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Anti-anti-homophony: Towards a syntactic account of "phonological" *wh*-cluster restrictions in Bulgarian

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ABSTRACT

It has often been claimed that clusters of *wh*-words in multiple *wh*-questions in Slavic languages are subject to a 'low-level PF constraint' against sequences of homophonous *wh*-words. This article revisits this claim in light of data from Bulgarian. We show that there is a substantial class of exceptions to this anti-homophony constraint in Bulgarian, and we claim that the generalization is that the putative constraint holds of simplex *wh*-words but not complex or D-linked *wh*-phrases. We propose a fully syntactic account of this generalization, in which the anti-homophony effect comes about when a probe attempts to interact with two or more goals with exactly the same features, and this is ruled out by a general condition against such derivations (the Principle of Minimal Compliance).

KEYWORDS · multiple wh-questions · haplology · PF interface · Bulgarian

1 INTRODUCTION

It has been claimed that a number of different constraints impact upon the range of possible *wh*-clusters in multiple *wh*-questions in languages such as Bulgarian. One constraint which explains much of the data is Superiority, which ensures that the *wh* corresponding to the most hierarchically superior argument must come first in the cluster, as demonstrated by examples such as (1).[1]

(1) a. Koj kakvo e kupil?
who what is bought
'Who bought what?'
b. *Kakvo koj e kupil?

However, Superiority doesn't explain everything. One observation which seems to require saying something extra is an apparent restriction on sequences of homophonous *wh*-words which was first noted by Billings & Rudin (1996) (henceforth abbreviated to B&R 1996).

This is illustrated in (2), which shows that a multiple *wh*-question involving two consecutive instances of *kakvo* "what" is unacceptable.

(2) *Kakvo kakvo obuslavlja?
what what conditions
'What conditions what?' (Bošković 2002:364)

This restriction is said to also hold for Bosnian/Croatian/Montenegrin/Serbian (BCMS), Polish, Russian, and Romanian by Bošković (2002). This restriction doesn't follow from Superiority, so it seems to require invoking some additional mechanism. B&R (1996) and Bošković (2002) propose an anti-homophony constraint which holds of multiple

[1] Unless stated otherwise, examples are in Bulgarian.

fronted *wh*-elements specifically; B&R (1996) call it STARHOM, for "*homophony". Throughout we will use the term "STARHOM effects" to describe effects such as (2).

There are also restrictions which seem to require reference to features such as [+animate] or [+human]. For example, animate subjects must precede other *wh*-phrases such as *wh*-adverbials, (3), whereas the order of inanimate subjects with respect to the same elements is unfixed, (4) (B&R 1996) .

(3) a. Koj kăde šte spi?
Who where MOD sleep
'Who will sleep where?'
b. *Kăde koj šte spi? (B&R 1996:41)

(4) a. Kakvo kăde te udari?
What where you.ACC hit
'What hit you where?'
b. Kăde kakvo te udari? (B&R 1996:55)

B&R (1996) capture this with an Optimality-Theoretic analysis where this difference between animate and inanimate subjects is learned from the input, with the rarity of multiple questions with inanimate subjects playing a role.[2] Whatever the restriction is, it doesn't obviously follow from Superiority, or indeed STARHOM, and on this account something is learned directly from the input to bring about the animacy effect.

While the restrictions we have just outlined may account for portions of the data, they are not equally explanatory. The Superiority-based explanation is in good theoretical standing, since Superiority most likely follows from general principles pertaining to locality. B&R (1996) may be right in claiming that the differences of the kind in (3)-(4) can be learned on the basis of positive input, even if the exact status of what it is that is learned from positive input remains to be determined (see e.g. Krapova & Cinque 2008 for some pertinent discussion). The theoretical status of the STARHOM constraint, however, is much less promising. Given that the constraint seems to be specific to *wh*-words (there is no language-general ban on adjacent homophonous words, in Bulgarian or elsewhere), the constraint, formulated as it is, cannot follow from fully general principles, and so it must be learned somehow. As it is a negative condition, prohibiting certain sequences, the only potential source of evidence for learners for STARHOM would come from indirect negative evidence, in particular the absence of homophonous *wh*-sequences in the input. But it is now well-established that indirect negative evidence is not used by the language acquirer in the acquisition process (see e.g. Yang 2015, 2016), so it is very difficult to see how STARHOM could ever be learned. Consequently, we should be extremely skeptical about STARHOM, and so we should want to explain its effects away by some other means.

Our goal in this paper is to provide an alternative explanation for STARHOM effects without making use of a potentially unlearnable PF constraint. Our empirical contribution is to show that STARHOM is not descriptively adequate for Bulgarian, and through a set of counter-examples we'll motivate an alternative analysis where what is crucial is whether the homophonous *wh*-elements move to the same projection; the counter-examples, we argue, involve the use of multiple distinct landing sites in the left periphery. We then propose a syntactic analysis of the core cases of STARHOM effects in terms of general conditions on Multiple Agree, with no role to play for PF in filtering illicit representations.

[2] In outline, they claim that there are constraints impacting upon subject placement whose effects are only seen in multiple *wh*-questions, and they propose that learners determine a ranking for those constraints with animate subjects on the basis of positive data in the input (i.e. multiple questions of the form (3-a)). With inanimate subjects there is no such positive data, as questions of the form in (3)-(4) are much more pragmatically esoteric and thus rarer than those of the kind in (1)), so the constraints remain unranked with inanimate subjects and thus both orders are possible.

2 EVIDENCE AGAINST THE PHONOLOGICAL CONSTRAINT

2.1 PREVIOUS DATA

STARHOM was motivated in B&R (1996) and Bošković (2002) by examples such as the following, which show that its effects are seen across various Slavic languages.

