b) – the fragment contains again only WH pronominals in DAT and ACC, while the verb is in the preceding clause/ discourse.

The other examples found are even more non-standard. Both (48a/b) are not only fragments but – moreover – the WHs are not asking about arguments of any (preceding) verb. They question the characteristics of a noun understood from the preceding discourse.

(48) a. **[jako nevěra] - Čí** a **komu**? CNC
[like infidelity] - whose$_{POSS}$ and who$_{DAT}$
'Whose [infidelity] and to whom?'

b. **[o čem je řeč] - Jaká pokuta** a **za co**? CNC
[about what is talk] - what fine$_{NOM}$ and for what
'[what is he talking about?] – 'Which kind of fine and what for?'

To conclude, a (fronted) coordination of two arguments of one predicate is not attested in any significant number. Those which were found represent most likely some kind of ellipsis in larger structures.[24]

The logic which seems to predict the lack of coordinated constituents with distinct sentence functions would also predict the lack of coordination of pronominal arguments with adverbials. This prediction, however, is not borne out. As the Table (44) and the following examples show, these structures exist, their number is not minimal, and how to analyse them as elliptic is not obvious. The order of the WH elements in these structures shows a statistic preference to some orderings over others. In 23 out of 24 evaluated combinations of WH$_{NOM}$ and ab ADV the NOM element is first. On the other hand, combinations of ADV with

24. A detailed discussion of the ellipses containing the fronted WH constituents can be found in Gruet-Skrabalova (2011; 2016). A similar analysis is provided for Hungarian in Lipták (2003).

WH_{ACC} and WH_{DAT} did not show any special preference. Both orders exist and are rare; the structures with the ADV as the first conjunct only slightly prevail.

In the examples below I demonstrate the most frequent combinations. These were a NOM followed by as ADV and sum up to 23 tokens. As for the kind of Adverb, 9 tokens are comprised by the *Who and why* combination, and 8 were found with a temporal adverb. (49a/b) illustrate the prevailing order.

(49) **NOM & Adv combinations**

a. **Kdo a proč** zavraždil muráňskoho pána? CNC
who$_{NOM}$ and why murdered Muráň master
'Who murdered the master of Muráň and why?'

b. **Kdo a kdy** vyšetří smrt Anny Politkovské?
who$_{NOM}$ and when investigates death$_{ACC}$ Anna Politkovska$_{GEN}$
CNC: 'Who will investigate the death of Anna Politkovska and when?'

c. **[chtěl vás omámit] Proč a kdo?** CNC
Why and who$_{NOM}$
[wanted to intoxicate you] 'Why and who?'

The opposite order, i.e. Adv followed by NOM, was found only once, and this example (49c) is only a fragment.

Contrary to WH elements marked with NOM, when coordinated with ACC, the ADVs equally preceded or followed the pronominal (4:4). Examples of both orders are illustrated in (50a/b).

(50) **ACC & ADV combination**

a. **Koho a proč** sakra držíte jako rukojmí? CNC
who$_{ACC}$ and why expl hold$_{2P}$ as hostage
'Who do you hold for a damn hostage and why?'

b. **Kdy a co** budu jíst? CNC
when$_{ACC}$ and what$_{ACC}$ will$_{1P}$ eat
'What will I eat when?'

As for the DAT pronominals combined with Adverbs, only 4 examples were found, and the more frequent ordering (3:1) was with ADV in the initial position Both orders are demonstrated in (51a/b).

(51) **DAT & Adv combinations**

a. **Čeho a proč** se obával? CNC
what$_{DAT}$ and why REFL feared$_{3SM}$
'What did he fear and why?'

b. **Proč a komu** nadávala? CNC
why and who$_{DAT}$ call
'Who did she call names and why?'

To sum up: in the coordinated structures with a WH case-marked pronominal and Adverbial, the prevailing combination by far involved a WH pronoun marked with NOM followed by ADV – which is an order predicted by the hierarchy given in (39b). The combinations of ADV with ACC/DAT are not frequent enough to suggest a valid generalization.

3.2 Coordinated Adverbials

As listed in Table (43), the most frequent coordinated structure found in the corpus was a combination of two ADVs; there were 87 tokens from the total of 130 co-ordinations. Looking for a possible hierarchy among adjuncts, the Table in (53) specifies a least marked order typical for ADVs. It refers to semantic concepts but assuming that the variety of Adverbials is related to specific functional projections in the verbal domain, this order may reflect some syntactic hierarchy as well.

