



HÁSKÓLI ÍSLANDS

Hugvísindasvið

The Bisecting CP Hypothesis

Unifying the Raising and Matching Analysis of Relative Clauses

M.A. Thesis

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Abstract

Within the field of linguistics, the makeup of the Complementizer Phrase (CP) layer of the clause has been an issue of recurring debate. Being dependent upon the CP, the structure of relative clauses has been particularly contentious. Two different analyses – raising and matching – have received attention as plausible approaches, but both have also faced considerable criticism.

This thesis concurs with criticism from Newmeyer (2004) and Sobin (2003) that CP layer is not split in the way that Rizzi (1997) hypothesizes, and determines that van Craenenbroeck's (2007) alternative split CP model also faces obstacles. However, I argue that the CP layer can still accommodate more projections than assumed in a traditional CP analysis, particularly with relative clause constructions. I propose a Bisecting CP Hypothesis which allows for reconstruction of the internal relative clause head in an analogous way as the matching and raising analyses, but which eliminates the stipulation of matching and addresses the issue of case and theta assignments, an area largely ignored by raising.

The Bisecting CP Hypothesis effectively unifies the raising and matching analyses of relative clauses. Implications of this thesis extend to the analysis of *wh*-pronouns and *wh*-interrogatives, to the D-linking of *wh*-phrases, and to free relative derivation.

Should the CP system be considered an analogous extension of the IP system, hence ultimately of the VP? I believe there is a substantial difference between the two cases. Whatever "inflectional" properties C reflects, they are not encoded in the form of verbal morphology, in the general case: they are expressed on free functional morphemes (that, que, etc.) which, if anything, look nominal more than verb-like, as they often resemble demonstrative pronouns, wh elements, certain kinds of nouns ("fact", etc.), etc. So, I will continue to assume that the C system is fundamentally distinct from the I system...

– Rizzi (1997)

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1 Introduction

From the point of Rosenbaum's (1967) monograph that introduced the concept of complementizers to linguistics, the makeup of the Complementizer Phrase (CP) layer has been an issue of recurring debate. In this thesis, I will argue that the CP layer is not split in the way that Rizzi (1997) hypothesizes, but nonetheless can accommodate more projections than assumed in a traditional CP analysis. I argue for a Bisecting CP analysis that imitates closely the matching analysis of relative clauses, yet accounts for the matching of relative clause internal and external arguments in a more systematic way. This analysis combines aspects of van Craenenbroeck's (2007) split CP analysis and Bianchi's (1999) determiner incorporation analysis and extends them across the full range of *wh*-subordinate clauses, including indirect questions, headed relative clauses and free relative clauses. This innovative analysis, which finds inspiration in a common process in biology, can account for many of the syntactic facts associated with the CP system, specifically in regards to *wh*-movement, Doubly Filled Comp restrictions, and the formation of restrictive relative and free relative clauses.

This thesis is organized as follows. In section two, the Split CP Hypothesis as proposed by Rizzi (1997) is introduced and briefly summarized. The summary is then followed by criticism of the hypothesis, first by Newmeyer (2004) and then by Sobin (2003). This section ends with the suggestion that topicalization should be treated as adjunction and *wh*-movement is the only focus item that should remain within the CP. Section three then discusses van Craenenbroeck's (2007) alternative analysis of a split CP in relation to *wh*-movement, attempting to discern a syntactic difference between simple and complex *wh*-phrases. This is followed by some observed issues with his analysis. The discussion moves in section four to a general discussion about interrogative clauses and their relation to interrogative clauses. Following from the relationship between embedded interrogative constructions and relative clause constructions, the section then discusses relative clauses and compares their three contemporary analyses – head external, raising, and matching. Section five proposes a change to the CP system, called the Bisecting CP Hypothesis, as a solution to restrictive relative clause constructions. Section six then examines free relative clauses and discusses many issues concerning

free relatives and offers an analysis as to how they fit into the Bisecting CP Hypothesis. Conclusions are offered in the final section.

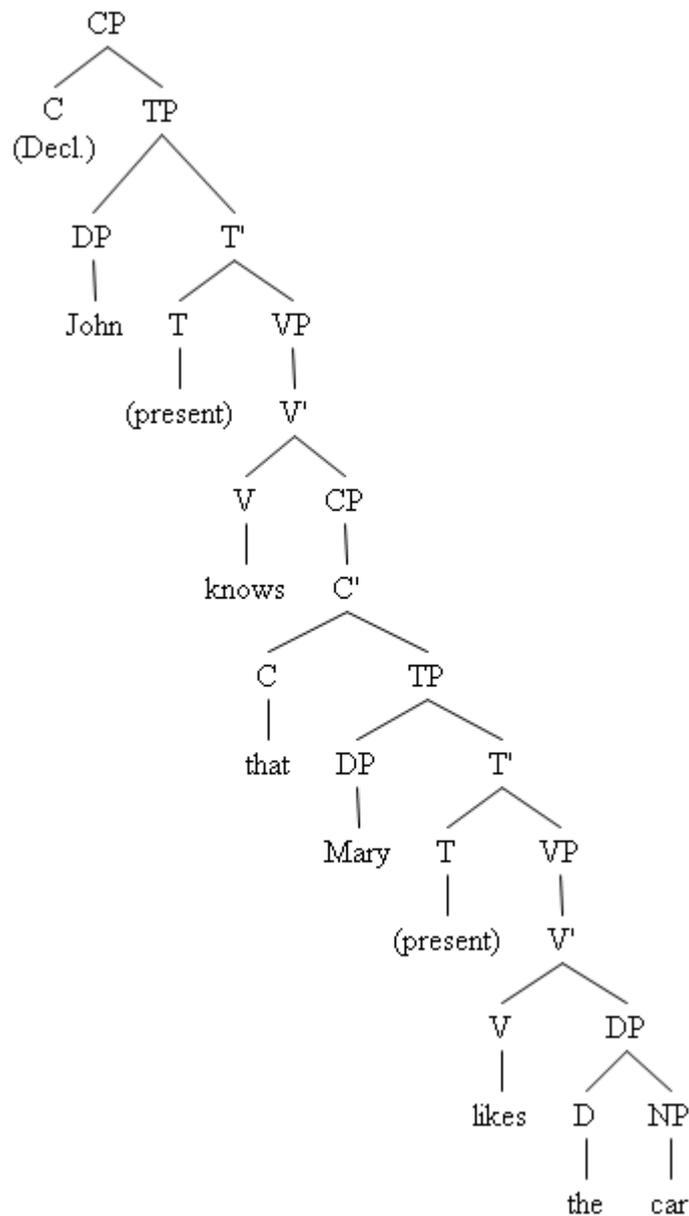
2 The CP layer and Split CP Hypothesis

The contemporary view in generative linguistics is that a clause consists of three layers: CP, TP (or IP) and VP. Researchers have since presented evidence that each layer can be split into several projections, expanding each layer. The three layers of a clause in a sentence such as:

(1) John knows that Mary likes the car

can be represented rather simplistically as:

(2)



The Complementizer Phrase layer in a clause, or CP, serves as the interface between two clauses: the superordinate *John knows* and the subordinate *Mary likes the car*. It is generally accepted that at the top of the CP, the force of the clause (whether it is declarative or interrogative) must be specified, while at the lower end there must be some specification as to the finiteness of the clause it embeds. In example (2), the complementizer *that* is declarative in force and can take only a finite clause as its complement. Force and finiteness appear to be two different functions and therefore could be expressed by two different heads in the CP which gives plausibility to the idea that the CP may be split. Another factor that helps this initial plausibility is the fact that while the CP is commonly the host for complementizers and *wh*-movement, it has been speculated that the CP can also host left-dislocated things such as Topic and Focus. In the Split CP Hypothesis, as proposed by Rizzi (1997), the topicalized or focused constituent “splits” the Force and Finiteness of one head into two separate and distinct heads with the topicalized or focused constituent occupying either the Topic or Focus projection between. So when *that* is in Force in a split CP, it can only mark the force of the clause as declarative and therefore a null *that* is needed to fill Finiteness to then mark the clause as finite. According to Rizzi, Force and Finiteness projections would then collapse into one head again if there are no topicalized or focused constituents in the CP. However, while fronted Topic and Focus items can appear to be in the same position in English, Rizzi bases his hypothesis on examples in Italian, where topicalizing and focusing of items are treated rather differently.