(5) *Koj na kogo kogo e pokazal?
who to whom whom is showed
intended: 'Who showed whom to whom?' (B&R 1996:43)

(6) *Kakvo kakvo obuslavlja?
what what conditions
intended: 'What conditions what? (Bošković 2002:364)

(7) *Čto čto obuslovilo? Russian
what what conditioned
intended: 'What conditioned what?' (Bošković 2002:364)

(8) *Ce ce precede? Romanian
what what precedes
intended: 'What precedes what?' (Bošković 2002:364)

(9) *Šta šta uslovljava? BCMS
what what conditions
intended: 'What conditions what?' (cf. Bošković 2002:364)

B&R (1996) and Bošković (2002) identify the constraint that accounts for the above as a "low-level PF constraint", and Bošković claims that when such a constraint is in effect, it becomes possible to leave the second of the two *wh*-phrases in situ; he calls this a "phonological exception" to the obligatoriness of multiple *wh*-fronting. Thus the following are all claimed to be acceptable, even though their counterparts with fronting are unacceptable.

(10) a. Koj na kogo e pokazal kogo? Bulgarian (Bošković 2002:367)
b. Kakvo obuslavlja kakvo? Bulgarian (Bošković 2002:364)
c. Čto obuslovilo čto? Russian (Bošković 2002:364)
d. Ce precede ce? Romanian (Bošković 2002:364)
e. Šta uslovljava šta? BCMS (cf. Bošković 2002:367)

Bošković analyzes these in terms of lower copy pronunciation, with substantial implications for how movement is to be modeled (see Nunes 2004, Corver & Nunes 2007). Our focus is on the "low-level PF constraint" component of the explanation, and in particular its status in Bulgarian, so we will largely put the effect in (5)-(9) vs (10) to one side.

2.2 THE DATA

2.2.1 REPLICATING **KAKVO KAKVO* AND **KOGO KOGO*

We initially sought to replicate Bošković's result with our Bulgarian speakers. First, we tested cases involving *kakvo kakvo*, and we sought to overcome the concern that the verb *obuslavlja* "conditions" was somewhat high register or literary. We tested a more concrete context: a bunch of stuff fell off of the shelves in your office, and while it was falling, some stuff hit other stuff. You ask, "What hit what?" The Bulgarian speakers we asked about this were uniformly uncomfortable with the *kakvo kakvo* sequence, (11-a), in line with (6) above. However, they also felt the same way about the case without multiple fronting in (11-b), contrary to what was expected on the basis of Bošković's data. Instead, speakers preferred the alternative in (12-a), where *kakvo* is replaced by a formally D-linked *wh*-phrase, despite the fact that there was no explicit linguistic context to link it to. The other order was not possible, (12-b).

(11) a. ?*Kakvo kakvo udari?
what what hit.PST
'What hit what?'
b. ?*Kakvo udari kakvo?
what hit.PST what
'What hit what?'

(12) a. Koe kakvo udari?
which.N what hit.PST
'What hit what?'
b. *Kakvo koe udari?
what which.N hit.PST
intended: 'What hit what?'

When we asked speakers informally to produce Bošković's "what conditions what?," they opted for *koe* as above as well. *Kakvo kakvo* did not seem to be an option, but neither did leaving the second *kakvo* in situ. Whatever the status of the in-situ option, we replicated **kakvo kakvo*.

Now to **kogo kogo*. Recall that this restriction was motivated by the unacceptability of (5), repeated here as (13), where the first *kogo* is in a PP; this contrasts with a case where the PP comes finally in the initial cluster, (14). The cases from the literature involve fronting of two objects from the same ditransitive *v*P, and we see that either order is possible with *kakvo* but not with *kogo* as the third member of the cluster. (The fact that both ordered are possible in (15)-(16) is taken by Richards (1997), Bošković (1997a, 2002), and others to follow from Superiority only restricting fronting of the initial *wh*P.)

(13) *Koj na kogo kogo e pokazal?
who to whom whom is showed
intended: 'Who showed whom to whom?' (B&R 1996: 43)

(14) Koj kogo na kogo e pokazal?
Who whom to whom is showed
'Who showed whom to whom?' (B&R 1996: 43)

(15) Koj na kogo kakvo e pokazal?
who to whom what is showed
'Who showed what to whom?' (Bošković 2002:366)

(16) Koj kakvo na kogo e pokazal?
who what to whom is showed
'Who showed what to whom?' (Bošković 2002:366)

The restriction in (13) seems to show that the trigger for unacceptability is the linear sequence, rather than having two local XPs of the same kind. This would seem to strongly favour a "low-level PF constraint" analysis.

We also replicated the judgment of (13), finding that speakers reject it on a neutral intonation. However, this example was improved significantly for some speakers with emphatic stress on *na kogo*. This is reminiscent of an observation from Bošković (2002:364, fn. 22), regarding the BCMS example in (9), where it is claimed that *šta* "can be marginally fronted [in the presence of another *šta* (added by authors)] if very heavily stressed". In addition, it seems that a similar degradation to that which is reported in (13) may hold in other cases where *na kogo* precedes some other animate *wh*-element other than *kogo*, as we see with (17-a). That is, the order *na kogo* $wh_{[+animate]}$ is generally degraded, independent of STARHOM-type environments, and this order improved by stressing or focusing the PP.

(17) a. ?*Koj na kogo koe momče e pokazal?
who to whom which boy is showed
'Who showed which boy to whom?'
b. Koj koe momče na kogo e pokazal?