(52) A Hierarchy of Adverbials
PLACE ⇒ TIME ⇒ MANNER ⇒ REASON/why

Table (53) provides the numeric summary of the examples found in the corpus. The left columns list the 'hierarchical' orders and the right side those that are 'counter-hierarchical'.

(53) **The order of two fronted WH adverbials**

from 83 tokens[25]	Σ		Σ
PLACE-TIME	34	TIME-PLACE	34
TIME-MANNER	2	MANNER-TIME	1
PLACE-MANNER	1	MANNER-PLACE	0
MANNER-WHY	0	WHY-MANNER	1
PLACE-WHY	5	WHY-PLACE	3
TIME-WHY	1	WHY-TIME	1
hierarchical	43	counter-hierarchical	40

The numbers in (53) demonstrate that not all kinds of ADVs were equally represented in the corpus. The combination of Time and Place

25. Excluding combinations with two ADVs of the same kind (4 tokens).

very significantly prevailed. Among these two kinds of Adverbs, neither order prevailed; both were equally represented. The combinations involving the other adverbs were used less frequently and no statistically relevant preference was attested for any special ordering.

Examples of the combinations of two coordinated ADVs are given below. First, in (a) I exemplify the 'hierarchical' order and then ones that are counter-hierarchical. When the examples were not found in the corpus, I provide my own examples marked as #.

The Place & Time coordination represents the by far most frequent type of combination, and the order of Adverbs is the same for both options.

(54) **Place & Time combinations**

a. **Kde a kdy** to celé začíná? CNC
where and when it whole starts
'Where and when does it start?'

b. **Kdy a kde** vás najdeme? CNC
where and when you$_{ACC}$ find$_{1P}$
'Where and when will we find you?'

Combinations of Time/Place and Manner appears in the corpus minimally but in both orders. Below are two of the three examples found. They all belong to a higher literary style. In the corpus data, the manner adverbial is moreover represented not by a simple Adverb *jak* 'how', but usually by some more complex DP/PP structure.

(55) **Time & Manner combinations**

a. **Jak dlouho a do jaké míry** budou ...poplatníci
how often and to which extent will ...taxpayers
nalévat peníze...
pour money
CNC: 'How long and to which extent will the taxpayers pour money...'

b. **Jak dalece a na jak dlouho** ...může dát jistotu
how far and for how long ...can give confidence
láska?
love$_{NOM}$
CNC: 'To which extent and for how long can love give you confidence?'

(56) **Place & Manner combinations**

a. **Kde a jakým způsobem** lze získat objektivní CNC
where and which way can get objective
...informace?
...information
'Whete and in which way can one get objective information?'

b. ***Jak* a kde** se baví dnešní mládež CNC
where and how REFL entertains today's youth
#'Where and how do today's youth entertain themselves?'

There were several co-ordinations with a Place Adverb and *proč* 'why', and both orders are attested.

(57) **Place & *why* combinations**

a. **Kam a** proč příbuzní tvoji zabloudili? CNC
where and why relatives your get-lost$_{3P}$
'Where did your relatives get lost and why?'

b. **Proč a** kde jsi byla? CNC
why and where AUX$_{2S}$ been$_{SF}$
'Where have you been and why?'

To conclude: The co-ordinations of the Adverbials of Place and Time do not show any signal of a hierarchy. The few examples of two co-ordinated WH Adverbs distinct from the Place & Time are not simple WH Adverbs but complex PPs, and many are fragmental and feel like echo questions. In fact, they seem similar to the examples of two co-ordinated pronominals, i.e. those more acceptable examples mentioned in section 3.1 and analysed as co-ordinations of some larger (structurally compatible) constituents followed by ellipses.

With the multiple fronted WH constituents with no intervenor we have also considered the size and categorial label of the multiple WHs. The Table in (58), a parallel to (41), thus compares the numbers of case-marked pronominals (DPs), one-word Adverbs (Adv) and PPs, making a weak preliminary hypothesis that the multi-worded PPs will tend to appear in the second position. However, the categorial distinction does not always ideally correlate with complexity and therefore the theoretical relevance of these statistics remains vague as well.