- (3) Il tu libro, lo ho letto
 The your book, I have read
 ‘Your book, I have read it’
- (4) IL TU LIBRO ho letto, (non il suo)
 THE YOUR BOOK I read, (not the his)
 ‘YOUR BOOK I read, (not his)’

Example (3) is one of topicalization in Italian while (4) is one of focalization. These examples give two different discourse interpretations:

Topic – Comment	Topic (what the sentence is about)
	Comment (what the sentence says about the topic)

Focus – Presupposition

Focus (what is new in the sentence)

Presupposition (what is old/ presupposed in the sentence)

Since Force is assumed to be high in the CP and Finiteness to be lower, Focus and Topic, according to Rizzi, must be between these two positions. Rizzi also presents evidence in Italian that *di* introduces non-finite embedded clauses and follow topics, while *che* introduces finite embedded clauses and precede topics. Hagstrom (2001) gives the following examples:

- (5) Credo che loro apprezzerebbero molto il tuo libro.
I believe that they would appreciate much the your book
'I believe that they would appreciate your book very much.'
- (6) Credo di apprezzare molto il tuo libro.
I believe of to appreciate much the your book
'I believe to appreciate your book very much.'
- (7) a. Credo che il tuo libro, loro lo apprezzerebbero molto.
I believe that the your book they it would appreciate much
'I believe that your book, they would appreciate it a lot
b. *Credo, il tuo libro, che loro lo apprezzerebbero molto
I believe the your book that they it would appreciate much
I believe, your book, that they would appreciate it a lot.'
- (8) a. *Credo di il tuo libro, apprezzar-lo molto.
I believe of the your book to appreciate-it much
'I believe of your book to appreciate it a lot.'
b. Credo il tuo libro, di apprezzar-lo molto
I believe the your book of to appreciate-it much
'I believe your book of to appreciate it a lot'

While Topic and Focus may appear to be the same thing, according to Rizzi, there are several distinct differences between Focus and Topic. Firstly, Focus is quantificational, meaning that Focus makes use of an operator/variable relationship. In other words, the information introduced by the operator is new and the presupposition is a gap (or variable) in the clause, where the gap is bound by the focus operator. Topics, on the other hand, have no such structure. Also, Focus, because of the operator/variable

relationship, exhibits Weak Crossover Effects, something Topics do not exhibit. In other words, when a focused item undergoes movement and crosses over, typically, a possessor in an NP, a coreferential reading is possible, but not likely.

(9) *who_i did his_i mother see t_i

Also, Topic (in Italian), unlike Focus, has a resumptive clitic, while bare quantificational elements (such as “no one” and “everything”) can be Foci but they cannot be Topics.

Likewise, evidence is provided which demonstrates, again in Italian, that relative *wh*-words must precede topics while interrogative *wh*-words follow topics.

(10) a. Un uomo a cui, il premio Nobel, lo daranno senz'altro
 A man to whom the prize Nobel, it they.will.give undoubtedly
 ‘A man to whom, the Nobel Prize, they will give it undoubtedly’

b. * Un uomo, il premio Nobel, a cui lo daranno senz'altro
 A man, the prize Nobel, to whom it they.will.give undoubtedly
 ‘A man, the Nobel Prize, to whom they will give it undoubtedly’

(11) a.* A chi, il premio Nobel, lo daranno?
 To whom, the prize Nobel, it they.will.give?
 ‘To whom, the Nobel Prize, will they give it?’

b. Il premio Nobel, a chi lo daranno?
 The prize Nobel, to whom it they.will.give?
 ‘The Nobel Prize, to whom will they give it?’

Topic is compatible with *wh*-words (they may appear together), while Focus is incompatible with *wh*-words. This suggests that *wh*-words and Focus compete for the same place in the split CP. Finally, according to Rizzi, there can be many Topics in a clause but only one Focus.

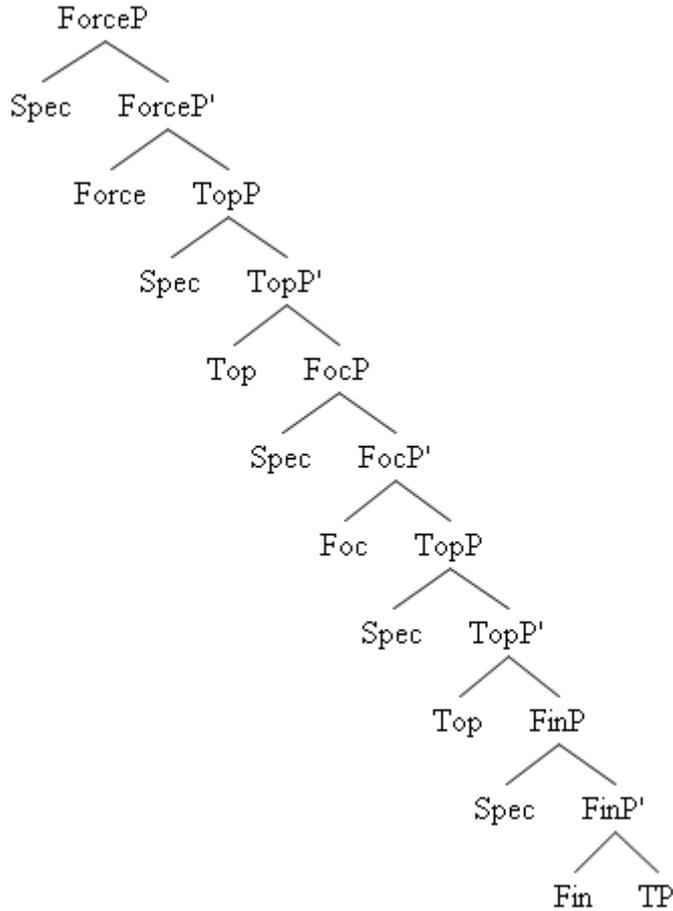
(12) Il libro, a Gianni, domani, glielo daró senz'alto
 The book, to Gianni, tomorrow, him I.will.give for sure
 ‘The book, to Gianni, tomorrow, I will give it to him for sure’

More importantly, though, Topic can precede and/or follow Focus.

- (13) A Gianni, QUESTO, domani, gli dovrete dire
 To Gianni, THIS, tomorrow him you.should tell
 ‘To Gianni, THIS, tomorrow, you should tell him’

The information presented regarding topics and focus motivate the following structure:

- (14)



All the information presented above implies that topics and focus can occupy the left periphery and do so in a predictable, systematic way. All the examples above, taken together, seems to support the hypothesis that the left periphery can indeed be split into several different projections.

2.1 Criticism of the Split CP Hypothesis – Newmeyer (2004)

One motivation for a split CP as noted above is topicalization. It seems a natural assumption that if a topic is fronted, especially one from a subordinate clause, that this topic would somehow be involved in the CP structure. However, in his paper “On split CPs, uninterpretable features, and the ‘perfectness’ of language”, Newmeyer (2004) presents a strong case that topicalization is simply adjunction and not motivated by any projection on the CP. His strongest argument is that while Focus involves an operator/variable relation and therefore is syntactically as well as semantically motivated, Topic does not have any such relation. So if there is an assumed projection on the CP for topics, there lacks a syntactic motivation for whether a topic is fronted or remains in-situ. Newmeyer can account for ordering of fronted items in a way that does not require a split CP.

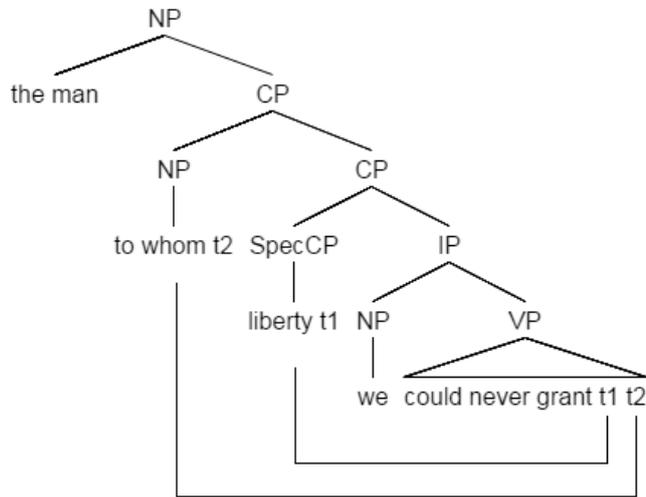
He gives the following examples from p. 403.

- (15)
- a. the man, to whom liberty, we could never grant (Baltin 1982)
 - b. *the man, liberty, to whom we could never grant
 - c. On the table, which dishes are you going to put?¹
 - d. *Which dishes are, on the table, you going to put? (Culicover 1991a)

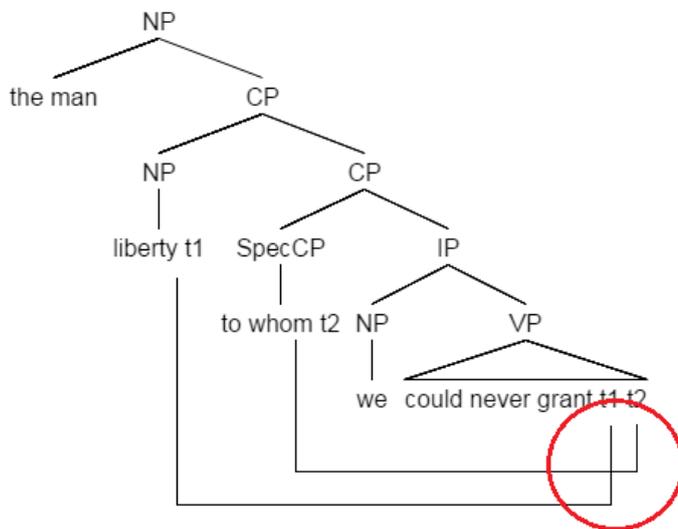
While these examples seem to be evidence for ordering restrictions, and therefore evidence for separate projections in the CP, Newmeyer suggests by tree and movement examples given (p. 303-304) that the ordering is already restricted by the Nested Dependency Constraint (NDC) (Fodor 1978, 1984; Pesetsky, 1987) which states that “multiple filler-gap dependencies may be disjoint or nested, but not intersecting” (p. 403). The movement of topics in (15)b and (15)d cross when preposed from their original clausal positions and violate NDC. Example (16)a below shows the constituents in (15)a moving without intersecting while (16)b shows that the movements in (15)b do intersect (and is circled).