Therefore it seems that the order PP-DP of (13) is bad for independent reasons not pertaining to the *kogo kogo* sequence specifically. Exactly what these restrictions should follow from is a matter for fuller investigation (see B&R 1996 and Krapova & Cinque 2008 for more on effects of animacy in particular), but until that is done in some detail, (13) can't be said to deliver the strong argument for STARHOM as a constraint on sequences that one might have thought it does.

Still, we can demonstrate that **kogo kogo* obtains in other contexts where both are just DPs, with no PP-related confounds to contend with and no other three-member cluster riders to consider either. We did this by testing environments where the two accusatives originate in different clauses, as in (18), and we found that speakers consistently rejected this example.

(18) *Koj kogo kogo nakara da udari?
who whom whom make.PST C hit
'Who made whom hit whom?'

Therefore we replicated **kogo kogo*, with a degree of uncertainty about the precise scope of the constraint.

2.2.2 TESTING *KOJ KOJ*

With the exception of a side remark in B&R 1996, no previous work seems to have considered sequences of *koj* "who.NOM". This can be tested straightforwardly in copular clauses. Our finding is that there is no restriction on these, and the judgements here are not subject to variation. The following examples illustrate.

(19) [Context: At a fancy costume party]
Koj koj e?
who who is
'Who's who?'

(20) Znaeš li koj koj e?
know Q who who is
'Do you know who is who?'

(21) Koj koj beše?
Who who was
'Who was who?'

One might consider the possibility that these examples show us that STARHOM effects don't hold in copula clauses. Three pieces of evidence indicate that this is not the case. First, the STARHOM effect holds in copular clauses with *kakvo*, (22), with *koe* once again emerging as an alternative.

(22) ?*Ne znam kakvo kakvo e.
no know what what is
'I don't know what is what'

(23) Ne znam koe kakvo e.
no know which.N what is.
'I don't know what is what'

Second, we can create examples involving long-distance extraction of *koj* from embedded clauses which result in two *koj* subjects occurring adjacent to one another, with no

copular clause involved. In such cases, there is no STARHOM effect, as (24) shows.

(24) Koj koj misli če sčupi vazata
who who think C broke vase.DEF
'Who thinks who broke the vase?'

Third, preliminary data indicates that the STARHOM effect holds in Romanian copular clauses with a form which is comparable to *koj*, which is *cine* "who.NOM".

(25) *Cine cine este? Romanian
who who is
'Who is who?' (Ioana Grosu, p.c.)

Therefore looks like what is special is *koj* in Bulgarian. But as we will see, it turns out that it's not so special after all.

Before moving on, we should address the one example of an acceptable *koj koj* sequence which has been mentioned in the previous literature. B&R (1996: 44) give (26) in parentheses and mention that it is possible in an "extremely colloquial" register, with the comment that one of the *koj*s is actually an accusative which is able to have the nominative form in this register.

(26) Koj koj trjabva da sluša?
who who has C obey
'Who has to obey who?'

B&R (1996: 44) discuss other cases of *kogo→koj* substitution in PPs in "Colloquial Bulgarian", see (27-a), and they report that *koj koj* is bad in those contexts, see (27-b). This contrasts with "Literary Bulgarian", in which *kogo* is used: no homophony obtains, so the constraint doesn't kick in, see (28-a)–(28-b).

(27) a. Koj na koj mu xaresva? Colloquial Bulgarian
Who.NOM to who.NOM CL.DAT.3SG is-pleasing.3SG
'Who is pleasing to who?'
b. *Na koj koj mu xaresva?
to who.NOM who.NOM CL.DAT.3SG is-pleasing.3SG
intended: 'Who is pleasing to who?'

(28) a. Koj na kogo mu xaresva? Literary Bulgarian
Who.NOM to who.ACC CL.DAT.3SG is-pleasing.3SG
'Who is pleasing to who?'
b. Na kogo koj mu xaresva?
to who.ACC who.NOM CL.DAT.3SG is-pleasing.3SG
'Who is pleasing to who?'

We do not offer an explanation of this dataset, but we report it for completeness. One thing to mention is that (28), which represent baselines of a sort for (27), are remarkable in themselves, in that they seem to demonstrate unexpected violations of Superiority. Thus something extra needs to be said about (28), and that might have a hand in explaining (27) without recourse to STARHOM. It is striking that the same constraint seems not to hold for (26), although our understanding of what this single example shows is somewhat limited.

Our new *koj koj* data in (19)-(24) seems not to be specific to any particular register, so whatever the status of (27-a), (19)-(24) remain a surprise for STARHOM, and they show it to be descriptively inadequate. (26) points in the same direction too.

2.2.3 D-LINKING AND NP ELLIPSIS

Another set of contexts where we can test sequences of homophonous *wh*-elements involves D-linked DPs with NP-ellipsis. Consider the following examples involving *koe* "which.N", which all of our speakers accepted.

(29) [Context: I'm looking out at the ocean horizon, and the sky and the sea look the same.]
Znam če ednoto e moreto i drugoto e nebeto. Koe Ø koe Ø e?
know C one is sea.DEF and other is sky.DEF which.N which.N is
'I know one of them is the sea and the other is the sky. Which is which?'

(30) Ne znam koe Ø koe Ø e.
NEG know which.N which.N is
'I don't know which is which'

Our speakers also accepted cases where the two adjacent homophones apparently have different syntactic structures. In these sentences, the first instance of a *wh*-phrase is an interrogative pronoun, and the second instance is a D-linked *wh*-phrase with gender agreement morphology.

(31) ?Koj koj film e gledal?
who which.M movie is watched
'Who watched what movie?'