(58) **Complexity and category of the coordinated WHs**

from 43 tokens[26].....	Σ	%	.....	Σ	%
$DP_{WH} + PP_{WH}$	4	9,3	$PP_{WH} + DP_{WH}$	0	0
$Adv_{WH} + PP_{WH}$	6	14	$PP_{WH} + Adv_{WH}$	0	0
$DP_{WH} + Adv_{WH}$	22	51,2	$Adv_{WH} + DP_{WH}$	11	25,6
less complex?	32	74,4	more complex?	11	25,6

The Table (58) shows that in co-ordinated structures, both PPs and Adverbs tend to become the second coordinate, with a WH pronominal in the initial position. Looking at the examples more closely, the combination with PP as the first coordinate did not appear at all, and the preference for the final position was absolute (the ratio 10:0). Such an example was illustrated above in (46b). The combinations of pronominals with Adverbs are comprised of NOM, ACC and DAT and all kinds of Advs. Both orders are attested in the coordinate structures, some illustrated in (49), (50) and (51) above. The order with the Adv in the second position was preferred in the ratio 2:1. This ratio confirms the generalization made by the Category/Size Sequence, i.e. the predicted orders for various categories (AP/AP/PP) and for single/multi-worded WH structures are as proposed in (42).

4 Hierarchies, Tendencies and Remaining Puzzles

Although it is not uncontroversial to assume similarity between coordinated structures and simple strings of multiple constituents, I did apply similar criteria when looking for the preferences in their orderings. The reason for this is based on the observation that the two structures seem to appear in a kind of complementary distribution which requires some explanation. First, however, let us compare the two structures with respect to the observed criteria and proposed hierarchies.

4.1 Formal Hierarchies

In the above sections I examined both the multiple WHs and the coordinated WHs found in the Czech corpus with respect to several formal hierarchies. The Superiority effects were tested based on the Function/Case Hierarchy given in (39) and is repeated below.

26. Excluding combinations with Adj_{WH} and DP + DP, and with Adv + Adj.

(59) **The Function/Case Hierarchy**
a. NOM ⇒ ACC ⇒ DAT ⇒ OBL/PP
b. NOM ⇒ ADV

Table (60) summarises the data from Tables (24) and (44) above. On the left there are the orders which can be called hierarchical: first for the non-coordinated multiple WH structures, then for the coordinated ones. On the right the same numbers are provided for the counter-hierarchical pairs.

(60) **The order of two fronted case-marked WH elements including co-ordinations**

Hierarchical pairs					**Counter-hierarchical pairs**				
	no intervenor		coordinated			no intervenor		coordinated	
	Σ	%	Σ	%		Σ	%	Σ	%
NOM-ACC	42	50	1	20	ACC-NOM	11	13,1	0	0
NOM-DAT	7	8,3	1	20	DAT-NOM	0	0	0	0
NOM-OBL	12	14,3	1	20	OBL-NOM	0	0	0	0
ACC-OBL	1	1,2	0	0	OBL-ACC	1	1,2	0	0
ACC-DAT	7	8,7	0	0	DAT-ACC	3	3,7	2	40
hierarchical	69	82	3	60	counter-hierarchical	15	18	2	40

Table (60) shows that with no intervenor, the two fronted WH pronominals are ordered according to the syntactic hierarchy in 82% of the examples. That is, only about 18% of the examples violate the hierarchy. With two fronted co-ordinated WHs the number of examples is minimal, but if percentages are counted, 60% of the examples comply with the hierarchy.

As for the combination of a pronominal WH and ADV in the lower part of the Table (61), we have a more comparable number of tokens in both groups and the results are thus more relevant. We can see that the number of examples of the two fronted WH elements with no intervenor complies with the hierarchy in 73,3% of the examples. With the co-ordinated couples the number of hierarchical pairs is almost the same, 75,7%.

