

CONJUNCTION SAVES MULTIPLE SLUICING: HOW *(AND) WHY?

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1. INTRODUCTION

Coordination improves otherwise illegitimate strings (Kazenin 2002; Whitman 2002, 2004; Gračanin-Yuksek 2007; Gribanova 2009; Scott 2012; Citko and Gračanin-Yuksek 2013, 2016, among many others):

- (1) a. ***When where** did you see John?
b. **When and where** did you see John?
- (2) a. *Let me know **if when** you see John.
b. Let me know **if and when** you see John.

In this talk, we are interested in a similar contrast, which emerges in multiple sluicing (Bolinger 1972; Hoyt and Teodorescu 2012):

- (3) a. ?*Someone saw something, but I can't remember **who what**. (Lasnik 2014: 8)
b. Someone saw something, but I can't remember **who or what**.

We investigate possible sources for coordinated sluices (4a), and show that they cannot be derived from coordinated wh-questions (4b), multiple sluices (4c), or clefts (4d).

- (4) a. I know John taught someone something, but I can't remember **whom or what**.
Coordinated Sluicing
- b. I know John taught someone something, I can't remember **whom or what John taught**.
Coordinated Wh-Questions
- c. ??I know John taught someone something, but I can't remember **whom what?** *Multiple Sluicing*
- d. I know John taught someone something, but I can't remember **who** it was *Coordinated Clefts*
or what it was.

We propose that the coordinated sluice in (3b) involves coordination of two CPs, with a single wh-phrase sluiced in each, as illustrated in (5).

- (5) Someone saw something, but I can't remember *Coordinated Sluicing*
[CP1 **who**; [TP1 ~~t~~ saw something]] or [CP2 **what**; [TP2 they saw ~~t~~]]

2. COORDINATED WH-QUESTIONS AS A POSSIBLE SOURCE FOR COORDINATED SLUICING

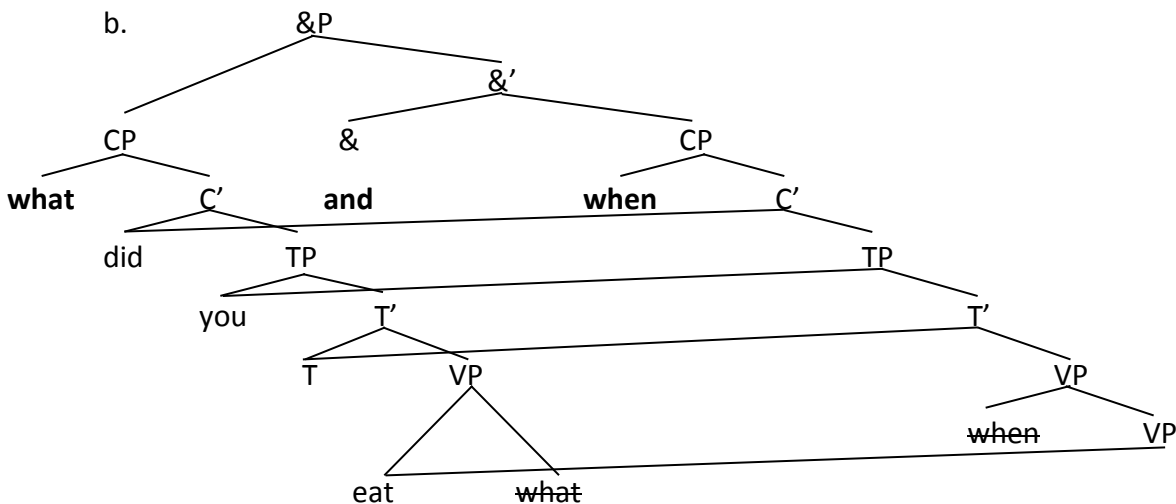
Coordinated Wh-questions (**CWHs**) are questions in which two wh-phrases, not necessarily of the same category, are conjoined in a left-peripheral position.

- (6) a. [_{AdvP} **When**] and [_{AdvP} **where**] were you born?
 b. [_{NP} **Who**] and [_{Adv} **when**] did you teach?

In English, CWHs are subject to a number of restrictions (Kazenin 2002; Whitman 2002, 2004; Gračanin-Yuksek 2007, Gribanova 2009; Scott 2012; Citko and Gračanin-Yuksek 2013, 2016, among many others).

In order to capture these restrictions Gračanin-Yuksek (2007) and Citko and Gračanin-Yuksek (2013) propose the *bi-clausal non-bulk sharing structure* in (7). This structure involves coordinated interrogative clauses which *share* everything *except for* the wh-phrases.

- (7) a. **What and when** did you eat?



In (7b), *when* is not part of the first conjunct and *what* is not part of the second conjunct. However, the CWH is grammatical because the first conjunct is grammatical without *when* and the second conjunct is grammatical without *what*. This structure captures the following facts:

CWHs are ungrammatical if coordination involves two wh-arguments. This is shown in (8a-b); the verb *put* requires two VP internal arguments, but it has *only one* per conjunct. Thus, its selectional requirements are not satisfied in *either* conjunct.

- (8) a. ***What and where** did you put?
 b. ***What** did you put and **where** did you put?

CWHs are ungrammatical if the verb is obligatorily transitive and one of the wh-phrases is an adjunct, and the other one is a direct object. Thus, (9a) with an optionally transitive verb *eat* contrasts with (10a), which has an obligatorily transitive verb *buy*.

- (9) a. **What and when** did you eat? ✓ Optionally transitive V; *wh-DO* & *wh-adjunct*
 b. **What** did you eat **and when** did you eat?

- (10) a. ***What and when** did you buy? *Obligatorily transitive V; *wh-DO* & *wh-adjunct*
 b. ***What** did you buy and **when** did you buy.

CWH are ungrammatical if they contain a wh-subject. This follows because all clauses in English require an overt subject, so a clausal conjunct without a subject always leads to ungrammaticality, as illustrated in (11).

- (11) a. ***Who and when** sang?
 b. ***Who** sang and where sang?

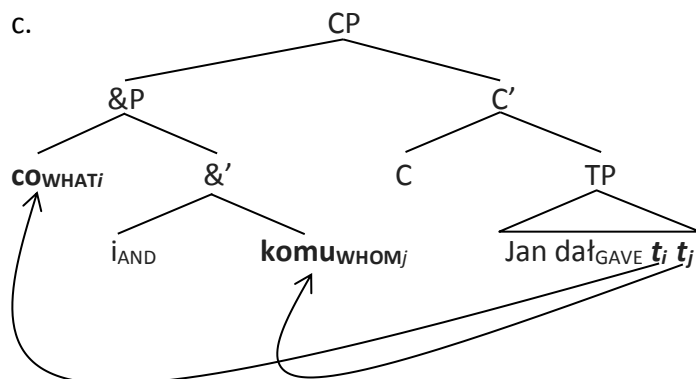
Finally, **CWHs are interpreted as two coordinated wh-questions with a single wh-pronoun in each.** CWHs in which one of the wh-phrases is a direct object and the other one an adjunct, as in (12a), have the so-called *at-all* reading, given in (12b) (possibly the only reading allowed by CWHs in English), on which the wh-object is *not* part of the interpretation of the question introduced by the wh-adjunct. Since the wh-object is not part of the conjunct introduced by the wh-adjunct, the verb *ate* in the *where*-conjunct is interpreted intransitively, giving rise to the *at-all* reading.