(32) Pita li koj koj film e gledal?
ask Q who which.M movie is watched
'Did you ask who watched which movie?'

We encountered some judgment variation with (31) but not with (32), so it appears that embedding can improve some of these constructions for some speakers. Interestingly, NP-ellipsis is allowed for the D-linked *wh*-phrase. (34) is a naturally occurring example.

(33) ?Pita li koj koj Ø e gledal?
ask Q who which.M is watched
'Did you ask who watched which (one)?'

(34) [Context: A mother offers a daughter one of two bracelets, saying that she has been wearing both since they had not decided who wanted which bracelet. 'Bracelet' is feminine.]
Ne sme si izbrali koja koja Ø iska.
no is REFL chosen.1PL who.F which.F want
'We haven't decided who wants which (one)'

When two D-linked phrases are involved, and ellipsis is possible for both of them, we get homophonous sequences without unacceptability, see (38).

(35) Koe kote na koe kote pokaza?
Which.N kitten to which.N kitten show.PST
'Which kitten did you show to which kitten?'

(36) Koe Ø na koe Ø pokaza?
which.N to which.N show.PST
'Which (one) did you show to which (one)?'

(37) Na koe kote koe drugo kote pokaza?
to which.N kitten which.N other kitten show.PST
'To which kitten did you show which other kitten?'

(38) Na koe Ø koe Ø pokaza?
to which.N which.N show.PST
'To which (one) did you show which (one)?'

The ordering of direct and indirect objects in (37)-(38) is slightly less common than the ordering in (35)-(36), because it puts more focal emphasis on the indirect object. However, both are still acceptable, most likely due to the effect of D-linking in amnestying Superiority.

A similar experiment can be conducted with *kolko* "how many", although judgements on these examples are murkier. It seems that the variation has nothing to do with STARHOM effects, since the non-ellipsis examples are also marginal; rather, the problem with these examples is more likely due to some possibly general issue with multiple degree questions.

(39) ?Kolko momčeta kolko momičeta vidjaha včera?
how-many boy.PL how-many girl.PL see.PST yesterday
'How many boys saw how many girls yesterday?'

(40) ??Kolko Ø kolko momičeta vidjaha včera?
how-many how-many girl.PL see.PST yesterday
'How many saw how many girls yesterday?'

(41) ??A ot momčetata, kolko Ø kolko momičeta vidjaha včera?
what-about of boy.PL how-many how-many girl.PL see.PST yesterday
'And of the boys, how many saw how many girls yesterday?'

We will not return to these, given the uncertainty about the data, and we put multiple *wh*-adjunct questions to one side since they seem to have similar problems (*when did you think they'd arrive when?* is a very strange *wh*-question in English). Still, (39)-(41) seem compatible with the picture we have painted so far: homophonous sequences are not ruled out when they give rise to homophonous *wh*-sequences when at least one of the *wh*Ps is D-linked.

2.3 TAKING STOCK

To summarize, the only places where STARHOM appears to apply are in *kakvo kakvo* sequences and *kogo kogo* sequences. In copula clauses, constructions where the two homophones have different syntactic structures, and cases involving NP ellipsis of D-linked *wh*-phrases, the constraint is not observed.

3 A POSSIBLE SOLUTION

Recall that B&R (1996) propose that some phonological constraint STARHOM (for "*homophony") is at play in Bulgarian specifically. Given the foregoing, this constraint would need to be narrowed to only rule out *kakvo* and *kogo* sequences. We propose that if there is a phonological constraint in Bulgarian, it would look something like (42).[3]

(42) STARHOM: *[… [W_A] [W_A] …] iff $W_A \ni$ [C_{VELAR}V'C_{VELAR}V]
A homophonous sequence of words is banned iff the words contain two syllables initiated by velar sounds, with the stress on the second syllable.

While this is in principle formulable, it is very hard to see how such a negative constraint could ever be learned, especially when it is so narrowly circumscribed. As noted above, it would only be supported by indirect negative evidence, and there are many reasons to

[3]Note that the constraint cannot be as broad as to restrict all bisyllabic *wh*-words, since it did not obtain with *koja*.

believe learners do not use indirect negative evidence (see e.g. Yang 2015). We submit that (42) is simply not a plausible solution to the STARHOM effects in Bulgarian.

In support of STARHOM, B&R 1996 cite other cases of apparent anti-homophony constraints, such as the 'double-ING' constraint in English (**it is continuing raining*; Ross 1972), the "Stuttering Prohibition' in Turkic (a restriction against stacked genitive marking; Kornfilt 1986), and a restriction on multiple *si* clitic sequences in Italian (Napoli 1976). While these phenomena may at first seem to mount up to fuel the suspicion that there may be something general going on, most of them don't really involve anti-homophony and they have received subsequent explanations which don't appeal to anti-homophony constraints of any kind. For example, double-ING doesn't involve homophonous adjacent sequences, and it has received an alternative analysis in Richards (2010). On the Stuttering Prohibition and Turkic genitives, see O'Reilly-Brown (2023).[4] Given that there is abundant evidence that there is no general restriction on homophonous sequences in natural language (*if we had had the time...*, *I think that that is good*, the title of this article, etc.), such constraints should be eyed with elevated suspicion. We submit, then, that an alternative approach is needed.

4 TOWARD A SYNTACTIC GENERALIZATION: THE ROLE OF D-LINKING

The pattern that begins to emerge is that D-linked *wh*-phrases allow 'violations' of STARHOM, while non-D-linked *wh*-phrases do not. If this were the case, we could say that the unacceptability of *kakvo kakvo* and *kogo kogo* sequences is in fact due to the fact that *kakvo* and *kogo* don't get a D-linked interpretation.