(61) The order of two fronted case-marked WH elements including coordinations

Hierarchical pairs					**Counter-hierarchical pairs**				
	no intervenor		coordinated			no intervenor		coordinated	
	Σ	%	Σ	%	.....	Σ	%	Σ	%
NOM-ADV	11	36,7	23	62,2	ADV-NOM	8	36,7	1	2,7
ACC-ADV	11	36,7	4	10,8	ADV-ACC	0	0	4	10,8
DAT-ADV	0	0	1	2,7	ADV-DAT	0	0	3	8,1
OBL/PP + ADV	0	0	0	0	ADV-OBL/PP	0	0	1	2,7
hierarchical	22	73,3	28	75,7	counter-hierarchical	8	26,7	9	24,3

In the preceding sections, we also considered the orderings of a variety of constituents with respect to their category (and number of free morphemes, i.e. size). The tested distinction was between DPs, single Adv and PPs. The table below put together Tables (41) and (58). It shows that in both structures, if a PP is one of the WHs, it appears second. If ADV is one of the WHs, it tends to apear after the WH pronoun but in front of the PP.

(62) **Complexity / Categorial distinction – DP/ADV/PP**

Hierarchical pairs					**Counter-hierarchical pairs**				
42/43 tokens[27]	no intervenor		coordinated			no intervenor		coordinated	
	Σ	%	Σ	%	.....	Σ	%	Σ	%
$DP_{WH} + PP_{WH}$	10	23,8	4	9,3	$PP_{WH} + DP_{WH}$	0	0	0	0
$Adv_{WH} + PP_{WH}$	0	0	6	14	$PP_{WH} + Adv_{WH}$	0	0	0	0
$DP_{WH} + Adv_{WH}$	24	57,1	22	51,2	$Adv_{WH} + DP_{WH}$	8	19	11	25,6
less complex	34	80,9	32	74,4	more complex	8	19	11	25,6

The numbers in the above table demonstrate that in both observed structures, those orders were preferred which comply with the hierarchy given in (42) and repeated below.

(63) **Category/Size Sequence**
WH-pronoun ⇒ ADV ⇒ PP

27. Excluding combinations of DP + /&DP, Adv + /76Adv and WH adjective.

On the other hand, there were two hierarchies which were not found relevant for either the multiple WHs with no intervenor, or for the coordinated WHs. One was the Animacy Hierarchy preferring an animate to inanimate constituent, as given in (21b), and the other was a hierarchy assuming some order among ADVs, as proposed in (52) in section 3.2.

To conclude: the results for the validity of the proposed hierarchies were comparable for the multiple WHs with no intervenor and for coordinated WHs. In both instances, the evaluations were not a black and white distinction between grammatical and ungrammatical structures. More likely the data support the 'scalar view of the strength of superiority effects' proposed in (Meyer 2008:44) and mentioned above.

Notice, however, that although the evaluations were not black and white, the results were far from random and the regularities point to **formal** factors, not to semantic ones. Therefore, it appears that that the basis of the statistically attested preferences is to be at least partially explained within the grammatical theory.

4.2 The missing examples

I am not going to propose here some modification of the analyses, the WH movement analysis described in today's formal linguistic literature does not contradict the data found in the Czech corpus. The Split CP Hypothesis sketched in section 1.1, plausibly provides enough positions to host the multiple WHs and the several independent derivational steps are able to explain the flexibility of the constraints - some of them can be subject to individual speaker's (i.e. discourse) evaluations; others, however, may remain entirely formal.

The phenomena I want to bring out to the reader's attention are demonstrated in the Table below, which puts together Tables (22) and (43), i.e. shows numbers of attested combinations of two fronted WH constituents.

The two middle lines in (64b) demonstrate that the number of mixed combinations of WH pronominals and WH adverbs is equally frequent for both structures. The word orders - see also (61) - suggest that the two configurations reflect a comparable sensitivity to a hierarchy, preferring the pronoun (especially NOM) in the initial position. In other words, neither of the two structures represents any clear kind of more/less problematic or complex structure with respect to economy or the process of derivation. Moreover, the attested pairs with no intervenor signal that in the left clausal periphery there are minimally *two positions* which can host both arguments and adjuncts (both DPs and ADVs) – in any order.

(64) **The number of combinations with respect to their categorial/functional status**

	the [+WH] constituents	number of tokens found of two WHs with **no intervenor**	number of tokens found with two **co-ordinated** WHs
a.	pronoun +/& pronoun[28]	89	**6**
b.	pronoun (NOM?) +/& adverb	22	28
	adverb +/& pronoun (ACC?)	8	9
c.	adverb +/& adverb	**1**	87
		120	130

However, the first and last lines (64a) and (64c) show that this is not the entire truth. With two multiple WHs with no intervenor, the highly prevailing combinations is the one with two WH pronominals. The ADV pairs are virtually non-existent. And just the contrary, in the co-ordinated pairs, the by far prevailing combination is represented by two co-ordinated ADV, while the co-ordination of two WH pronominals is very rare, if any. What I want to highlight here is not the frequent attested patterns, but instead, I look for explanation of those patterns which are essentially missing – in Table (64) above I mark them in bold and grey.