- (12) a. I know **what and where** you ate.
 b. I know **what** you ate and **where** you ate *at all*. *At-all reading*
 c. %I know **what** you ate and **where** you ate *it/the thing you ate*. *It reading*

An Aside: Mono-Clause CWHs

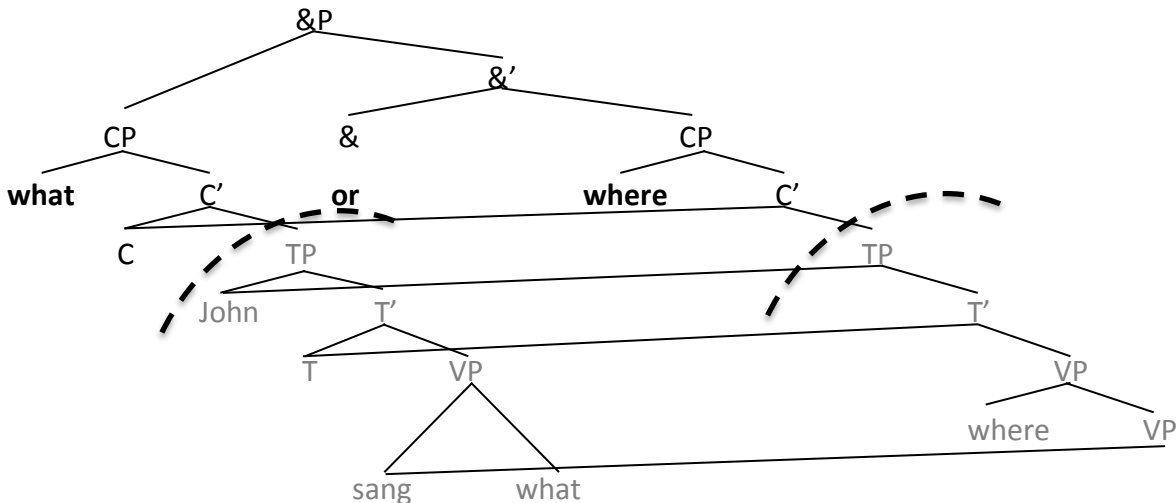
The bi-clausal structure in (7b) is the only structure for CWHs in English. Multiply wh-fronting languages, which allow obligatory arguments to appear in CWHs, as shown in (13a-b), have an alternative mono-clausal structure for CWHs, shown in (13c). In (13c), the two wh-phrases undergo sideways wh-movement to merge with the Coordination Phrase (Nunes 2001, 2004; Zhang 2007, 2010).

- (13) a. **Co** **i** **komu** Jan **dał**? *Polish*
 what and whom Jan gave
 Lit. 'What and to whom Jan gave?'
- b. **Što** **i** **kome** Jan **daje**? *Croatian*
 what and whom Jan gives
 Lit. 'What and to whom is Jan giving?'



Can coordinated sluicing be derived from the structure in (7b), with ellipsis targeting the TP nodes of the two coordinated CPs, as in (14)?

- (14) a. I know John sang something at some event, but I don't remember **what or where**.
 b. ...but I don't remember



This analysis predicts that CWHs and coordinated sluices should be subject to the same restrictions; however, this is not the case.

2.1. AGAINST COORDINATED WH-QUESTIONS AS THE SOURCE OF COORDINATED SLUICING

Coordinated sluicing and CWHs differ in several respects.

Coordination of obligatory arguments is impossible in CWHs, but possible in coordinated sluicing:

- (15) a. *Do you know **what and to whom** John gave?
 b. I heard that John gave something to someone. Do you know **what and to whom**?

In CWHs involving obligatory transitive verbs, coordination of a wh-object with a wh-adjunct is impossible. No such restriction holds of coordinated sluicing:

- (16) a. *Do you know **what or when** John bought?
 b. I know that John bought something some time last week, but I don't remember **what or when**.

Coordination cannot involve a subject wh-phrase in CWHs, but it *can* in coordinated sluicing:

- (17) a. *Do you know **who and when** ate?
 b. I know that someone ate at some point. Can you tell me **who and when**?

Unlike English CWHs (18), coordinated sluicing does not have the *at-all* reading, and has only the so-called *it* reading, as shown in (19b-c). This indicates that the wh-phrase introducing the first conjunct in a coordinate sluice is interpreted in the second conjunct.

- (18) a. **What and where** did John sing?
 b. **What** did John sing and **where** did John sing *at all*? *At-all reading*
- (19) a. I heard that John sang something, but I forgot **what and where**.
 b. # ... but I forgot **what** John sang and **where** he sang *at all*. *At-all reading*
 c. ... but I forgot **what** John sang and **where** he sang *it*. *It reading*

All these differences between CWHs and coordinated sluicing lead us to conclude that **coordinated sluices are not derived from CWHs**.

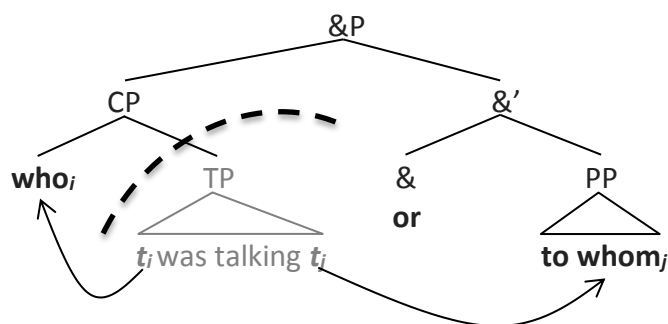
3. MULTIPLE SLUICING AS A POSSIBLE SOURCE FOR COORDINATED SLUICING

Multiple sluicing in English has been analyzed in various ways. On one analysis (Nishigauchi 1998; Lasnik 2007, 2014), the first wh-phrase in a multiple sluicing configuration moves leftwards to [Spec CP], while the second one is extraposed/moved rightwards to an adjoined position.

- (20) a. Someone was talking (yesterday) to someone, but I don't know **who to who**. (Lasnik 2014: 9)
 b. ... but I don't know **who_i [_{t_i was talking t_j(yesterday)] to who_j}**.