The table 1 below lists each relevant *wh*-element, any possible morphological agreement marking it can exhibit, whether it is inherently D-linked, and whether it can 'violate' STARHOM.

Table 1:

wh-phrase	Translation	Case	Morphology	D-linked?	Can violate?
koj	who	NOM	No change (default masculine)	No	Yes
kogo	whom	OBL	No change	No	No
koj	which	—	Masculine: koj Feminine: koja Neutral: koe Plural: koi	Yes	Yes
kakvo	what	—	No change (default neutral)	No	No
kakâv	what (kind of)	—	Masculine: kakâv Feminine: kakva Neutral: kakvo Plural: kakvi	No	Yes? (%)

There are two obvious problems with this correlation. The first is with *koj* 'who.NOM', which, going by its translation, is not obviously D-linked, but it clearly allows STARHOM violations. However, this problem is quickly resolved when we consider the syncretism with the masculine *koj* 'which.M'. If *koj* 'who' is in fact part of the *koj* 'which' paradigm,

[4]Travis Major (p.c.) informs us that there are numerous minor problems with formulating the Stuttering Prohibition for Turkic. For example, in Turkish, it seems to cover cases where there is no true phonological identity between the component parts, once allomorphy is taken into consideration.

with an implicit masculine human subject like *čovek* 'person', then its allowance of homophonous sequences in fact patterns with D-linking: we can analyse instances of *koj* which violate the constraint as involving *koj čovek*, with a complex DP structure and NP-ellipsis of the head noun. This possibility was already hinted at when we saw the alternative realization of the impossible **kakvo kakvo* as *koe kakvo* above. Such an analysis is not possible for *cine* "who.NOM" in Romanian, since there is no syncretism between *cine* and any member of the *which* paradigm in Romanian, and so the fact that Romanian *cine* behaves differently with respect to STARHOM effects (as we saw above) makes sense too.

The second problem is with the *kakâv* 'what (kind of)' paradigm.[5] Though it is described as non-D-linked by e.g. Krapova & Cinque (2008), our speakers had mixed judgments about whether it could violate the anti-homophony constraint.

(43) %Njakakvi studenti kupiha njakakvi knigi no ne znam kakvi Ø
some-kind student.PL buy.PST some-kind book.PL but NEG know what-kind
kakvi Ø kupiha.
what-kind buy.PST
'Some students bought some books, but I don't know what kind (of students) bought what kind (of books).'

The problem here doesn't appear to be due to the sounds. The speakers who didn't accept (43) also did not accept sentences like (44), where a noun prevents the two instancs of *kakvo* from being adjacent, or even (45), where they do not have the same phonological form.

(44) %Kakva studentka kakva kniga kupi včera?
what-kind student.F what-kind book buy.PST yesterday
'What kind of student bought what kind of book yesterday?' [Possible answer: a physics student bought a red book.]

(45) %Njakakâv student kupi njakakva tetradka včera no ne znam
some-kind student buy.PST some-kind notebook yesterday but NEG know
kakâv Ø kakva Ø kupi.
what-kind what-kind buy.PST
'Some student bought some notebook yesterday, but I don't know what kind (of student) bought what kind (of notebook)'

These XPs are not D-linked in the sense that the restriction is linked to an established set of referents in the discourse, but they share a lot in common with the D-linked XPs: they are non-atomic, with full NP restrictors.

If we return to the table of relevant *wh*-words (Table 2), then, we find that the correlation between D-linking and violating the constraint is quite solid, at least if we assume that D-linked *wh*-phrases and *what kind NP*-type *wh*-phrases can be unified analytically.

[5]We put the syncretism between *kakvo* meaning "what" and "what-kind.N" to one side, for two reasons. First, unlike with *koj*, the two uses of *kakvo* have clearly distinguishable meanings. The sequence *kakvo* N can only mean "what kind of N", never "what/which N", so they are clearly distinguished in the right context. Second, there is no possible analysis of an isolated *kakvo* as involving a complex *wh*P with an elided noun because *kakvo* is unable to license ellipsis of its nominal complement:

(i) [Context: I bought a blanket (N).] Kakvo kupi?
what buy.PST / *what-kind Ø buy.PST
Intended: 'What kind (of blanket) did you buy?' Actual: 'What did you buy?'

We don't know why *kakvo* is restricted from being used in NP-ellipsis contexts.

Table 2:

wh-phrase	Translation	Case	Morphology	D-linked?	Can violate?
koj	who	NOM	No change (default masculine)	Yes	Yes
kogo	whom	OBL	No change	No	No
koj	which	—	Masculine: koj Feminine: koja Neutral: koe Plural: koi	Yes	Yes
kakvo	what	—	No change (default neutral)	No	No
kakâv	what (kind of)	—	Masculine: kakâv Feminine: kakva Neutral: kakvo Plural: kakvi	No?	%

5 PROPOSAL: WHY D-LINKING WOULD MATTER

We have established that identical *wh*-phrases can occur next to one another if at least one is D-linked, but identical non-D-linked *wh*-phrases cannot. Now we must consider how these phrases end up in such configurations to begin with.

In his dissertation, Richards (1997) proposed that multiple *wh*-movement occurs by moving *wh*-phrases to multiple specifiers of the relevant CP, using both Short Movement and Equidistance principles[6] to determine ordering – though, he notes, D-linked *wh*-phrases have more flexibility in ordering than non-D-linked *wh*-phrases. This is illustrated by (46)-(47), which are from Richards (and which we replicated with our consultants).

(46) a. Koj kogo e vidjal?
who whom AUX see.PST
'Who saw whom?'
b. *Kogo koj e vidjal?