¹ I find this sentence to be only marginally acceptable, and only so with a noticeable parenthetical intonation of the fronted element.

(16) a.



b.



With NDC explaining the ordering restrictions that were the basis for Split CP Hypothesis², Newmeyer then moves his attention to covert movement of Focus. Rizzi

² While Nested Dependency Constraint is presented as a solution to the ordering of fronted items, even Newmeyer (2004) concedes that sentences where he has applied NDC like those in example (23) have a wide range of acceptability and “others like it are clearly bad”(p.404). Sentences that “are bad” are mainly those where the fronted element is an argument, while acceptability improves greatly when the

(1997) argues for LF focus movement as it “sets up an operator- variable relation” (Newmeyer 2004, p. 404), and while there is, of course, no denial of LF focus movement from Newmeyer, he argues that the motivation for the focus movement is weak. His consideration is given because the quantificational feature of focus does fit nicely with LF movement. However, he points out that nearly any kind of word-string can be focused, so focus “movement” does not seem to behave like a syntactic phenomenon. If focus were somehow mediated by features on constituent heads triggering movement, then focus movement would obey or violate island constraints “willy-nilly” (p. 405).³

Another problem with LF movement is that while focus movement may be properly hypothesized due to an operation-variable relation, Rizzi also has LF-topicalization which has no such relation. To compound the issue, Focus has many problems of its own. Some constituents that are possible focuses are not phrasal constituents, and therefore are not maximal projections, and therefore could never undergo movement to SpecFocP. The same is true for contrastive focuses, which, while also not always maximal projections, are sometimes not even on the right branches. Newmeyer concludes that the differences between topics and focuses along with distinct issues with focus do not support a split-CP hypothesis since the distinctive characteristics of focus cannot be resolved by adding a single functional projection within the left periphery.

Another issue raised is that the Split CP analysis is based on the idea that there are “functional projections with semantic or pragmatic relevance” that drive A'-movement (p. 408). Newmeyer points to movements such as Heavy-NP Shift (as in example (17)), that seem to have no apparent projection for the heavy-NP to land.

(17) I saw [yesterday] [*a student who left us five years ago*]

Newmeyer states that the classical analysis of this type of movement has been adjunction to the right. However, he notes that several researchers such as Kayne (1994) and Rochemont (1998) have attempted to derive heavy-NPs through leftward

fronted element is an adjunct. A constraint on extraction of certain elements due to argument/adjunct asymmetry in topicalization may also account for ordering and/or restrictions of fronted elements

³ A footnote of interest as it is not often that the term “willy-nilly” is encountered in an academic paper.

movement, by the attraction of some head, usually assumed to be a Focus head, so that the movement is to Spec of a FocP (p. 408-409). The problem with such an analysis is that, according to Newmeyer, not all heavy NPs are in focus. He is therefore critical of the Spec of FocP approach.

...if Heavy-NP Shift is movement to the left to check off a feature, and it is not necessarily a focus feature, then what semantic or information-structure motivation could the projection have? And if none, then what is the empirical motivation for the leftward movement in the first place? (p. 409)

More problems with the Split CP Hypothesis arise considering the fact that preposed *wh*-elements have information structure properties. In the unmarked case, *wh*-relative pronouns are topics, while *wh*-interrogative pronouns are focuses. Newmeyer states that Rizzi places relative pronouns in SpecForceP and interrogative pronouns in SpecFocP. While the ordering of these *wh*-pronouns is correct in respect to Topic and Focus positions in a split CP, the position of relative pronouns in SpecForceP implies falsely that they type the illocutionary force of a relative clause as a question. A similar problem becomes apparent with interrogative pronouns that are said to be in SpecFocusP. Although this position allows for the syntactic fact that these *wh*-pronouns are focuses, it does not explain how these clauses would then acquire the illocutionary force of a question if Force is higher than Focus in Rizzi's split CP model.

Since Rizzi states that the complementizer *that* is in Force, Focus is said to be lower down in the CP, as in example (18).

(18) I think that, tomorrow, John will leave.

But in languages like Middle English, where fronted *wh*-phrases and the *that* complementizer occur together, the *wh*-phrase precedes the complementizer. He gives the following example.

(19) What that I mene, O swete herte deere? ⁴
'What do I mean, oh dear sweetheart?

⁴ Newmeyer's example is from Chaucer's *Troilus and Criseyde*. Whelpton (personal communication) has pointed out that "What that I mene" is the speaker echoing the statement made in the line before "Yet wist I nevere wel what that he mente". Here, Whelpton states, *what* is a free relative, a fact that will have implications further in this thesis.

Given the evidence above, according to Newmeyer, “two incompatible landing sites for *wh*-movement” need to be posited. One site would need to motivate the syntactic fact that the *wh*-operator is focal and therefore below the complementizer *that* and the other would need to supply interrogative illocutionary force, a position according to Rizzi above the complementizer *that*. Rizzi’s entire approach to *wh*-phrases causes Newmeyer to lament that:

the idea that the illocutionary force of a sentence might be representable as something as simple as a feature of a syntactic projection flies in the face of research on syntax, semantics, and pragmatics of speech act going back to Searle’s work in the early 1970s. (p. 411)

Newmeyer concludes his criticism of the Split CP Hypothesis by noting how “unminimalist”⁵ the notion of a split CP is, “in all its full articulated glory” (p. 412). To him, the conventional CP with one head captures all the syntactic and illocutionary facts of *wh*-phrases best. As far as topicalization is concerned, he suggests that this is a case of adjunction and it would be better to postulate many adjunction rules rather than to assume many distinct semantic projections within the CP.

2.2 More Criticism of the Split CP Hypothesis – Sobin (2003)

More criticism of topicalization comes from Sobin (2003) in his paper “Echo Questions, Echo negation, and Split CP”. Sobin presents evidence that the traditional (un-split) CP system is more suited to handling echo questions than a split CP one, as proposed by Rizzi (1997). Sobin begins as did Newmeyer, with a brief overview of the Split CP Hypothesis. However, Sobin focuses on the Force/Finiteness system in his description, noting that “unless a topic or focus element appears within this layer, forcing apart Force and Finiteness, these two heads/layers combine into a single-headed layer, with a single head carrying features of both force and finiteness (Rizzi 1997: 312-315)” (p. 505). The collapse of two heads into one is central to Sobin’s argument that a split CP is not suited to echo question analysis.

⁵ A reference to Chomsky’s (1995) Minimalist Program

Sobin states that there are two types of echo questions, or EQs. The first is a pseudo EQ and is defined as a normal question to a declarative utterance. By “normal” he means that the question begins with a question word, i.e. a *wh*-phrase. If the utterance echoed is non-declarative (such as a yes-no question) then a pseudo EQ is not possible.

- (20) U: John dated Mary.
E: *Who* did John date? (pseudo EQ)

The second type is known as a syntactic EQ.

- (21) U: John dated Mary.
E: John dated *who*?

These kinds of questions involve four basic features (p. 506):

- (22) a. surprise intonation (↑);
b. ‘COMP freezing’ – an exact copy of the LF (/post-spell out) CP structure of the utterance being echoed;
c. ‘B-binding’ – unselective (C. L. Baker-style) binding in LF of EQ-introduced (D-linked and in-situ) *wh*-phrases (Pesetsky 1987)
d. a ‘copy’, possibly loose, of the non-CP elements of the non-CP elements of being echoed.

Critical to the analysis of EQs is the notion of COMP freeze whereby any syntactic EQ must match the COMP structure of the utterance; so that in example (23), the only proper syntactic echo question to the utterance (a) would be (d) since the COMP data matches that of the utterance (p. 506).

- (23) a. U: [CP [C Did] [IP Mary meet Mozart at the party]]?
[+WH]
b. *E: [CP Who did [IP Mary meet at the party]]?
[+WH]
c. *E: [CP -WH [IP Mary met who at the party]]?
d. E: [CP [C Did] [IP Mary meet who at the party]]?
[+WH]

Sobin also notes that certain constructions of syntactic EQs that would normally not be possible (i.e. judged grammatical) because of a Superiority violation are explained by the aspect of COMP freezing. For example, (24)a is normally considered ungrammatical, due to a Superiority violation; i.e. the dependency between the filler (in this case, *what*) and its gap (_) is interrupted by a *wh*-phrase (in this case, *who*) which is syntactically superior to the gap. (24)b is the only acceptable representation for this clause involving both *wh*-phrases.