As for the lack of two pronominals co-ordinations in (64a) on the right, I already mentioned in section 3.1 that their ungrammaticality may be explained in terms of a functional (Case) incompatibility or to some aspects of Theta Role assignments to different sentence functions. However, this type of argument fails to explain the grammaticality of the coordination of a WH pronominal and WH Adverb – the pairs which share neither category, nor sentence function nor theta role. Also the existing and frequent co-ordinations of two ADVs (AP/PP) in (64b) prove that a distinction in interpretation does not bar co-ordinations. I conclude that the WH constituents have to be coordinated on the basis of some shared feature. The [+WH] feature is plausibly such a feature, available with both WH pronominals and WH Adverbs.

Co-ordination of categorially distinct WHs can be demonstrated also for English, and the patterns is not that distinct from Czech. In (65a) we can see that two WH adjuncts can easily be coordinated (and fronted) in spite of the fact that full AP/PP with distinct interpretation cannot. The

28. The symbol + marks a pair with no intervenor, the & symbol marks the coordinated couples.

unacceptable (65b) repeats the fact that English is not a multiple WH language and (65c) show that the coordination is not that felicitous (if at all) with pronominals.

(65) Somebody visits Peter in his office all the time these days.
  a. Why and how often? - * Because of loneliness and 3 times a week.
  b. *Why how often?
  c.??Who and how often? *Who and whom?

Given that Czech is a multiple WH language, the complete lack of two WH Adverbials with no intervenor demonstrated in (64c) on the left – represents another puzzle. The only example found was given in (38) and it is quite controversial. In (66) below I provide my own combinations of two ADVs with no intervenor. The ?? signals that their status feels rather marginal, especially when compared with the same structures including a conjunction, while with the two co-ordinated structures taken from the corpus in () above, both orders were attested as acceptable and frequent enough.

(66) **Place & Time combinations**
  a.??**Kde** **kdy** to celé začíná?
    where when it whole starts
    'Where does it start when?'
  b.??**Kdy** **kde** vás najdeme?
    where when you$_{ACC}$ find$_{1P}$
    'When will we find you where?'

The availability of two (or more) WH pronouns and of a fronted WH pronoun and ADV with no intervenor (i.e. (66a/b) suggest that there must be more than one position in the Czech interrogative clause able to host a constituent marked for [+WH]. The present day analyses assuming the Split SP – those presented in Chapter 1.1 – is suitable because it is able to host the multiple WH easily.

We also saw above, that within the two initial positions the Superiority effects are respected only with animate pronominals, and only as a tendency. The violation of any formal hierarchy does not result in any serious degradation in grammaticality. This can be explained by some version of optimality parameters (as suggested in Meyer (2008)) but I prefer a more syntactic analysis. The Split CP is able to explain the lack of Superiority effects assuming the separate heads in the CP domain are endowed by a variety of features.

In Czech, with the word order which allows all arguments to be either pre- or post-verbal, the initial positions are not necessarily those marked

for the interrogative [+WH]. I follow the assumption that when analysing the multiple WH structures, we are dealing with minimally two separate triggering features: one attracts/ fronts the [+WH] constituents, and the other(s) is/are sensitive to some discourse characteristic(s). Looking more closely at those features, the [*u*WH] feature of C is always presented in current generative theory as a unique uninterpretable feature which does not allow multiple checking; in other words, it will be checked by a single WH constituent. On the other hand, the discourse feature(s) are plausibly subject to individual speaker's choice of Topic and/or Focus, and so may tolerate a recursive Merge. [29]

However, the lack of sequences of two fronted ADVs with no intervenor shows that with the multiple WH structures (at least in Czech) there are also morpho-syntactically definable constraints on possible combinations, which the proposed analyses do not explain. The data suggest that there is only *one* position is available for the ADV, and when two ADV are to be fronted, they have to get co-ordinated, i.e. located in one position.