(47) a. Koj profesor koja kniga e vidjal?
which professor which book AUX see.PST
'Which professor saw which book?'
b. ?Koja kniga koj profesor e vidjal?

However, allowing multiple specifiers poses problems for well-known theories of linearization (Kayne 1994) and reduces the restrictiveness of the theory (see e.g. Grohmann 2000).[7] We find it preferable to pursue an analysis similar to that of Rizzi (1997), where

[6] As Bailyn (2017) notes, it is theoretically questionable that we must make use of two distinct locality/economy principles to account for the multiple *wh*-fronting phenomenon.

[7] The popularity of dispensing with the ban on multiple specifiers, which was a feature of theories of phrase structure prior to Kayne (1993) (e.g. Jackendoff 1977), seems to largely be attributable to two factors: first, the success of the multiple specifier analyses of multiple *wh*-fronting from Richards (1997) and Bošković (1997b, 2002); second, the rise of the idea that *v*P, in whose specifier the external argument is commonly assumed to be first-merged, is a phase and which, by virtue of this fact, requires subextraction of any constituent from its complement domain to pass through its specifier (the phase edge). The first issue is the matter at hand, and we note that those analyses also require the theoretically unwelcome maneouvre of "tucking in", which remains one of the more severe departures from the theoretically principled position, enshrined in Chomsky's Extension Condition, that syntactic derivations proceed monotonically (see e.g. Bailyn 2017 for critical remarks). As for the second issue, the empirical evidence for the necessity of successive-cyclic stop-offs at the *v*P-edge, and thereby for the phasal analysis of *v*P, has been contested by Keine (2020) and Keine &

there are multiple CP-layer projections but they all have unique specifier positions. Relevant here is the claim in Bošković (2002) that D-linked *wh*-phrases in Bulgarian move to a different place than non-D-linked *wh*-phrases.[8] Krapova & Cinque (2008) formally propose an analysis, such that in the left periphery there exists an iterable projection[9] for D-linked *wh*-phrases that can be coindexed with a subsequent pronominal clitic, an iterable projection for D-linked *wh*-phrases that cannot, and a sole projection for non-D-linked *wh*-phrases below both (which can be assumed to be the traditional CP). The iterable projections for D-linked expressions are akin to the iterable TopP projections of Rizzi (1997), and the unique position for non-D-linked phrases can quite innocently be equated with the unique, non-iterable FocP projection of the same theory. Krapova & Cinque's proposed structure is reproduced in (48).

(48) $[XP_{\text{CL-D-LINKED}}\ [YP_{\textit{wh}\text{-D-LINKED}}\ [CP_{\textit{wh}\text{-non-D-LINKED}}\ [IP\ \ldots\ clXP\ ]]]]$

If Krapova & Cinque's analysis is correct, it provides a potential answer for the difference between D-linked and non-D-linked *wh*-phrase homophony: there are multiple possible places for D-linked *wh*-phrases to move to, but there is only one specifier position for non-D-linked phrases to move to. The reduced range of landing sites for non-D-linked *wh*-phrases makes them more restricted in their distribution, and thus we could conclude that the STARHOM effects are a result of that restriction: it is impossible to front multiple non-D-linked expressions because there is only one specifier for non-D-linked expressions. That is, *kakvo kakvo* is ruled out because it involves making use of multiple CP/FocP specifiers, whereas *koj koj* is possible because one of the *koj*s may be in one of the CP layers that's reserved for D-linked DPs, while the other could be in Spec,CP.

However, this account is empirically inadequate as things stand, since it leads us to expect that Bulgarian will never allow multiple *wh*-questions with several non-D-linked *wh*Ps. An immediate problem for this analysis is that *wh*-questions involving *kogo* and *kakvo* are possible, and these are both non-D-linked on our analysis.

(49) Kogo kakvo e udarilo?
whom what AUX hit.PST
'What hit who?' (B&R 1996:38)

(50) Kakvo kogo e udarilo?
what whom AUX hit.PST
'What hit who?' (B&R 1996:38)

If *kakvo* and *kogo* were competing for the same specifier position, this would be unexpected. However what is also unexpected is that both orders are possible, since (49) would seem to violate Superiority. Similar remarks hold of the other cases involving two non-D-linked *wh*-phrases cooccuring with *koj* that we saw earlier.

(51) Koj na kogo kakvo e pokazal?
who to whom what AUX showed
'Who showed what to whom?' (Bošković 2002:366)

(52) Koj kakvo na kogo e pokazal?
who what to whom AUX showed
'Who showed what to whom?' (Bošković 2002:366)

Zeijlstra (2025) (see those papers for further references). We suspect that the *v*P phase creates more problems than it solves, and so we would contest the idea that the mere idea of the *v*P phase constitutes a strong reason to reject the ban on multiple specifiers. As we see it, the jury is still out on whether multiple specifiers are an empirical necessity.

[8] The idea that D-linked *wh*-phrases and non-D-linked *wh*-phrases can have distinct merge positions is supported by the fact that in some Northern Italian varieties, such as Bellunese, the two types of *wh*-phrases occupy distinct positions: non-D-linked bare *wh*-phrases occur clause-internally, while D-linked *wh*-phrases occur left-peripherally (Munaro 1999, Bonan 2021).

[9] The iterability of these projections for D-linked expressions is likely connected to their topic-like properties and the fact that topic-hosting positions are iterable (Rizzi 1997).

While (51)-(52) follow from Richards' analysis, (49)-(50) does not. So there is more to understand about these cases, and we might hope that understanding them will reveal a unified analysis.