If (20b) is the correct analysis of multiple sluicing, it is difficult to imagine how coordinated sluicing could be derived in an analogous way. One implementation of this idea is given in (21b). However, it violates the Law of the Coordination of Likes (Williams 1981): it involves coordination of a CP with a PP.

- (21) a. Someone was talking (yesterday) to someone, but I don't know **who or to whom**.
 b. ...but I don't know...



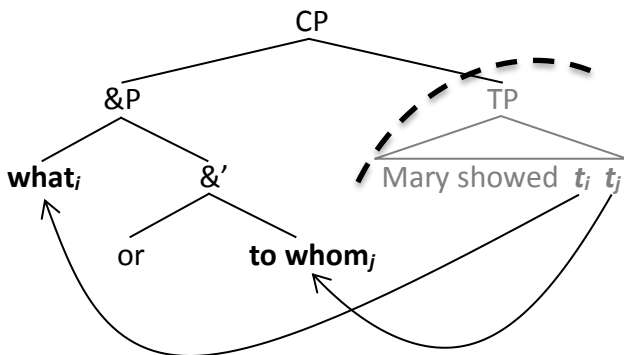
Another prominent analysis of multiple sluicing in English involves multiple leftward movement to [Spec CP] (Merchant 2001; Richards 2001, 2010; Park and Kang 2007; Abels and Dayal 2017a, 2017b), as shown in (22b).

- (22) a. [?]Mary showed something to someone, but I don't know exactly **what to whom**. (Park and Kang 2007: 396)
 b. ...but I don't know exactly [_{CP} **what_i** [_{C'} **to whom_j** [_{TP} **Mary showed t_i t_j**]]]

These authors propose that multiple *overt* wh-fronting in English is allowed in the case of sluicing because the deletion of the TP removes the violation induced by the pronunciation of the highest copy of the second wh-phrase: Ellipsis removes lower copies of both wh-phrases from the structure, so the remaining copies count as simultaneously *highest* and *lowest*.

If coordinated sluices were derived from multiple sluices and multiple sluices involve the structure in (22b), coordinated sluices would presumably involve sideways movement of wh-phrases to form a Coordination Phrase in [Spec CP] (Zhang 2007, 2010), followed by the deletion of the TP in which the wh-phrases originated, as shown in (23b).¹

- (23) a. ?Mary showed something to someone, but I don't know exactly **what or to whom**.
 b. ...but I don't know exactly



However, there are sufficient differences between multiple sluicing and coordinated sluicing to argue against deriving coordinated sluicing from multiple sluicing (see Koval (2019) for a discussion of differences between multiple sluicing and coordinated sluicing in Russian).

3.1 AGAINST MULTIPLE SLUICING AS THE SOURCE OF COORDINATED SLUICING

Multiple sluicing is (cross-linguistically) subject to a clause-mate condition, which requires all wh-remnants in a multiple sluicing configuration to originate in the same (finite) clause (see Takahashi 1994, Nishigauchi 1998, Merchant 2001, Marušič and Žaucer 2013, Lasnik 2014, Citko to appear), as shown in (24a) and (25a). Coordinated sluicing, however, is not subject to this constraint (Abels and Dayal 2017a), as (b) examples show.

- (24) a. *[One of the students said [that Mary spoke to one of the professors]], but I don't know **which student to which professor**. (Lasnik 2014: 6)
 b. [One of the students said [that Mary spoke to one of the professors]], but I don't know **which student or to which professor**.
- (25) a. *[Some linguist was upset [because Harry spoke to some philosopher]] but Bill doesn't know **which linguist to which philosopher**.
 b. [Some linguist was upset [because Harry spoke to some philosopher]] but Bill doesn't know **which linguist and which philosopher**. (Abels and Dayal 2017a: 25)

¹ If (23) were the correct structure for coordinated sluicing in English, the question is what excludes such a structure for CWHs in English. We hypothesize that this is because CWHs do not involve ellipsis, so the derivation of a mono-clausal CWH would involve the illicit pronunciation of two highest wh-copies.

Multiple sluicing is marginal if both wh-remnants are simplex wh-DPs (*who, what*), and improves considerably (at least for some speakers) if one wh-phrase is either a PP (Lasnik 2014; Abels and Dayal 2017a, 2017b; Kotek and Barros 2018, Cortés Rodríguez 2019), as shown in (26), or a *which-NP* phrase, as shown in (27).

- (26) a. *John gave someone something, and I want to know **who what**.
b. ?John gave something to someone, but I don't know **what to whom**.

(Hoyt and Teodorescu 2012: 86 crediting Richards 1997)

- (27) a. ?*Someone saw something, but I can't remember **who what**. (Park and Kang 2007: 396)
b. Every boy likes some girl, but I don't know **which boy which girl**. (Kotek and Barros 2018: 799)

Coordination of simplex wh-DPs, by contrast, is perfectly fine with coordinated sluicing, as (28) shows.

- (28) John gave someone something, and I want to know **who and what**. (Hoyt and Teodorescu 2012: 86)

The interpretation of coordinated sluicing is also different from the interpretation of multiple sluicing: Abels and Dayal (2017a: 24) note that **multiple sluicing can in principle have either a single-pair (SP) or a pair-list (PL) reading**, and that the readings are disambiguated by the antecedent.²

- (29) a. Some student has published on some topic, but I couldn't tell you **which student on which topic**. *SP*
b. Every student has published on some topic, but I couldn't tell you **which student on which topic**. *PL*
(Abels and Dayal 2017a: 24)

Coordinated sluices, however, only allow SP readings (as noted by Gribanova (2009), who builds on Grebenyova's (2007) work on multiple sluicing in Russian, and by Abels and Dayal (2017a)). This is indicated by the infelicity of (30b), whose antecedent forces the PL interpretation.

- (30) a. Some student has published on some topic, but I forgot **which student and on which topic**. *SP*
b. #Every student has published on some topic, but I forgot **which student and on which topic**. *PL*

Thus, the differences between multiple sluicing and coordinated sluicing lead us to conclude that ***coordinated sluicing is not derived from multiple sluicing***.

4. ANALYSIS

The differences between coordinated sluicing on the one hand, and coordinated wh-questions and multiple sluicing on the other suggest that neither of these constructions is the source of coordinated sluicing.

² Merchant (2001) states that multiple sluicing has only the pair-list reading, as indicated by the ungrammaticality of (i), where the antecedent forces a single-pair reading, in contrast to (ii), where it forces a pair-list reading.

- i. *Someone said something, but I couldn't tell you who what.
ii. (?)Everyone brought something (different) to the potluck, but I couldn't tell you who what.