On the other hand, because WH adverbs as well as WH pronominals can appear fronted in simple WH questions, I conclude that they both are able to check the [*u*WH] feature, which then becomes non-active in the rest of the derivation. If WH adverbs as well as WH pronominals are assumed to be able to Merge in the discourse related positions, too, there would be no restriction on the number of WH adverbs. Therefore, I propose that the discourse related features *do not attract ADV* – in other words, whenever ADV is fronted, it is checking the [*u*WH], and it cannot move to the alternative positions available for the WH pronominals.

The following list of functional heads in the leaft periphery is a restricted variety of the Split CP as in e.g. (9). It uses only labels which seem to me the least controversial. The middle one (the equivalent of Comp, here labelled as C) hosts the unique uninterpretable [*u*WH] feature. I assume that the [*u*WH] of C can be checked by either pronominals or ADVs, as long as they are marked for WH. The other two functional discourse heads, however, require specific reference, and therefore they can host only pronominals. Some kind of referential feature [+D] may enforce the choice. [30]

29. The term recursive may seem too strong here. Although the examples with more than one WH can be formed in Czech, there are not many in corpus and as represented well in the example (15), (16) and (17) – those often combine in situ and coordination. I did not find any relevant data in corpus concerning the sequences of more than two WH.

30. The label Topic for the topmost head is used because the very initial position seems to be occupied mostly by animate subjects (and subjects universally tend to Topics). The existence of the head Focus is assumed in most Slavic linguistic literature. The C projection may well be the head labelled as Int(erogative) in Turek (2012) – see (8) in

(67)

a.	Topic	- [Top]	- attracts only WH pronominal (preferably NOM)
b.	C	- [*u*WH]	- attracts any WH (pronominal or ADV)
c.	Focus	- [Foc]	- attracts only WH pronominal (preferably not NOM)

As for the characteristics of the Topic/Focus heads, it is tempting to accept the assumption that in Czech those heads are able to host also the non-interrogative constituents in declarative clauses. However, there is no restriction on the number of fronted (pre-verbal) Adverbials in Czech declaratives. Therefore the discourse features in the heads Topic and Focus in (67) seem to exclude the WH adverbials only. I have no interesting explanation for this fact.

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References

Adger, David. 2003. *Core syntax: A minimalist approach*. Oxford: Oxford University Press Oxford.

Alexopoulou, Theodora & Mary Baltazani. 2012. Focus in greek wh-questions? In Ivona Kučerová & Ad Neeleman (eds.), *Contrasts and positions in information structure*, 206–246. Cambridge: Cambridge University Press.

Baker, C.L. 1970. Notes on the description of english questions: the role of an abstract question morpheme. *Foundation of Language 6*. 197–219.

Bard, Ellen G, Dan Robertson & Antonella Sorace. 1996. Magnitude estimation of linguistic acceptability. *Language* 72(1). 32–68.

Billings, Loren & Catherine Rudin. 1996. Optimality and superiority: a new approach to multiple-wh ordering. *Proceedings of FASL* 3. 36–60.

Blaszczak, Joanna & Susann Fischer. 2001. *Multiple wh-konstruktionen im slavischen*. University of Potsdam.

Bolinger, Dwight L. 1978. Asking more than one thing at a time. In Henry Hiz (ed.), *Questions*, 107–150. Reidel, Dordrecht.

section 1.1.

Bošković, Željko. 1997. Superiority effects with multiple wh-fronting in serbo-croatian. *Lingua* 102(1). 1–20.

Bošković, Željko. 2002. On multiple wh-fronting. *Linguistic Inquiry* 33. 351–384.

Bošković, Željko. 2007. A note on wh-typology. In Peter Kosta & Lilia Schürcks (eds.), *Linguistic investigations into formal description of slavic languages: contributions of the sixth european conference held at potsdam university*, 159–170. Frankfurt am Main: Peter Lang.

Browne, Edward W. III. 1972. Conjoined question words and a limitation on english surface structures. *Linguistic Inquiry* 3. 223–226.

Cheng, Lisa Lai-Shen. 1991. *On the typology of wh-questions*. MIT dissertation.

Cheng, Lisa Lai-Shen. 1997. ”partial” wh-movement. *UCI Working Papers in Linguistics* 3. 27–50.

Chomsky, Noam. 1973. Conditions on transformations. In Stephen Anderson & Paul Kiparsky (eds.), *A festschrift for morris halle*, 232–286. New York: Holt, Rinehart & Winston.