- (24) a. *What did who eat _ at the party?
 b. Who ate what at the party?

However, the acceptable EQ to the utterance in (25)a would be (25)b since it retains the exact copy of the CP structure of the utterance.

- (25) a. U: [CP What did [IP Bill eat at the party]]?
 b. E: [CP What did [IP who eat at the party]]?
 c.*E: [CP Who [IP ate what at the party]]?

Also important to the construction of syntactic EQs is the concept of unselective binding or B-binding. The frozen layer in the CP will typically lose its interrogative force in syntactic EQs. To ensure that the EQ is indeed a still a question, a B-binder is introduced which binds the in-situ *wh*-phrase so that only the “B-binder and the co-indexed in-situ *wh*-phrase which it binds have interrogative force” (p. 507). The consequence of this binding is that an EQ introduced by a *wh*-phrase will receive a response to the in-situ *wh*-phrase rather than to one that introduces the question. So, in example (26), the B-Binder (Q) binds *who* in the IP and receives interrogative force, while *what* in the frozen CP and loses its interrogative force.

- (26) E: [CP Q_j [CP What_i did [IP who_j eat at the party t_i]]]?

Contrary to the frozen elements in CP are the elements that are not in the CP and therefore are not frozen in position in EQs, so that (27)a can have an acceptable EQ that is either passive (b) or active (c).

- (27) a. U: Bill said that Mary was kissed by Mozart.
 b. E: Bill said that Mary was kissed by who?

- c. E: Bill said that who kissed Mary?

Where an interrogative appears in the CP in an utterance, two acceptable EQ responses are not possible.

From the above information, Sobin investigates whether a split CP can accommodate the syntax of EQs as “neatly” as the conventional CP does (p. 509). According to Sobin, the splitting of Force and Finiteness is exactly where there is a problem with Rizzi’s Split CP Hypothesis. Sobin notes that the verb *know* can take either a declarative (e.g. *that*) complement or an interrogative (e.g. *whether*) complement. Using Rizzi’s characterization of the CP, EQs for utterances with the verb *know* and either a declarative or interrogative complement appear to freeze Force in place (for example, *whether* cannot be used to echo an utterance which has complementizer *that*).

- (28) a. U: Bill knows that Mary kissed John
b. E: Bill knows that Mary kissed who?
c. *E: Bill knows whether Mary kissed who?
- (29) a. U: Bill knows whether Mary kissed John
b. E: Bill knows whether Mary kissed who?
c. *E: Bill knows that Mary kissed who?

Furthermore, in English, the declarative complementizer *that* is optional in certain utterances and can therefore be optional in the EQ. However, the previously mentioned assumption is that Force and Finiteness collapse into one head. A further assumption by Rizzi is that overt *that* is in Force but null *that* is in Finiteness. If the assumption is made that no collapse between Force and Finiteness takes place (Sobin doubts that is should), then the correspondence between the utterance CP structure and that of its syntactic EQ becomes unclear. If, for example, an utterance with overt *that* is echoed with null *that*, then it appears that Finiteness is frozen while Force is not. This is the opposite of what is demonstrated with declarative and interrogative complements.

- (30) a. U: Bill knew that Mary liked cigars
b. E: Bill knew Mary liked what?

Unfortunately, the situation, according to Sobin, does not improve if the collapse of Force and Finiteness is assumed to take place. He states that the correspondence of the CP between the utterance and EQ becomes worse where a topic such as an adverbial has been fronted in an utterance. The EQ can have the adverbial fronted or in-situ within the subordinate clause and be acceptable, hence demonstrating that it is not part of a frozen COMP. The same holds partly true for non-interrogative focus items. They require in-situ reading within their clause in EQs, regardless of their previous fronting in the utterance. Unlike fronted adverbials, however, fronted non-interrogative items cannot remain fronted in the EQ due to possible clausal type conflict. Sobin does concede that utterances with *wh*-phrases fronted to Focus do appear to exhibit COMP freezing; however Sobin contends that this observation demonstrates the inconsistency of a split CP analysis with syntactic EQs.

In his closing arguments against a split CP, Sobin points out that other matters also support his view. He states that in English at least, Topic elements are incompatible with fronted *wh*-phrases and that “Topics and AvPs show a parenthetical intonational pattern which is unexpected from the point of view of a split CP analysis” (p. 515). Also, he recalls the same argument by Newmeyer (2004) with regards to a ‘doubly-filled Comp’ in Middle English, stating that a phonetically realized complementizer is always to the right of a *wh*-phrase.

Finally, Sobin examines another echo phenomenon, which he calls ‘echo negation’ (EN) (p. 516) using the following Negative Inversion (NI) sentence:

- (31) U: Rarely does he order pizza with pineapple.
 a' ... [FocP Rarely [Foc° does]...[IP he order pizza with pineapple]]

The NI construction is said to parallel the split CP analysis of questions since the negative expression occupies the same Focus position that a *wh*-phrase would and tense is inverted as would be the case in a question.

In a EN to the utterance in (31)a, a second negative element is inserted (p. 516):

- (32) EN: Rarely DOESN'T he order pizza with pineapple!

The new negative element sounds a bit strange, similar to a newly inserted *wh*-phrase in an EQ and like inserted *wh*-phrases; the inserted negative is also stressed. Since questions and NIs are reported to have similar CP constructions and that EQs and ENs share some parallel observations, Sobin hypothesizes that perhaps EQs and ENs share other properties. However, he states that while newly inserted *wh*-phrases in EQs “take wide scope (in the sense of having “root” interrogative force)” (p. 517), this is not the case with an inserted negative in an EN which has a narrow scope to the already present negative. Moreover, while an already present *wh*-phrase loses its interrogative force, the present negative retains its semantic force.

A final argument against comparing EQs and ENs is that while an EQ is formed using a frozen CP layer from the utterance, the CP is not frozen in ENs as shown by the following EN to that of (31)a (p. 516):

(33) EN: He rarely DOESN'T order pizza with pineapple!

Since EQs and ENs behave differently than would be expected considering, as noted before, that their utterance counterparts of questions and NIs are argued to have the same split CP analysis, it is doubtful that the split CP analysis is correct in this case. With this observation combined the arguments presented using syntactic EQs, Sobin concludes that the evidence suggests that EQs are best represented using the traditional (non-split) CP configuration.

2.3 Topicalization as Adjunction

The criticism by Newmeyer(2004) of topicalization within the Split CP Hypothesis combined with that of Sobin's (2003) observations that fronted adverbials do not remain frozen in COMP but return to their in-situ position in echo questions strongly suggests that topicalization is not involved in the CP and should be treated as adjunction.

A final criticism regarding topicalization is its parenthetical intonational pattern. Sobin (2003) notes this pattern is “unexpected” if the CP were indeed split. What he means is that items that are traditionally considered to be in the CP generally do not create a pause in speech, and even some fronted items traditionally considered to be in the CP

such as Negative Inversion do not create this intonational pattern. The parenthetical intonational pattern of topicalization is a further indication that it is different from other items in the CP and probably should not belong in the split CP cartography. However, removing topicalization from the split CP model weakens the hypothesis but does not necessarily dismiss it.

2.4 Focus – Only Wh-Movement to the CP

The other major element involved in splitting the CP is Focus. As mentioned, Focus involves an operator/variable relation that topicalization lacks. The simple cleft construction in English demonstrates this relation clearly. So, in a sentence such as:

(34) John has a problem with his car

a simple cleft can be constructed by creating a focus phrase where an operator has been extracted, followed by the presupposition containing the bound variable.

(35) It is his car that John has a problem with _

Returning to the work of Newmeyer (2004), he states that while a syntactic motivation for Focus in the CP is present, not all possible focuses are phrasal constituents, and therefore are not maximal projections and could not undergo movement to SpecFocP. He also states that many contrastive focuses cannot undergo movement because they are not always maximal projections, and are sometimes not even on the right branches; this means that many items that fit a Focus criterion may not be possible items to fill SpecFocP.

The only focus items that necessarily undergo movement to fulfill their scope requirements are *wh*-phrases, i.e. *wh*-movement. Note here that Sobin (2003) concedes that utterances with *wh*-phrases fronted to Focus do appear to exhibit COMP freezing, so they do appear to be in the CP and that has always been the canonical interpretation; that complex and simple *wh*-phrases move to SpecCP. The problem with a split CP analysis is that Rizzi has *wh*-relative pronouns in Spec of Force and interrogative *wh*-pronouns in SpecFocP. The reason for this is that preposed topics tend to follow *wh*-relative pronouns and precede *wh*-interrogative pronouns. Yet, Newmeyer complains

that this creates more problems than it solves since *wh*-phrases have information structure properties that are not properly fulfilled by a split CP. Compounding the issue is that fact that it has just been argued above to exclude topics from the split CP. However, regardless of arguments made concerning the viability of topicalization and focus in a split CP, *wh*-movement remains firmly in the domain of the CP as it has traditionally been assumed. Given these conclusions, a new approach to the Complementizer Phrase may be required.