(Merchant 2001: 112)

The analysis of coordinated sluicing must account for the following properties of this construction:

- Coordinated sluicing is not subject to the clause-mate condition (unlike multiple sluicing),
- There are no restrictions on the category of *wh*-phrases in coordinated sluicing (unlike in multiple sluicing),
- There is no ban against coordination of arguments in coordinated sluicing (unlike in CWHs),
- Coordinated sluicing does not have the *at all* reading (unlike CWHs).

We note that in examples involving coordinated sluicing, as in (31a), the interpretation of the second sluice is the one in (31b).

- (31) a. I know Abby called some suspect. I wish I knew **which suspect and when**.
 b. I know Abby called some suspect. I wish I knew **which suspect** Abby called and **when** she called *him*.

This is similar to the interpretation of sluicing examples like (32) below, discussed first by Merchant (1999).

- (32) a. **Which suspect** did Abby call **and when**?
 b. **Which suspect** did Abby call and **when** did she call *him*? (Merchant 1999: 484)

Merchant proposes that in examples like (32), the elided TP contains a pronominal correlate of the *wh*-trace in the antecedent clause, as in (33). This pronominal correlate is interpreted as a pronoun (an E-type pronoun).

- (33) [_{CP} **Which suspect**₂ did [_{TP} Abby call *t*₂]] and [_{CP} **when** [_{TP} Abby call *P*_{e2}]] (Merchant 1999: 484)

OUR PROPOSAL: Coordinated sluicing is derived from coordination of singular *wh*-questions, with an E-type pronoun in the second conjunct, co-indexed with the trace of the *wh*-phrase in the first conjunct (see also Scott 2012 and Barros and Kotek 2019).³

- (34) a. Someone saw something, but I can't remember **who or what**.
 b. Someone saw something, but I can't remember [**who**_i <~~*t*_i saw something~~>] or [**what**_j <~~*they*_i saw *t*_j~~>]

The bi-clausal structure we propose for coordinated sluices is different from the structures that have been proposed for multiple (non-coordinated) *wh*-sluices, coordinated *wh*-questions, and clefts, given in (35a-c).

- (35) a. Someone saw something, but I can't remember **who_i or what_j** <~~*t*_i saw *t*_j~~>? *Multiple Sluicing*
 b. Someone saw something, but I can't remember **who_i** <~~*t*_i saw~~> or **what_j** <~~saw *t*_j~~>? *CWHs*
 c. Someone saw something, but I can't remember **who** <~~*it was*~~> or **what** <~~*it was*~~>. *Coordinated Clefts*

³ This is the structure that Scott (2012: 119) proposes for coordinated sluicing involving two adjunct *wh*-phrases and the structure that Barros and Kotek (2019) assume when they discuss the identity condition on sluicing in examples like (i).

(i) a. Sally met someone, but I don't know who or when.
 b. Sally met someone, but I don't know who ~~she met~~ or when ~~she met them~~. (Barros and Kotek 2019: 24)

Thus, we predict no similarities *whatsoever* between coordinated sluices on the one hand, and multiple sluicing, coordinated wh-questions and coordinated clefts on the other hand (for a discussion of coordinated clefts, see Appendix A).

The bi-clausal structure we posit straightforwardly derives two properties of multiple coordinated sluicing:

The absence of the clause-mate condition: The clause-mate condition seems to arise only when the two instances of wh-movement interact (so that their paths either nest or cross). Abels and Dayal (2017a, 2017b), for example, account for the clause-mate condition by assuming that covert wh-movement is clause-bound and subject to superiority. Recall that for them the second wh-phrase in a multiple sluicing configuration undergoes *covert* wh-movement.

On our analysis, the two instances of wh-movement in coordinate sluicing, schematized in (36b), happen in separate clauses, unlike in multiple sluicing, schematized in (36a).

- (36) a. [CP **who_i** [C' **what_j** [[[TP ...**t_i** ...**t_j** ...]]]] *multiple sluicing*
 b. [&P[CP **who_i** [TP ... **t_i** ...] and [CP **what_j** [[TP ...**t_j** ...]]]] *coordinated sluicing*

Since in (36b) there is no interaction between the two instances of wh-movement (neither is *non-first*), the absence of the clause-mate condition in coordinated sluicing, illustrated by the contrasts in (37) and (38), is expected.

- (37) a. A certain boy said that Fred talked to a certain girl. *I wish I could remember **which boy to what girl**.
(Lasnik 2014: 12)
 b. ...I wish I could remember **which boy and to what girl**.

- (38) a. *Some linguist was upset because Harry spoke to some philosopher but Bill doesn't know **which linguist to which philosopher**.
 b. Some linguist was upset because Harry spoke to some philosopher but Bill doesn't know **which linguist and to which philosopher**.
(Abels and Dayal 2017a:25)

The absence of the restriction on the category of wh-phrases that can be coordinated: Recall that English multiple sluicing is degraded if both wh-remnants are simplex wh-DPs and improves if the second wh-phrase is a PP (Bolinger 1978; Richards 1997, 2010; Lasnik 2014; Cortés Rodríguez 2019).

- (39) a. [?]/*Someone saw something, but I can't remember **who what**.
 b. [?]Someone talked about something, but I can't remember **who about what**. (Lasnik 2014: 8)

Lasnik attributes the ungrammaticality of (39a) to restrictions on extraposition. On his analysis, the second remnant in a multiple sluicing construction undergoes extraposition, as shown in (40).

- (40) Someone talked about something but I can't remember [CP **who_i** [TP ~~**t_i** talked **t_j**~~] [**about what_j**]]

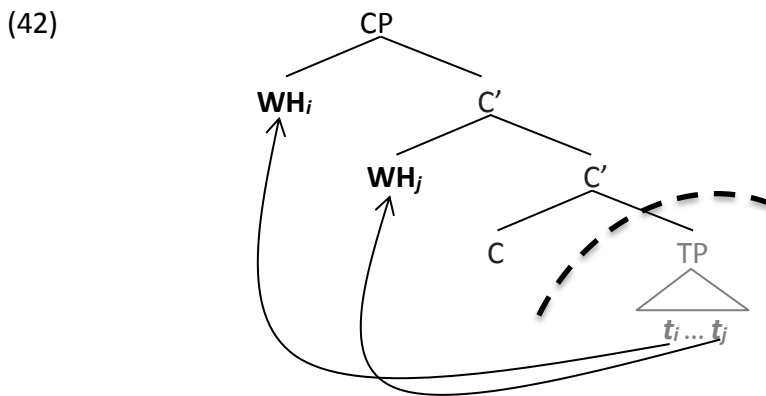
Extraposition is also sensitive to the DP vs. PP contrast, as shown in (41).

- (41) a. ?***Who** bought yesterday **what**?
 b. **Who** was talking yesterday **to who**?