Taking these challenges on board, we would like to suggest an alternative account which is similar in spirit, in that it assumes that there are constraints on multiple fronting that stem from the unavailability of multiple specifiers, and which revives one of the core ideas in Rudin (1988), which is that in some cases multiple *wh*-fronting involves the fronted elements adjoining to form a single constituent in the CP domain. On our account, fronted non-D-linked *wh*-elements such as *kakvo* and *kogo* are smaller than D-linked *wh*-phrases, and as a result, they are clitic-like in their syntax. This means that they can be moved in the manner of a clitic, which in turn means that they can adjoin to C by some rule akin to head movement. We also assume, with Krapova & Cinque (2008), that D-linked *wh*-phrases move to the specifer of a higher, iterable projection (akin to TopP) which is specialized for D-linked phrases. For concreteness, we will assume the approach to clitics in Roberts (2010), where cliticization is not movement but rather a sort of side effect of an Agree configuration where the probe's features exhaust those on the goal, which happens when the goal is minimal and lacking a wider range of features or lexical material. However, as far as we know, nothing of direct relevance to the STARHOM effect hinges on this choice of theory.

Now let us spell out how this account will derive some basic *wh*-clusters. Assuming that phrasal movement to Spec,CP is also possible for all non-D-linked *wh*-elements, this means that a fronted non-D-linked *wh*-element can have two possible structural positions: it can be in Spec,CP, or it can be adjoined directly to C. We will assume, in line with Kayne (1994), that multiple head adjunction is not restricted in the same way that multiple specifiers are (although we return to this below); as a result, a simple example such as (50) could in principle be derived by multiple adjunction of the *wh*-elements to C, as in (53).

(53) $[_{CP}\ [_{C'}\ [_{C}\ \text{kakvo}_i\ [_{C}\ \text{kogo}_j\ \text{C}\ ]]\ [_{TP}\ \dots\ t_i\ \dots\ t_j\ \dots\ ]]]$

The same string could be derived by head adjunction of *kogo* to C and movement of *kakvo* to Spec,CP, as in (54).

(54) $[_{CP}\ \text{kakvo}_i\ [_{C'}\ [_{C}\ \text{kogo}_j\ \text{C}\ ]\ [_{TP}\ \dots\ t_i\ \dots\ t_j\ \dots\ ]]]$

Finally, we assume that *wh*-movement to C, whether it involves cliticization or movement to Spec, is to be understood in probe/goal terms, with C bearing the relevant probe.

With these components in hand, we propose that the difference between those *wh*-elements that trigger STARHOM effects, such as *kakvo*, and those that don't, such as *koj*, is that movement of multiple *koj*-class *wh*-elements may involve fronting to multiple distinct projections, for instance two of the iterable YP projections of Krapova and Cinque's proposal, as in (55), whereas movement of the *kogo*-class involves one head, namely C, attempting to interact with two elements with the same feature content.

(55) $[_{YP}\ \ Y\ [_{YP}\ \ Y\ [_{CP}\ \ C\ [_{TP}\ \textit{koj}\ \dots\ [_{VP}\ V\ \textit{koj}\ ]]]]]$

(56) $[_{CP}\ \ C\ \dots\ [_{TP}\ \textit{kakvo}\ \dots\ [_{VP}\ V\ \textit{kakvo}\ ]]]]]$

We do not rule out an alternative version of (55) where one of the *koj*s moves to Spec,YP and the other to Spec,CP, but we will set this option aside for now.

Putting things more abstractly, the bad cases involve multiple Agree with two identical goals (see e.g. Nevins 2011), whereas the good cases involve two instances of unitary Agree with distinct heads. This, we claim, is why they differ with respect to the STARHOM effect. A necessary component of any implementation of Multiple Agree is some principle that ensures that once a goal has been Agreed with, it can be ignored when the probe

searches its domain the second time; otherwise, the probe would repeatedly find the first goal and never look past it to find the second, lower goal. This principle is made explicit in Richards (1997), Rackowski & Richards (2005) and (van Urk & Richards 2015:142) as the Principle of Minimal Compliance (PMC):

(57) *Principle of Minimal Compliance*
Once a probe P Agrees with a goal G, P can ignore G for the rest of the derivation.

We propose that a side-effect of the PMC is that when a probe searches a second time and finds a second goal which is featurally indistinct from the first one, the probe ignores the second goal just like it ignores the first, since it has no featural means by which to distinguish them.[10] As a result, the probe is incapable of moving the second goal to CP, and so multiple fronting is underivable. On this account, it is the indistinctness of features, rather than indistinctness of forms, that brings about the problem.[11] We need not appeal to PF filters or any such mechanisms, as the effect follows straightforwardly from the basic mechanisms that we require to get Multiple Agree to work.

Our syntactic account of STARHOM effects makes some predictions that are not made by the PF-based analyses. We discuss one here concerning adjacency: on our account, it is predicted that linear adjacency should not be a crucial determinant of STARHOM effects, as what is crucial for us is that the relevant *wh*-elements move to the same projection, attracted by the same probe. Thus if we consider three-member clusters where two of the members are identical but separated from each other by another *wh*-element, our account predicts that they should be bad, whereas a PF-filter account which rules out adjacent sequences of *wh*-elements clearly does not make any such prediction. We can test this with examples involving just *kogo* and *kakvo*, where we control for Superiority as an independent factor, and indeed we find that such clusters are substantially degraded, as in (58). As an alternative, speakers offered variants where one of the *wh*-proforms was substituted for a D-linked *wh*-phrase (a strategy we mention above).