3 An Alternative View of the Split CP – Van Craenenbroeck (2007)

An alternative analysis of the split CP model proposed by van Craenenbroeck (2007) may be a plausible approach to the CP and a possible solution to Newmeyer's information structure complaints involving the illocutionary force and syntactic focus of *wh*-phrases in a split CP. By examining *wh*-movement and relying on a series of unpublished papers by Reinhart (1986, 1987, 1990), van Craenenbroeck begins his work by discussing the differences and similarities between complex and simple *wh*-phrases. One difference is exemplified by the following example.

- (36) a. * What did who buy?
 b. ?What did which boy buy?

While (36)a is ungrammatical, presumably due to a Superiority violation (specifically, the Attract Closest principle (Chomsky 1995, p 296 as cited on p. 2), the judgment, according to van Craenenbroeck, improves when the simple *wh*-phrase is replaced by a complex one as in (36)b. Van Craenenbroeck argues that the difference between the two examples is that while *who* is a syntactic operator, *which boy* is not.⁶ As both *who* and *what* in example (36)a are syntactic operators, the ungrammaticality is due to the failure of C, which, according to Craenenbroeck, has an operator feature, to attract the closest item bearing that feature.

The second set of data offered by van Craenenbroeck deals with in-situ *wh*-adjuncts. (The data is from Reinhart, 1990)

⁶ Van Craenenbroeck references Pesetsky (1987:108) but notes that Pesetsky's distinction of the differences between the two *wh*-types is discourse related, while his own is structural.

- (37) a. * Who fainted when you behaved how?
b. Who fainted when you behaved which way?

He states that simple *wh*-adjuncts cannot be left in-situ inside a *wh*-island; they need to move from their position in LF to their scope taking position at S structure fulfilling their role as syntactic operators. Complex *wh*-phrases, on the other hand can remain in-situ throughout the derivation.

The third and final set of data presented exemplifying the differences

- (38) a. *Which grade did his teacher give who?
b. ? Which grade did his teacher give which student?

Van Craenenbroeck then moves on to the similarities between simple and complex *wh*-phrases. For example, they are both able to type a clause as a *wh*-question.

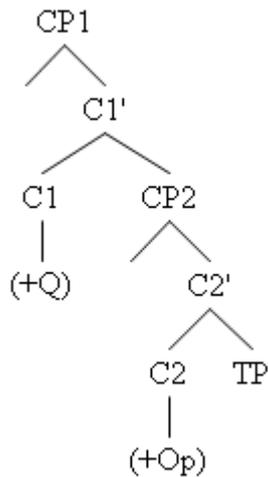
- (39) John wondered who/which person saw Mary.

And although according to van Craenenbroeck, complex *wh*-phrases are not syntactic operators, they co-occur with an empty operator that handles the operator variable binding relation. So, like simple *wh*-phrases, they display operator-variable dependencies. In other words, they can co-index their trace, are both sensitive to Weak Crossover effects and both can also license a parasitic gap⁷.

In order to account a situation within the syntax that must allow for a complex *wh*-phrase and an empty operator, van Craenenbroeck employs two functional projections for the structure of the left periphery: a higher one related to clause typing and a lower one that hosts operators as in the following example. He notes that the two projections are not innovations on his part but are the projections ForceP and FocusP in Rizzi's (1997) model. Furthermore, van Craenenbroeck stipulates the head of CP1 has a question feature [+Q] that needs to be checked and the head of CP2 has an operator feature [+Op]. The information he provides produces the following model.

⁷ A parasitic gap is a gap that appears dependent on another gap.

(40)



Van Craenenbroeck argues that simple *wh*-phrases move first to specCP2 where they check an operator feature [+Op] and then to specCP1 to type the clause. Complex *wh*-phrases behave differently because, according to van Craenenbroeck, they do not check the operator feature of specCP2 since they are not syntactic operators [-Op], and instead are base generated in specCP1 where they then also type the clause. The operator - variable dependency of complex *wh*-phrases would be checked by “empty operator movement” from the IP to specCP2 (p.6). However, while the complex *wh*-phrase can merge in specCP1, “in a multiple *wh*-question (where it is not required to type the clause) it can just as easily be merged in an argument position. In such a case...the lack of a [+Op]-feature implies that the *wh*-phrase remains in that position throughout the derivation” (p. 6). This difference explains the acceptability of examples (36)b, (37)b, and (38)b above.

To expand the data set, van Craenenbroeck examines the work of Hoekstra (1993) who notes that simple and complex *wh*- phrases behave differently in Frisian, which is a language “that obligatorily violates the doubly filled COMP filter”⁸ (p. 7).

- (41) a. Hy frege, wa (of) ‘t jûn kaam
he asked who if that tonight came
‘He asked who came tonight.’

⁸ Frisian violates the doubly filled COMP filter by requiring that whenever the SpecCP is filled in a *wh*-question, the head position of that projection must also be overtly spelled out.

b. Ik frege, hokker stik *(of) 't se lêzen hie.

I asked which article if that she read had

'I asked which article she had read.' (Frisian, Hoekstra 1993:3)

The data from example (41) demonstrates that simple *wh*-phrases can be followed by 't "that" or by *of* 't "if that" while complex *wh*-phrases can only be followed by 't "that". Following the work of Hoekstra (1993) and others (see page 7), van Craenenbroeck assumes that *of* "if" occupies the upper CP and 't "that" occupies the lower one. The pattern exhibited implies that simple *wh*-phrases could remain "in-situ" in specCP2 to allow for its derivation where only 't is realized or move into specCP1 and allow for the spellout of both complementizers in the process. This variable positioning of simple *wh*-phrases adds another assumption about his split CP analysis. Van Craenenbroeck defends this new assumption by noting that Doubly Filled COMP in a certain dialect of Dutch also exhibits similar differences concerning simple and complex *wh*-phrases with simple ones occurring both to the right and left of the complementizer *of* "if" and even between the two *of* "if" and *dat* "that" and complex ones only occurring to the left of *of* "if". This data not only supports his split CP analysis but also that simple *wh*-phrases can remain in-situ in specCP2.

More data in support of his split CP analysis comes from 'swiping' in English when certain sluiced *wh*-phrases strand their prepositions as in example (42).⁹

(42) Ed gave a lecture, but I don't know *what about*

Noting that simple *wh*-phrases can strand their preposition, but complex ones cannot, van Craenenbroeck introduces the possibility that his model of the CP can properly explain the phenomenon. He says that if his assumption about the movement of simple *wh*-phrases is correct then the *what* in example (42) above strands its preposition in the specCP2 position when it moves there to check its operator feature. Again, this is not an option for complex *wh*-phrases as they never move through the specCP2. Furthermore it cannot be postulated that the empty operator pied-pipes the preposition to the specCP2 as "empty operators cannot pied pipe overt material" (p. 9).

⁹ 'Swiping' is an acronym from Sluiced Wh-word Inversion with Prepositions In Northern Germanic, and was coined by Merchant (2002).

A similar pattern emerges with the analysis of *wh*-copying in German, where two instances of a simple *wh*-phrase can appear in a clause, with the higher *wh*-phrase being the only one that is interpreted. As before *wh*-copying is not permitted with complex *wh*-phrases and again, van Craenenbroeck argues that this is because *wh*-phrases are base generated in specCP1 and do not move there through specCP2. In contrast, simple *wh*-phrases move through specCP2 and leave a trace that can therefore be spelled out.

As his paper continues, the contrast between simple and complex *wh*-phrases also continues, such as in preposition stranding, free relatives, and “spading” in Dutch. Dutch does not allow preposition stranding with simple *wh*-phrases “judgments improve dramatically – often up to full acceptability – when complex *wh*-phrases are used (p. 11)”. As noted before in “swiping”, empty operators cannot pied-pipe overt material so instead, the empty operator strands the preposition in its movement up to specCP2.

For free relative analysis, van Craenenbroeck takes a different approach to the problem. He suggests that because Dutch, as well as German, only allow only a simple *wh*-phrase to introduce a free relative, his split CP analysis must be “truncated” with only the lower CP2 present. Since simple *wh*-phrases can move through specCP2 as well as occasionally occupy that position as demonstrated by doubly filled Comp in Frisian and dialectal Dutch, it makes sense that free relatives can be represented by only CP2. The lack of CP1 in the derivation deprives complex *wh*-phrases of a place to be base generated and explains their absence from free relatives. Furthermore, data from Dutch demonstrates that *dat* “that” appears with definite free relatives while *of* “if” never does. This data fits with a truncated model which would not permit the complementizer *of* “if”, but allow *dat* “that” if these complementizers occupy the head C of CP1 and CP2 respectively, as previously mentioned.