(Lasnik 2014: 9)

On our analysis, coordinated sluicing is not derivationally related to multiple sluicing, so the second wh-phrase at no point undergoes extraposition. Thus, the absence of the preference for PPs is expected.

Richards (2010) accounts for the clause-mate condition in multiple sluicing in a different way. He assumes that multiple sluicing involves the structure in (42).



For Richards (2010) the ban on two wh-DP remnants in English sluicing is a special case of a more general restriction on linearization that “rejects trees in which two nodes that are both of type α are to be linearized in the same Spell-Out domain” (pg. 5). Richards refers to this restriction as *Distinctness*.

(43) *Distinctness*

If a linearization statement $\langle \alpha, \alpha \rangle$ is generated, the derivation crashes.

(Richards 2010: 5)

In a multiple sluice, two wh-DP remnants cause the derivation to crash because the linearization statement $\langle DP, DP \rangle$ is created once both are fronted to left-peripheral positions.

Since on our analysis of coordinated sluicing, the two wh-phrases are in separate clauses, they are never required to be linearized in the same Spell-Out domain, so even when both are DPs, the illicit linearization statement is never created and the derivation does not crash.

Thus, the bi-clausal analysis that we propose captures the fact that in English coordinated sluicing has a wider distribution than multiple sluicing.

The bi-clausal nature of our analysis does not in and of itself derive the availability of wh-argument coordination in coordinated sluicing, or the non-availability of the *at-all* reading. However, both of these properties follow from the presence of an E-type pronoun in the second conjunct, co-indexed with the trace of the wh-phrase in the first conjunct:

- (44) Someone saw something, but I can't remember **who**, ~~<t_i saw something>~~ **or what**, ~~<they_j saw t_j>~~.

The presence of the pronoun in the second conjunct ensures that the selectional properties of the verb are satisfied in both conjuncts of the coordinated sluice:

- In the first conjunct, the selectional requirements of the verb are satisfied by the wh-phrase and the indefinite;
- In the second conjunct, the selectional requirements of the verb are satisfied by the wh-phrase and the E-type pronoun co-indexed with the trace of the wh-phrase in the first conjunct.

Since the selectional properties of the verb are satisfied in both conjuncts, regardless of the type of wh-phrases or the type of the verb, coordination of wh-arguments (including wh-subjects) is possible.

This also readily derives the absence of the *at-all* reading in coordinated sluicing. The *at-all* reading arises in coordination of interrogative clauses in which each wh-phrase is only interpreted in its own conjunct, as in the CWH in (45a). Since in coordinated sluicing *both* wh-phrases are interpreted in the second conjunct, the *at-all* reading is not available, as (46) shows.

- (45) a. **What and where** did John eat?
 b. **What** did John eat and **where** did John eat *at all*? *At-all reading*
- (46) a. I know John ate something at a famous restaurant but I forgot **what and where**.
 b. ...I forgot **what** John ate and **where** he ate *it/the thing he ate /#at all*. *It reading*

Finally, since on our analysis coordinated sluicing involves a coordination of two single questions, it captures the observation that coordinated sluices have only single pair readings and contrast in this respect with multiple (non-coordinated) sluices. This is shown in (47), repeated from (29).

- (47) a. Some student has published on some topic, but I forgot **which student and on which topic**.
 b. #Every student has published on some topic, but I forgot **which student and on which topic**.

Thus, the analysis we propose for coordinated sluicing derives all its properties. The fact that coordinated sluicing is derived differently from CWHs and multiple sluicing explains why its properties are different from the properties of these constructions.

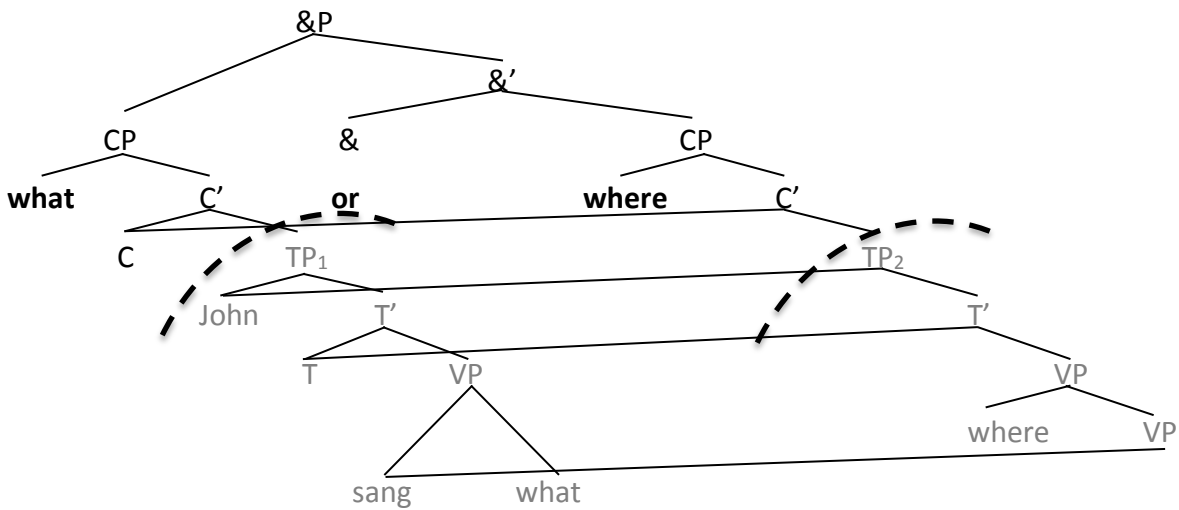
5. BACK TO COORDINATED SLUICING *VERSUS* COORDINATED WH-QUESTIONS

So far, we have shown that coordinated sluicing cannot be derived from CWHs, but we didn't say why.

- **Why cannot coordinated sluicing be derived from the same underlying source as CWHs**, given that the two involve the exact same surface string (*wh₁ and wh₂*).

If this were possible, the coordinated sluice in (48a) would be derived from the structure of CWH in (48b), and would presumably have the properties found in CWHs, contrary to fact.