Chomsky, Noam. 1977. On wh-movement. In Peter W. Culicover (ed.), *Formal syntax*, 71–132. New York: Academic Press.

Citko, Barbara. 1998. On multiple wh movement in slavic. In Željko Bošković, Steven Franks & William Snyder (eds.), *Formal approaches to slavic linguistics: the connecticut meeting*, 97–114. Ann Arbor, MI: University of Michigan Press.

Citko, Barbara & Kleanthes K Grohmann. 2000. The (non-)uniqueness of multiple wh fronting: german = bulgarian. In Tracy Holloway King Steven Franks & Michael Yadroff (eds.), *Formal approaches to slavic linguistics: the bloomington meeting*, 117–136. Ann Arbor, MI: University of Michigan Press.

Dayal, Veneeta. 2005. Multiple wh questions. In M. Everaert & H. van Riernsdijk (eds.), *Syntax companion 3, case #44*. Blackwell Publishers.

Dornisch, Ewa. 1998. *Multiple wh-questions in polish: the interactions between wh-phrases and clitics*. Cornell University dissertation.

Featherston, Sam. 2005. Universals and grammaticality: wh constraints in german and english. *Linguistics* 43(4). 667–711.

Grimshaw, Jane. 1979. Complement selection and the lexicon. *Linguistic Inquiry* 10(2). 279–326.

Gruet-Skrabalova, Hana. 2011. Czech questions with two wh-words. In Peter Kosta & Lilia Schürcks (eds.), *Formalization of grammar in slavic languages*, 179–192. Frankfurt am Main: Peter Lang.

Gruet-Skrabalova, Hana. 2016. Ellipsis in sequences of multiple wh-words. *Linguistica Brunensia* 64(1). Masarykova univerzita, Brno, 57–69.

Kuno, Sasumu & Jane J Robinson. 1972. Multiple wh questions. *Linguistic Inquiry.* 3(4). 463–487.

Lasnik, Howard & Mamoru Saito. 1984. On the nature of proper government. *Linguistic Inquiry* 15. 235–289.

Lipták, Aniko. 2003. Conjoined questions in hungarian. In Cedric Boeckx & Kleanthes K. Grohmann (eds.), *Multiple wh-fronting.* 141–160. Amsterdam: John Benjamins.

Meyer, Roland. 2008. Superiority effects in russian, polish and czech: judgments and grammar. *Cahiers linguistiques d'Ottawa* 32. 44–65.

Müller, Gereon. 1999. Optimality, markedness, and word order in german. *Linguistics*. 777–818.

Richards, Norvin. 2001. *Movement in language*. Oxford: Oxford University Press.

Rizzi, Luigi. 1997. The fine structure of the left periphery. In Liliane Haegeman (ed.), *Elements of grammar*, 281–337. Kluwer Academic Publishers.

Rizzi, Luigi. 2001. On the position int(errogative) in the left periphery of the clause. In Gugliermo Cinque & Gianpaolo Salvi (eds.), *Current studies in italian syntax: essays offered to lorenzo renzi*, vol. Vol 59:287-296 (North-Holland Linguistic Series: Linguistic Variations). Elsevier.

Ross, John. 1967. *Constraints on variables in syntax*. MIT dissertation.

Rudin, Catherine. 1988. On multiple questions and multiple wh fronting. *Natural Language & Linguistic Theory* 6. 445–501.

Sturgeon, Anne. 2008. *The left periphery: the interaction of syntax, pragmatics and prosody in czech*. Amsterdam: John Benjamins.

Toman, Jindřich. 1981. Aspects of multiple wh-movement in polish and czech. In Robert May & Jan Koster (eds.), *Levels of syntactic representation*, 293–302. Foris, Dordrecht.

Turek, Mariola. 2012. *Multiple spell-out approach to wh-fronting*. The University of York dissertation.

Veselovská, Ludmila. 1995. *Phrasal movement and x-morphology: word order parallels in czech and english nominal and verbal projections*. Palacký University, Olomouc dissertation.

Wachowicz, Krystyna A. 1974. Against the universality of a single wh-question movement. *Foundations of Language,* 11. 155–166.

Wachowicz, Krystyna A. 1978. Q-morpheme hypothesis. In Henry Hiz (ed.), *Questions*, 151–164. Reidel, Dordrecht.