Combining all the data given in the paper¹⁰, van Craenenbroeck concludes that his analysis of a split CP with one projection for clause typing and the other for operator/variable dependencies is a viable one.

¹⁰ In his paper, Van Craenenbroeck also includes the concept of “spading” (short for Sluicing Plus A Demonstrative In Non-insular Germanic) which is far more complicated than any of the previous data presented and therefore is summarized here. However, the empirical evidence obtained is consistent with the differences between the two *wh*-phrase types and fits with the hypothesized two CP model.

3.1 Issues with van Craenenbroeck's Model

One major problem facing van Craenenbroeck's analysis of complex *wh*-phrases, one which he openly acknowledges, is that the base generation of complex *wh*-phrases does not allow for reconstruction.

(43) [Which friend of her_i's] did [every student]_i invite?

In the above example, the pronoun *her* is bound by the QP *every student* even though the QP does not c-command the pronoun at spellout, but does so at LF.

(44) LF: <which friend of her_i's> did [every student]_i invite <which friend of her_i's>

Van Craenenbroeck argues for a semantic, rather than a syntactic theory of reconstruction to account for the binding issue in the above example.

Regardless of whether a semantic theory of reconstruction is plausible, a more serious problem with van Craenenbroeck's analysis is that of case of the complex *wh*-phrase. While problems of case are not obvious in minimally inflected English, they become immediate in more inflected languages such as Icelandic.

(45) Jón sá maninn_{acc} sem María kyssti

Jon saw man.the that Maria kissed

Jon saw the man that Maria kissed

(46) Jón sá maninn_{acc} sem kyssti Maríu

Jon saw man.the that kissed Maria

Jon saw the man that kissed María

In Icelandic, the head of the relative clause is assigned accusative case by the matrix verb, *sá*. However, this situation is not the same with embedded clauses containing a complex *wh*- phrase.

(47) Jón sá hvaða mann_{acc} María_{nom} kyssti t_{acc}

Jon saw which man María kissed

(48) Jón sá hvaða maður_{nom} t_{nom} kyssti Maríu_{acc}

Jon saw which man kissed Maria

With complex *wh*-phrases (as with simple *wh*-phrases), case is assigned to it by the verb in the subordinate clause, *kyssti* as would be expected if canonical *wh*-movement has taken place and the *wh*-phrase has raised from its case assigned position in the subordinate clause to its scope position in the CP. This case assignment is made clearer in matrix *wh*-question clauses.

- (49) Hvaða maður_{nom} kyssti Maríu_{acc}?
Which man_{nom} kissed Maria_{acc}?
Which man kissed Maria?
- (50) Hvaða mann_{acc} kyssti María_{nom}?
Which man_{acc} kissed Maria_{nom}?
Which man did Maria kiss?

If, as van Craenenbroeck hypothesizes, the complex *wh*-phrase is base generated in CP₁, then it has no way of receiving case from the subordinate verb. His solution to the problem of reconstruction is to allow the complex *wh*-phrase to move “in one fell swoop” to the higher CP and then have the empty operator base generated in the lower CP¹¹. It is clear from observations involving the co-indexing of a trace, WCO effects and the licensing of parasitic gaps that complex *wh*-phrases have the same operator/variable relationship that simple *wh*-phrases have in embedded clauses, so it is uncertain what mechanism would allow a complex *wh*-phrase to simply skip over the operator checking feature of the lower CP in his own model.

Disregarding the flaws for the moment, his analysis of Force and FocusP in a split CP addresses many of the problems cited by Newmeyer in regards to *wh*-movement in indirect question clauses. However, the analysis does not address the force of relative pronouns. Due to similarities with interrogative clauses, the topic which I will now turn attention to at this point is one only briefly mentioned by Newmeyer and unmentioned by van Craenenbroeck, which is that of relative clauses.

¹¹ In van Craenenbroeck’s original assumption of base generated complex *wh*-phrases, morphological case on the *wh*-phrase was, according to him, “the result of the indexing relation with the empty operator in SpecCP”.

4 Restrictive Relative Clauses and Wh-Phrases

A relative clause is formed when a relative pronoun or complementizer appears together with the nominal head. The relative clause functions as a post-modifier of the head.

There are two types of relative clauses – restrictive and non-restrictive.

Non-restrictive relative clauses are generally considered to be NP adjuncts and give only additional information about the head whose reference is independently established. Prosodically, there is a slight pause between the head nominal and its relative clause; they must contain a relative pronoun and never the complementizer *that*.

(51) [[The Earth], which is round] ...

(52) *[The [Earth that is round]]...

Restrictive relative clauses are different than non-restrictive relative clauses in that they are traditionally treated as right adjoined to the N-bar and are necessary modifiers. This means that they restrict the set of entities referred to by the nominal head and help pick out its referent. For this thesis, I will focus solely on the properties of restrictive relative clauses.

(53) Here is the [man who Mary kissed]

(54) Here is the [man that Mary kissed]

Headed relatives can also sometimes lack a relative pronoun or a complementizer

(55) Here is the [man Mary kissed]

There are different analyses for *wh*- and *that*- relatives. With *wh*- relative pronouns the relative pronoun is a kind of operator binding a trace, and the C^0 position is empty. In *that*- relatives the Spec CP contains a null operator and the relative complementizer *that* appears in C^0 . In relative clauses where no relative pronoun or the complementizer *that* appears (also known as a zero relative), the Spec CP contains a null operator and the C^0 contains a null complementizer or possibly remains empty.

Returning to the Newmeyer, he correctly notes that relative pronouns occupying SpecForceP of a split CP would mistakenly imply that they type the illocutionary force of the clause. Relative pronouns are not interrogative, but by placing an interrogative element in a Force projection of a split CP would, according to Newmeyer, (falsely) give the clause interrogative force, validating yet another reason to dismiss the Split CP Hypothesis.

However, it is unclear how Newmeyer would solve the illocutionary force problem in a traditional CP. In a traditional CP, a relative pronoun would occupy SpecCP, the same position as an interrogative pronoun. The only way around the problem is to assume that interrogative pronouns and relative pronouns have different features: interrogative pronouns are [+*wh*] while relative pronouns are [-*wh*]. Taken further, interrogative and relative pronouns could be considered two separate lexical items. Newson et al. (2006), states that this idea is supported by the fact that in some languages there are differences between relative and interrogative pronouns. For example, he observes that in Hungarian, there is a systematic difference between interrogative pronouns and relative pronouns, with relative ones beginning with “a”; so that interrogative *who* would be *ki* – and relative *who* would be *aki*. Nevertheless, relative and interrogative *wh*-elements seem too closely related, at least in English, to be considered separate lexical items, considering that both are interpreted as operators in either interrogative or relative clauses. Newson et al (2006) states:

The fact that one is interpreted more like a quantificational operator, like quantificational pronouns such as everyone or someone, while the other is interpreted like an anaphoric operator, which is referentially dependent on some other element in the sentence, like a reflexive pronoun such as himself, falls out due to the different functions of questions and relative clauses: one asks a question and the other modifies a noun. (p. 269)

4.1 Wh-Phrases and Relative Clauses

One observation that may help account for syntactic differences of *wh*-phrases in the CP is contained in a paper by van Gelderen (2004) called “The CP and split CP cross-

linguistically”,¹². The bulk of van Gelderen’s paper focuses on the complement selection by the certain classes of verbs and the ability of each class to facilitate a split CP in English Verbs can be divided into two types: factive¹³, such as the verbs *know* or *regret* and non-factive such as *believe* or *assert*. Factive and non-factive verbs can be further divided into emotive verbs (e.g. factive *regret* and non-factive *intend*) and non-emotive verbs (e.g. factive *forget* and non-factive *say*). According to van Gelderen, *it*-pronominalization and paraphrasing through *the fact that* are possible with factives but not with non-factives. She gives the following data (her examples 49 and 50 on p. 13):

- (56) a. They regret it that Hittite is extinct (no examples in the BNC)¹⁴
 b.*They believed it that Hedwig had brought that message.
- (57) a. Many Americans regret the fact that they now discuss sport with the passion that 200 years ago they brought to every day debates... (BNC-ABD 752)
 b.*Many Americans believe the fact that they now discuss...

Van Gelderen then notes that ECM constructions, passive raising and embedded topics are generally possible with non-factives but not with factives:¹⁵

- (58) a. I believe/*regret him to be nice
 b. He was believed/*regretted to be nice
 c. He believed/*regretted that this book she reads often

According to van Gelderen, a verb like *believe* would lack a CP in ECM clauses (and this is the reason that it allows passive raising – the object can move to subject position due to the lack of a CP boundary.) On the other hand, van Gelderen states that factive verbs are typically split CPs, suggesting the reason that these factives do not allow embedded topics is that the SpecForceP is covertly filled with *the fact that* and

¹² . It should be acknowledged that van Gelderen accepts Rizzi’s split CP hypothesis, even though it has been argued earlier that topicalization should be treated as adjunction and *wh*-movement is the only focus occupying the CP. Here, I entertain van Gelderen’s analysis for expository purposes.