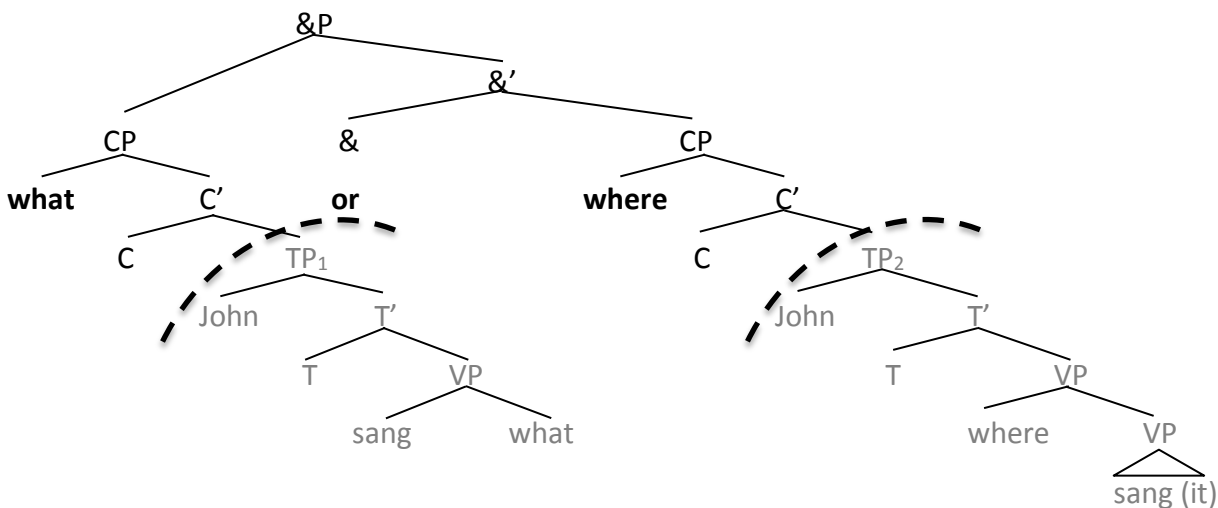
- (48) a. I know John sang, but I don't remember **what or where**.
 b. ...but I don't remember



We hypothesize that (48b) is excluded by economy. In (48b), the elided material (*John sang*), is simultaneously dominated by the TPs in both conjuncts. Therefore, deleting that *single* string of shared material requires deleting *two* syntactic objects: TP₁ and TP₂.

In our analysis of coordinated sluicing, given in (49b), ellipsis applies to the same *two* syntactic objects: TP₁ and TP₂. However, each TP dominates its own *separate* string. Although the two strings are phonologically identical, there is a sense in which no instance of ellipsis in (49b) applies “in vain”. This is arguably more economical than the operation in (48), where both instances of ellipsis remove *the same string* from the representation.

- (49) a. I know John sang, but I don't remember **what or where**.
 b. ...but I don't remember



- The opposite question is **why CWHs cannot be derived from coordinated sluicing**.

If this were the case, the CWH in (50a) would have the structure in (50b) and would allow, e.g., coordination of arguments, contrary to fact.

- (50) a. *Tell me **who and what** sang?
 b. Tell me **who_i < ~~t_i sang >~~** and **what_j < they_i sang t_j >**?

In (50b), sluicing operates backwards (as was proposed for CWHs by Browne 1972, for example), so on such an analysis, the E-type pronoun in the second conjunct (*they* in (50b)) would survive ellipsis, but the element with which it is co-indexed (the trace of *who* in the first conjunct) would be elided. We hypothesize that this is disallowed: the antecedent of a non-elided E-type pronoun cannot be elided.

We base this hypothesis on the contrast in (51), where the (a) example contains no ellipsis in the first conjunct, and the pronunciation of the E-type pronoun in the second conjunct is licit, while the (b) example, in which the first conjunct is elided, no longer licenses the pronunciation of the pronoun in the second conjunct.

- (51) a. The report details **what** IBM did and **why** IBM did *it*. (Merchant 2001: 203)
 b. *The report details **what** and **why** IBM did *it*.

In order to derive CWHs from (50b), the non-elided E-type pronoun in the second conjunct would always be co-indexed with a trace that has undergone ellipsis. If this is illicit, we have an explanation for why CWHs cannot be derived in the same way as coordinated sluices.

6. CONCLUSION

We started with a puzzle concerning the ameliorating effect of coordination in multiple sluicing: **Why do the ungrammatical cases of multiple sluicing in English improve when the wh-phrases are coordinated?**

We showed that coordinated sluicing cannot be derived from coordinated wh-questions (CWHs):

- Coordinated sluices differ from CWHs in that they allow wh-coordination to contain obligatory argument(s) of the verb.
- Coordinated sluices differ from coordinated CWHs in that they disallow so-called *at all* readings.

We showed that coordinated sluicing cannot be derived from multiple sluicing:

- Coordinated sluicing differs from multiple sluicing in that it is *not* subject to the clause-mate condition.
- Coordinated sluicing differs from multiple sluicing in that it allows coordination of simplex DP wh-phrases.

We proposed a bi-clausal structure for coordinated sluices, which involves coordination of two CPs, with a single wh-phrase in the specifier of each CP and TP ellipsis in each CP.

We explained why coordinated sluicing and CWHs cannot have the same underlying source.

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APPENDIX A: COORDINATED CLEFTS A POSSIBLE SOURCE FOR COORDINATED SLUICES

On some accounts, sluicing can be derived from non-isomorphic pre-sluice sources (i.e., short sources, predicative sources, cleft sources) (Erteschik-Shir 1973; Marušič and Žaucer 2013; Barros, Elliott and Thoms 2015, among others). This is one way to derive the lack of island effects in sluicing or exceptions to the P-stranding generalization.

- (1) They hired someone who speaks a Balkan language – guess which! (Merchant 2001: 209)
- a. which they hired someone who speaks!
 - b. which he speaks!
 - c. which it was!

Abels and Dayal (2017a: 25) suggest that coordinated sluices, like the one in (2a), “are derived from a different pre-sluice”, indicated by their cleft source and/or predicative source paraphrases in (2b):

- (2) a. Some linguist spoke to some philosopher but Bill doesn’t know **which linguist and which philosopher**.
- b. Some linguist spoke to some philosopher but Bill doesn’t know **which linguist and which philosopher it was/they were**. (adapted from Abels and Dayal 2017a: Fn 16)

Here, we focus on the cleft sources and the question of whether coordinated sluices in general can be derived from coordinated clefts:

- (3) a. I know that someone saw something but I don’t know **who or what**.
- b. I know that someone saw something but I don’t know **who** it was **or what** it was.

The same considerations that rule out a cleft source for singular sluices rule out a cleft source for coordinated sluices. We show this by applying to coordinated sluices Merchant’s diagnostics that distinguish clefts with wh-pivots from singular sluices.

➤ Compatibility with adjuncts

Adjuncts can appear in coordinated wh-sluices, but not in clefts:

- (4) a. He fixed the car but I don’t know **how/why/when** (* it was). (Merchant 2001: 121)
- b. He fixed something somehow, but I don’t know **what or how**.
- c. He fixed something somehow but I don’t know **what** it was **or how** (*it was).