(58) [Context: there are three people in your office, and stuff started falling off the shelves; some stuff knocked into one person, which made them fall over and hit some more stuff. I want to know what object made which person hit what other object.]
?* Kakvo kogo kakvo nakara da udari?
what whom what made C hit
'What made who hit what?'

We found that this effect also obtained with object control verbs, such as *ubedi* "convinced" and *prinudi* "forced".

(59) ?*Kakvo kogo kakvo ubedi da napravi?
what whom what convinced C do
'What convinced who to do what?'

(60) ?*Kakvo kogo kakvo prinudi da kupi?
what whom what forced C do
'What convinced who to do what?'

In the absence of an alternative explanation, these examples indicate that adjacency within the *wh*-cluster is not a determining factor for STARHOM effects in Bulgarian.

Let us walk through how our proposal explains these examples. Using the basic ingredients of our account, these examples would require movement of the initial *kakvo*

[10] See Collins & Groat (2018) for relevant discussion of the difficulties involved in distinguishing between copies and repetitions in a Minimalist theory.

[11] This requires the assumption that subject and object variants of *kakvo* are not distinguishable with respect to case features; in other words, syncretism reflects featural nondistinctness. This assumption is well-motivated by work on syncretism and ATB extraction such as Citko (2005).

to Spec,CP and adjunction of *kogo* and the second *kakvo* to C, and so C would probe three times. However, we expect that when C probes a third time, probing past the higher two arguments that it has already Agreed with (as per the PMC), it would be unable to find the lower occurrence of *kakvo*, since it would have found another *kakvo* when it probed the very first time. It is not obvious what else rules this example out, and it contrasts clearly with a variant where the matrix subject is *koj*.

(61) Koj kogo kakvo nakara da udari?
who whom what made C hit
'Who made who hit what?'

Our account may appear to automatically derive the effect, noted in Bošković (2002) and discussed in reference to (10) above, where the second *wh*-element can exceptionally be pronounced in its base position. We do not hasten towards such a conclusion, however, for three reasons. First, we noted that the empirical picture with respect to this effect is not as clear-cut as we expected, since some of our Bulgarian speakers rejected the in-situ variants. More work needs to be done to explore what affects the judgments on these cases. Second, it is tempting to generalize our account to the **si si* restriction on multiple identical clitics in Romance that we mentioned above, but in doing so we would run into the problem of allowing unfronted clitics to exceptionally occur in their base position in haplology contexts. Third, there are theoretical questions regarding what happens with *wh*-elements that do not end up being Agreed with due to the effects of the PMC; do they not bear features which need to be Agreed with? Do they bear focus features? This cluster of issues gives us reason to forestall fuller discussion of the in-situ effect for future work.

Before moving on, we should mention some other effects of adjacency which are also discussed in Rudin (1988) and Bošković (2002), where it is noted that *wh*-clusters can be broken up by parentheticals and adverbials in languages such as BCMS and Polish but not Bulgarian and Romanian.

(62) *Zavisi ot tova, koj pr̆v kogo e udaril.
depends on this who first whom has hit
'It depends on who hit who first' (Rudin 1988:467)

(63) Ko je prvi koga udario? BCMS
who has first whom hit
'Who has hit who first?' (Rudin 1988:467)

Rudin argued that the possibility of breaking up the *wh*-cluster correlates with the absence of Superiority effects – Polish and BCMS lack Superiority effects in matrix questions, Bulgarian and Romanian exhibit them – and explains the effect in terms of two distinct syntactic configurations for the clusters formed in the different languages. This is relevant for our purposes because Bošković (2002) notes that inserting an adverb between two *wh*-elements alleviates STARHOM effects in BCMS, as in (64), and he takes this to indicate that the effect is conditioned by adjacency.

(64) Šta neprestano šta uslovljava?
what constantly what conditions
'What constantly conditions what?' (Bošković 2002:364)

The fact that Bulgarian and Romanian typically[12] don't allow anything to break up the *wh*-cluster is a confound for testing whether the same adjacency rider on STARHOM that is claimed to be evidenced by (63) is observable in those languages. One thing that is unclear from (63) is whether it is really true that both *wh*-words have actually been

[12] Rudin (1988:468) mentions that the empirical situation is somewhat murky, saying that "speakers give unclear and somewhat contradictory judgments" on examples where the *wh*-cluster is broken up by a parenthetical, and also on examples where the parenthetical follows the cluster.

fronted, as an analytical possibility that the second *wh* is actually an unfronted in-situ subject (or scrambled object). We leave the matter for future research.

6 CONCLUSION

We have shown that the apparent ban on homophonous *wh*-sequences in Bulgarian has a number of exceptions, and we have shown the exceptions to be principled: they all involve at least one D-linked or non-atomic *wh*-expression. We sought to explain this in terms of an analysis where there are multiple positions for D-linked *wh*-phrases, but fewer for non-D-linked phrases, and we outlined a proposal for how the restriction comes about with clusters of non-D-linked *wh*-phrases, using a version of Rudin's (1988) cliticization analysis combined with Roberts' (2010) theory of clitics. Insofar as the preceding analysis is successful, we hope that it may lay the foundation for a meaningful rethink of how Superiority effects, and their amnestying in certain circumstances, are to be explained.

ABBREVIATIONS

ACC	accusative	M	masculine
AGR	agreement	MOD	modal
AUX	auxilliary	N	neuter
BCMS	Bosnian/Croatian/-Montenegrin/Serbian	NOM	nominative
		OBL	oblique
B&R (1996)	Billings & Rudin (1996)	PL	plural
CL	clitic	PMC	Principle of Minimal Compliance
C	complementizer	PST	past
DAT	dative	Q	question particle
F	feminine	SG	singular
GEN	genitive		

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