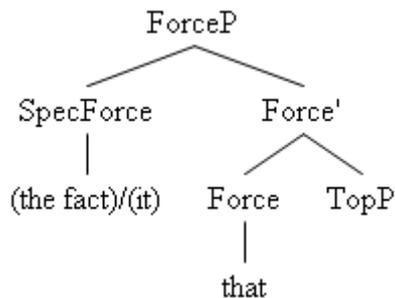
¹³ A factive verb is one that presupposes the truth of its complement clause.

¹⁴ Van Gelderen notes that there are no examples of *regret it that* in the British National Corpus. I have also searched the BYU Corpus of Contemporary American and Google Books (American) and also cannot find any examples. The status of this data is therefore in doubt.

¹⁵ Van Gelderen acknowledges that not all factives work the same as non-emotive “know” allows ECM.

movement of topics is blocked, “perhaps because the entire proposition is presupposed, i.e. the topic” (p. 16). She proposes the following model:

(59)



Only factives would have the structure represented by example and therefore have a split CP. Verbs that allow ECM clauses have either an un-split CP or the clause is simply an IP.

The reason van Gelderen gives for this model is that *it*-pronominalization and paraphrasing through *the fact that* are possible with factive verbs but not with non-factive ones. Van Gelderen goes on to state that factive verbs are typically split and do not allow embedded topics since, she presumes, SpecForceP is covertly filled with “it” or “the fact that” and movement of topics is blocked. She gives the following evidence (her examples (63)a and b on p. 15):

- (60) a. John believes that this book, Mary has read many times. (non-factive)
 b. ?* John regrets that this book, Mary has read many times. (factive)

Unfortunately, van Gelderen does not supply a rationale as to why the pronoun *it* or the determiner phrase *the fact* should be in the CP and not outside it in a DP other than to “block” topicalization, which, oddly enough, using Rizzi’s model, would never land in the SpecForceP but would follow *that*. If the reason that topicalization cannot occur in factives is because, as van Gelderen hypothesizes, that “perhaps because the entire proposition is presupposed, i.e. the topic” (p. 16), then this semantic reason should be enough to restrict the movement of the topic instead of a formulation of a syntactic one.

However, *it/ the fact that* model should not be dismissed outright. As a factive, the verb *regret* means to be disappointed about something that has happened or one has done.

The key word in that definition is “something”. This means that very often, as van Gelderen observes, the verb *regret*, like other factives, is followed by a DP, whether it be “it” or “the fact”, or something similar. In a sense then, all embedded clauses of factives could be considered to have a structure similar to that of a relative clause. Consider the following examples:

- (61) a. John regrets that he made a mess of his life
 b. John regrets *the fact* that he made a mess of his life
 c. John regrets *the mess* (that/which) he made of his life

Examples (61)a-d have the an equative meaning. Van Gelderen’s model would have a covert *it/the fact* in (61)a¹⁶. However, there are two major differences between the overt *the fact* clause of (61)b, and a relative clause of (61)d. Firstly, *the fact* nominalizes the entire subordinate clause and have no trace co-indexing to the clause, so a sentence like (61)b is grammatical even if *the fact* is elided, a change that would make the relative clause ungrammatical. Secondly, because *the fact* appears to be base generated as a complement to the matrix verb and does not raise out of the subordinate, it therefore does not require an operator. Indeed, sentences (61)b and c would be ungrammatical with a *wh*-relativer. Nonetheless, there remains in these clauses a fundamental element found in relative clauses: a nominal item modified by a clause.

Similar issues arise in sentences such as (62):

- (62) a. John regrets the times *when* he has spoken too quickly
 b. John knows the person *who* Mary was speaking to

Again the DP *the times* and *the person* can be elided and the sentence remains grammatical, a similar result to that of *it/the fact* clauses. In (62), however, there are relativizers, the *wh*-adverb *when* and the *wh*-pronoun *who*, which both have an operator function. This observation suggests that indirect questions involving simple *wh*-phrases could syntactically be relative clauses. In other words, a nominal head for an indirect *wh*-question clause could be syntactically present but phonologically empty. Complex

¹⁶ Covert nouns and pronouns are nothing new to linguistics. But see Kayne 2010, p. 82-94 for a rather interesting and relevant discussion involving r pronouns.

wh-phrases, on the other hand cannot be assumed to have a syntactically present but phonologically empty head since the nominal head can never be overt.

(63) John knows *which man* Mary was speaking to

(64) *John knows the person *which man* Mary was speaking to

The asymmetry between simple and complex *wh*-phrases in regards to relative clause-like constructions may be a reason for the differences between the two items observed by van Craenenbroeck and others.

Since there seems to be an intricate, inseparable relationship between embedded interrogative constructions and relative clause constructions, a closer examination of the syntactic structures of these clauses is required.

4.2 Relative Clause Structures – Three Competing Theories

The analysis of relative clauses has often been debated (Lees 1960, Chomsky 1965, Vergnaud 1974, Kayne 1994, Borsley 1997, Bianchi 2000, Sauerland 2000). The following information is a brief overview of three of the most widely accepted theories of relative clause construction.

4.2.1 The Head External Analysis

The head external analysis is the most commonly cited model for the syntactic representation of relative clauses. The theory is that the head originates outside of the relative clause CP and that the relative clause CP is formed by an operator raising to the CP from the subordinate clause by A'-movement. The operator can be either overt or covert.

(65) [DP [D the][NP [N book][CP [*Op/which*]_i[TP Mary read *t_i*]]]]

Crucial to the head external analysis is that the head NP is never inside the relative clause CP, so it cannot be reconstructed into a relative clause internal position. The head

external analysis has fallen out of favor primarily due to the issue of reconstruction, which will be examined next.

4.2.1.1 Problems with the Head External Analysis

As an observation first made by Brame (1968), it is widely accepted that certain idiomatic relative clause constructions require the head to be interpreted as a complement of the internal verb.

(66) The headway that Mary made was impressive

This example requires that the head NP *headway* be interpreted as the complement of the verb *made*. The relation between the verb and the NP can be demonstrated with a *wh*-question construction.

(67) What headway_i did Mary make *t*_i ?

Condition A of the Binding Theory states that an anaphor must be bound within its own domain.

(68) The picture of herself that Mary showed John

In order to account for the grammaticality of example (68), the anaphor *herself* needs to be interpreted as bound by the proper name *Mary*, in a position that is clause internal.

Again, the relationship between the anaphor and its antecedent can be demonstrated by a *wh*-question construction.

(69) Which picture of herself_i did Mary show *t*_i John?

And also in similar binding environments:

(70) The pictures of her mother that every girl brought

Once more, the relationship of the bound pronoun *her* by every girl can be demonstrated by a *wh*- question.

(71) How many pictures of her mother did every girl bring?

One final example that requires a raising analysis of relative clauses is that of the subject/verb agreement exhibited in constructions where the head of the relative clause

must be interpreted in the subject argument position of the subordinate verb to account for the form of the verb.

(72) The teacher counted *the girls* that *were* in the classroom

(73) *The teacher counted *the girls* that *was* in the classroom

Given the evidence above, a head external analysis cannot be the correct derivation for relative clauses. This fact has given rise to two competing theories that can account for reconstruction effects encountered in relative clause constructions. One solution has been to raise the internal nominal out of the relative clause into the head position of the clause through movement.

4.2.2 The Head Raising Analysis

The main feature of the head raising analysis is that the head of the relative clause (in many analyses – an NP) originates inside the relative clause CP. The head then raises to its position either external or internal to the CP, depending on different incarnations of the theory.

(74) [DP [D the][NP [N book]_j[CP [Op/which t_j]_i[TP Mary read t_i]]]]

4.2.2.1 The Head Raising Analysis- Kayne (1994)

The head raising analysis is not new to the field; Bhatt (2002) notes that others have proposed different versions, including Brame (1968), Schachter (1973), and Vergnaud (1974). However, the analysis has been recently revived by Kayne (1994) and furthered by Bianchi (2000). In Kayne's analysis, he argues that the heads of relative clauses are not generated in-situ but instead raise from their argument position from the verb inside the subordinate clause leftward along with their modifiers to SpecCP.

Kayne's version of the Raising Analysis is a direct result of his monograph, "The Antisymmetry of Syntax". In this work, he proposes a restriction of phrase structure he calls the Linear Correspondence Axiom (LCA) in which asymmetrical c-command "maps into linear precedence" (Borsley 1997). One implication is that the LCA only

permits leftward movement – there is no right adjunction. LCA has implications for many analyses of syntax that have been traditionally accepted. One of these is the analysis of relative clauses which has generally been viewed as right adjoined to N-bar or NP.