➤ Compatibility with implicit arguments

Implicit arguments are possible as correlates of wh-phrases in sluicing constructions but not as pivots of clefts:

- (5) a. They served the guests but I don't know **what** (*it was). (Merchant 2001: 121)
 b. They served someone but I don't know **whom or what**.
 c. They served someone but I don't know **who** it was **or what** (*it was).

➤ D-linking

Aggressively non-D-linked wh-phrases are disallowed in coordinated wh-slucing, but not in clefts:

- (6) Someone dented my car last night--
 a. I wish I knew **who**!
 b. I wish I knew **who the hell** it was!
 c. *I wish I knew **who the hell**! (Merchant 2001: 122)

- (7) a. Someone saw something, but I can't remember **who (the hell)** it was **or what (the hell)** it was.
 b. *Someone saw something, but I can't remember **who the hell or what the hell**.

➤ 'Mention-some' modification

Wh-pivots in pseudoclefts are impossible with modifiers like '*for example*'

- (8) **A:** You should talk to somebody in the legal department for help with that.
B1: Could you tell me **who** (*it is), *for example*?
B2: **Who** (*is it), *for example*? (Merchant 2001: 122)

- (9) **A:** You should talk to someone in the legal department about something.
B1: Could you tell me **who or what about**, *for example*?
B2: Could you tell me **who**, *for example*, **or what about**?

➤ Swiping (Sluiced **Wh**-phrase Inversion with **Prepositions** in **Northern Germanic**)

Coordinated wh-slucices allow swiping but clefts with wh-pivots do not:

- (10) a. John spoke to someone about something but I don't know **who to** or **what about**.
 b. *John spoke to someone about something but I don't know **who to** it was or **what about** it was.

➤ Case

In languages in which wh-pivots in clefts are nominative, we expect to find wh-phrases in coordinated sluicing to be nominative as well if coordinated sluices are derived from coordinated clefts. We illustrate with data from Polish that this is not what we find (see Sag and Nykiel 2011 for discussion of case in Polish non-coordinated sluices):

- (11) a. Ktoś kierował czymś, ale nie wiem, **kto** to był i **co** to było.
 someone.NOM managed something.INSTR but not know who.NOM it was and what.NOM it was
 ‘Someone managed something but I don’t know who and what it was.’
- b. Ktoś kierował czymś, ale nie wiem, **kto** i **czym** /***co**.
 someone managed something.INSTR but not know who.NOM and what.INSTR /*what.NOM
 ‘Someone managed something but not know who and what.’

Similar case considerations rule out predicative sources for coordinated sluices:

- (12) a. Adam regularnie dostaje prezenty od **kogoś** ale nie wiem, **kogo** /***kim**.
 Adam regularly gets presents from someone.GEN but not I.know who.GEN/*who.INSTR
 ‘Adam regularly gets presents from someone/some girl, but I don’t know who/which (girl).’
- b. Adam regularnie dostaje prezenty od **kogoś**, ale nie wiem, **kim** /***kogo**
 Adam regularly gets presents from someone.GEN but not I.know who.INSTR/*who.GEN
 jest osoba od której Adam dostaje prezenty.
 is person.NOM from whom.GEN Adam gets presents
 ‘Adam regularly gets presents from someone, but I don’t know who is the person Adam regularly
 gets presents from.’ (adapted from Sag and Nykiel 2011: 200)
- c. Ktoś regularnie dostaje prezenty od kogoś, ale nie wiem
 someone.NOM regularly gets presents from someone.GEN but not I.know
kto i **od kogo** /***kim**.
 who.NOM and from who.GEN/*INSTR
 ‘Someone regularly gets presents from someone, but I don’t know who and from whom.’

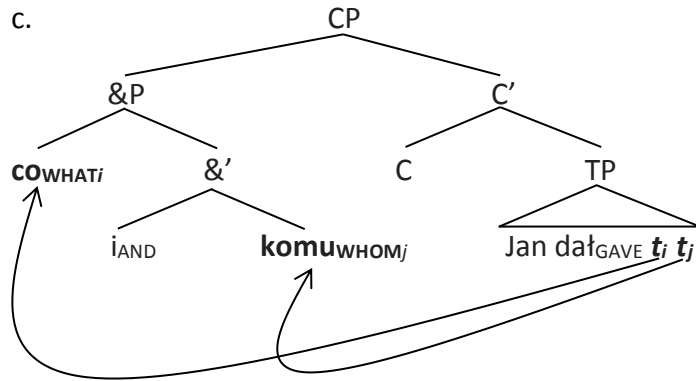
APPENDIX B: COORDINATED SLUICING CROSSLINGUISTICALLY (Citko and Gračanin-Yukseš *to appear*)

We have established above that coordinated sluicing in English cannot be derived from English CWHs. Although we argued that both constructions involve a bi-clausal source, we concluded that their structures must be different because of the different properties that coordinated sluicing and CWHs display.

Next we focus on the question of whether the bi-clausal structure we posited as the only structure for coordinated sluicing in English is also the structure of coordinated sluicing in languages with multiple wh-fronting.

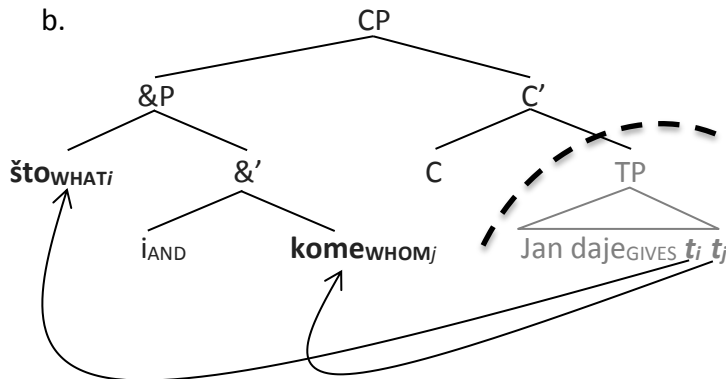
Recall that multiple wh-fronting languages have an alternative structure for CWHs, given in (1c), which derives, e.g., the availability of wh-argument coordination, shown in (1a-b).

- (1) a. **Co i komu** Jan dał? *Polish*
 what and whom Jan gave
Lit. ‘What and to whom Jan gave?’
- b. **Što i kome** Jan daje? *Croatian*
 what and whom Jan gives
Lit. ‘What and to whom is Jan giving?’



Given the availability of (1c), the coordinated sluice in (2a) may be derived from the same structure, with the deletion of the TP, as in (2b).

- (2) a. Jan nekome nešto daje. Pitam se **što i kome.** *Croatian*
 Jan to-someone something gives wonder-I REFL what and to-whom
 ‘Jan is giving something to someone. I wonder what and to whom.’



This analysis cannot be excluded – properties of mono-clausal CWHs mirror those of coordinated sluicing.

Both CWHs and coordinated sluicing allow coordination of wh-arguments:

- (3) a. **Što i kome** Jan daje? Croatian
 what and whom Jan gives
Lit. ‘What and to whom is Jan giving?’
 b. Jan nekome nešto daje. Pitam se **što i kome**.
 Jan to-someone something gives wonder-I REFL what and to-whom
 ‘Jan is giving something to someone. I wonder what and to whom.’

Both CWHs and coordinated sluicing are possible with obligatorily transitive verbs (if one of the coordinated wh-phrases is an object and the other an adjunct):

- (4) a. **Što i zašto** Jan odbija? Croatian
 what and why Jan refuses
Lit. ‘What and why is Jan refusing?’
 b. Jan iz nekog razloga nešto odbija. Pitam se **što i zašto**.
 Jan from some reason something refuses wonder-I REFL what and why
 ‘Jan is for some reason refusing something. I wonder what and why.’

Both CWHs and coordinated sluicing allow *it* readings; examples (4a) and (4b) are interpreted as (5a) and (5b) respectively.

- (5) a. What is Jan refusing and why is Jan refusing *it/the thing he is refusing*? *It reading*
 b. I wonder what Jan is refusing and why he is refusing *it/the thing he is refusing*. *It reading*

Even CWHs with optionally transitive verbs in which one of the wh-phrases is an object, as in (6a), have the *it reading* as one of the possible interpretations:⁴

- (6) a. **Što i zašto** Jan pjeva? Croatian
 what and why Jan sings
Lit. ‘What and why is Jan singing?’
 b. What is Jan singing and why is Jan singing *it/the thing he is singing*? *It reading*
 c. What is Jan singing and why is Jan singing *at all*? *At-all reading*

However, the bi-clausal structure we posited for coordinated sluicing in English must also be available in multiply wh-fronting languages. The evidence comes from the distribution of the particle *to* in Croatian wh-constructions (Browne 1976; Rudin 1988; Progovac 1998 on *to* more generally). In Croatian, this particle can appear in wh-questions (7a), multiple wh-questions (7b) and coordinated wh-questions (7c).

⁴ Such CWHs also have the *at-all* interpretation because they can also be derived from the bi-clausal non-bulk sharing analysis, which is the only analysis for English CWHs.

- (7) a. **Koga (to)** Jan zove?
 who.ACC *to* Jan calls
 ‘Who is Jan calling?’
- b. **Što (to) kome** Jan daje?
 what.ACC *to* to-who Jan gives
Lit: ‘What to whom is Jan giving?’
- c. **Što (to) i kome** Jan daje?
 who.ACC *to* and to-who Jan gives
Lit: ‘What and to whom is Jan giving?’⁵

In multiple wh-questions, *to* can only appear once. The presence of an extra *to* in a multiple wh-question (8a) and in a necessarily mono-clausal CWH (8b) leads to ungrammaticality. This suggests that there can be only one *to* per clause.

- (8) a. **Što (to) kome (*to)** Jan daje? *Croatian*
 what.ACC *to* to-who *to* Jan gives
Lit: ‘What to whom is Jan giving?’
- b. **Što (to) i kome (*to)** Jan daje?
 who.ACC *to* and to-who *to* Jan gives
Lit: ‘What and to whom is Jan giving?’

Note that (8b) cannot be bi-clausal because it involves coordination of two obligatory arguments of the ditransitive verb *dati* ‘give’. When a bi-clausal structure is available, as in (9), which contains an optionally transitive verb (and a wh-object), the second *to* becomes possible:

- (9) **Što (to) i kome (to)** Jan predaje?
 what *to* and to-whom *to* Jan lectures
 ‘What and to whom does Jan lecture?’

In sluicing, *to* can appear in a single sluice (10a), but it is banned from multiple sluices (10b).⁶

- (10) a. Netko zove Jana ali ne znam **tko to**. *Croatian*
 someone calls Jan.ACC but NEG know.1SG who TO
 ‘Someone is calling Jan, but I don’t know who.’
- b. Netko je nekoga pozvao. Pitam se **tko (*to) koga (*to)**.
 someone has someone invited wonder-I REFL who.NOM TO who.ACC TO
 ‘Someone has invited someone. I wonder who whom.’

⁵ Rudin (1988: 472) uses the distribution of *to* (the demonstrative particle) to argue for the claim that (Serbo-)Croatian is [– MULTIPLY FILLED SPEC CP] language:

- *to* appears only in main clauses;
- in a multiple wh-question, *to* follows the first wh-word and precedes the second one.

Halpern (1995: 89) adopts Rudin’s analysis, but calls the particle “cleft-marking *to*”.

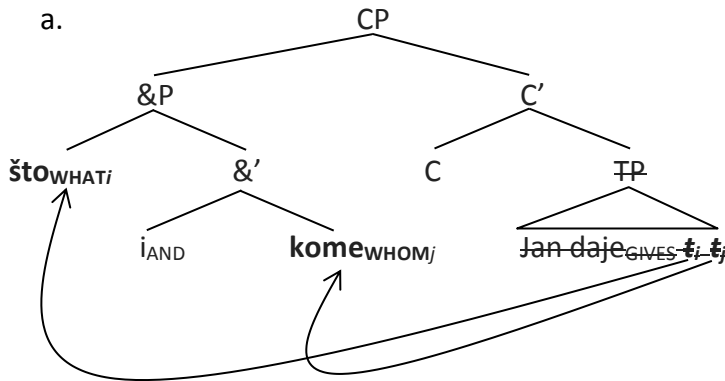
⁶ The appearance of *to* in sluicing violates Merchant’s (2001) generalization that non-operator material cannot appear in COMP under sluicing (but see Marušič *et al* 2015).

The ban on even a single *to* in the (presumably mono-clausal) multiple sluice in (10a) is mysterious. But crucially, in coordinated sluicing, *to* can appear following the first, the second, or *both* wh-phrases (11).

- (11) Netko je nekoga pozvao. Pitam se **tko** (to) i **koga** (to). Croatian
 someone has someone invited wonder-I REFL who.NOM TO and who.ACC TO
 'Someone is calling someone. I wonder who whom.'

This suggests a bi-clausal structure for coordinated sluices. Thus, in Croatian (and possibly in other multiple wh-fronting languages) coordinated sluicing may be derived from a mono-clausal source in (12a), and a bi-clausal source in (12b).

- (12) a. Croatian



- b. Jan nekome nešto daje. Croatian
 Jan to-someone something gives
 Pitam se **što**_i <Jan nekome — daje ~~t_i> i **kome**_j <Jan to daje ~~t_j>.
 wonder-I REFL what Jan to-someone gives and to-whom Jan it gives
 'Jan is giving something to someone. I wonder what and to whom.'~~~~