Independent proposals have been made to satisfy the LCA restriction, such as Platzack's (2000) paper that argues that restrictive relative clauses are sisters, and therefore complements to the lexical N^0 . While this proposal satisfies LCA, Kayne (1994) suggests that relative clauses are selected by a functional D^0 as its complement. This follows along the same line as Longobardi (1994), who argues that argument phrases are always introduced by a D. The idea that some CPs are complements of a determiner is not new (see Adger and Quer, 2001 for unselected embedded questions and Abney, 1987 for gerundive constructions). And CPs often appear to be nominal "as they often resemble demonstrative pronouns, *wh* elements, certain kinds of nouns ("fact", etc.), etc" (Rizzi 1997). The following is a representation of Kayne's model.

(75) [DP D^0 CP]

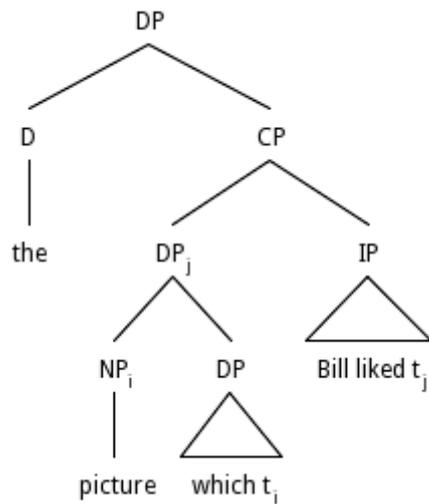
A further idea of Kayne's is that the nominal head of the relative clause is created by raising the appropriate nominal category from inside the relative clause to the Spec CP position head by the DP.

According to Kayne, in *wh*-relatives, the raised element is a DP while in *that*-relatives, it is an NP.¹⁷

(76) [DP the [CP c^0 Bill liked [DP which [NP picture]]]]

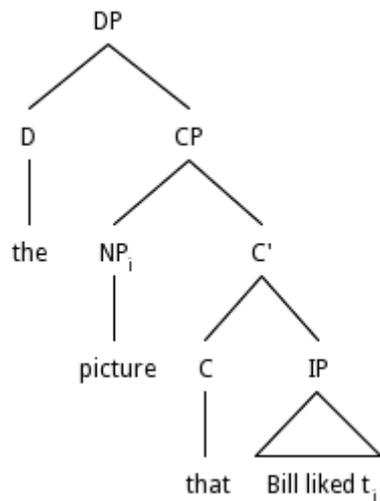
(77) [DP the [CP [DP [NP picture]i which ti]j c^0 Bill liked tj]]]

¹⁷ These examples violate the Doubly Filled Comp rule which states that SpecCP and C cannot both contain lexically overt material.



(78) [DP the [CP that Bill liked [NP picture]]]

(79) [DP the [CP [NP picture]_j that Bill liked t_j]]



4.2.2.2 Criticism of the Raising Analysis – Borsley (1997)

There are, however, also problems with Kayne's analysis, and these problems have not gone uncriticized. Borsley (1997) begins his criticism by examining the non-wh relatives in Kayne's raising analysis. In an example such as the one above,

(80) [DP the [CP [NP picture]_j that Bill liked t_j]]

Borsley states that Kayne has an NP-trace in a position where a DP is expected and notes the ungrammaticality of the following example.

(81) *Bill liked picture

Borsley argues that the moved NP in Kayne's model is an argument and only DPs, not NPs can be in an argument position. He then presents a series of examples that provide evidence that the moved relative head in non-*wh*-relatives must be a DP since they behave in the same way as DP traces behave in comparison with *wh*-questions. Firstly, the trace can be coindexed with a pronoun if the pronoun does not c-command that trace. In example (82) and (84) the trace and the pronoun can be coindexed, but not in (83) and (85).

(82) the man that *t* thought he saw a unicorn

(83) the man that he thought *t* saw a unicorn

(84) Who *t* thought he saw a unicorn?

(85) Who did he think *t* saw a unicorn?

Secondly, the trace in a non-*wh*-relative can control a PRO subject, like a DP trace in a *wh*-question can.

(86) the man who *t* tried PRO to fool everyone

(87) Who *t* tried PRO to fool everyone?

Thirdly, the trace of a non-*wh*-relative can license a parasitic gap (*pg*). Again the licensing of a parasitic gap is possible by a DP in a *wh*-question.

(88) the book that Mary criticized *t* without reading *pg*

(89) Which book did Mary criticize *t* without reading *pg*?

Finally, Borsley notes that the trace in a non-*wh*-relative must occupy a Case-marked position in the same way that DP traces do in *wh*-questions, which explains why the following examples are ungrammatical

(90) the man that it was arrested *t*

(91) the man that it seemed *t* to know the answer

(92) Which man was it arrested *t*?

(93) Which man did it seem *t* to know the answer?

All the examples provide above suggest that a non-*wh*-relative is in fact a DP and not an NP as Kayne suggests. If the movement is of a DP and not an NP then example (80) should have a DP in the CP with an empty D.

(94) [DP the [CP [DP [D e] [NP picture]]]j that Bill liked tj]]

Borsley raises two issues in regards to this structure. The first being that a DP with an empty head is somehow allowed in relatives but nowhere else, for example:

(95) *Bill liked [DP [D e] [NP picture]].

(96) *[DP [D e] [NP picture]] annoyed Bill.

The second issue concerning the empty D is that there is nothing to ensure that the empty D remains empty, to prevent examples such as:

(97) *the the picture that Bill liked

Borsley offers no adequate solutions to these issues and concludes that Kayne's analysis of non-*wh*-relatives has many problems.

Moving on from non-*wh*-relatives to *wh*-relatives, Borsley argues that Kayne's approach to these clauses is also flawed. Assuming the same structure for *wh*-relatives as for non-*wh*-relatives, a D with a CP complement, Kayne's approach to *wh*-relatives involves the movement of a DP or a PP to SpecCP and then the movement of an NP to either SpecDP or SpecPP, so that a clause such as:

(98) the picture which Bill liked

would have the structure:

(99) [DP [D the] [CP [DPj [NPi picture]] [DP which ti]] [CP Bill liked tj]]]

and a clause containing a PP such as:

(100) the picture at which Bill gazed

would have the structure:

(101) [DP [D the][CP [PPj [NPi picture][PP at which ti]][CP Bill liked tj]]]

Borsley questions the motivation for the structures in examples (99) and (101), inquiring why the NP should move out of the *wh*-relative that contains it. Kayne has suggested that the NP moves so that it can be governed by the higher D, yet Borsley correctly points out the NP is already governed by a D.

Another problem with Kayne's approach to *wh*-relatives is that the *wh*-phrase and the clause that follow do not form a constituent as they are assumed to do, which could be problematic to clauses such as the following example that contains two conjuncts which, under Kanye's analysis, are not constituents.

(102) the picture *which Bill liked* and *which Mary disliked*

Given the information so far, it seems unlikely that Kayne's raising analysis of relative clauses is on the right track. Borsley has more criticism for the raising analysis of relative clauses, but first, proposals directed toward his concerns about empty D and the structure of *wh*-relatives will be discussed.

4.2.2.3 Rebuttal to Borsley's Criticism – Bianchi (2000)

Replying to Borsley, Bianchi (2000) considers the criticisms by Borsley and offers a refined approach to Kayne's raising analysis. She begins by addressing the issue as to whether the moved constituent is an NP as Kayne suggests or a DP as Borsley has argued. Bianchi also acknowledges that the constituent moves from an argument position and that the consensus is that only a DP can act as an argument. She concludes that the empirical tests of binding, licensing of parasitic gaps, and case marking that Borsley presents to demonstrate that the empty category acts like a DP trace appear to be correct and that the relative had must be a DP. However, the relative D is not filled but empty.

(103) [DP the [CP [DP [D e][NP picture]]]_i[CP that Bill liked t_i]]]

Of course, a DP with an empty D is the conclusion that Borsley comes to in his paper. However, Bianchi goes further and adds that since the external functional D and the

empty relative D are in “a strictly local configuration” a licensing relation can be established (p. 125). The empty D is thereby licensed through a process known as incorporation. Bianchi proposes a “mechanism of deletion by incorporation” whereby the empty relative D can be deleted and incorporated by a host if that host, in this case, the external determiner, has feature structures consistent with its own (p.125).

(104) [DP Drel + the[CP [DP [t][NP picture]]]_i[CP that Bill liked t_i]

Since incorporation is required to license an empty D, Borsley’s example where an empty D is not permitted now receives an explanation.

(105) *Bill liked [DP [D e][NP picture]].

Since there is no host that has feature structure similar to the empty D to incorporate into, the empty D has nothing to license it and therefore examples like (105) are not possible.

For wh-relatives, Bianchi proposes a different analysis than that of Kayne. Instead of working within the constraints of a traditional CP, she makes use of Rizzi’s split CP analysis and assumes a functional category below C¹⁸. So a clause such as:

(106) the picture which Bill liked

would have the following structure:

(107) [DP the [CP [NP picture] [C⁰ [XP [DP which tNP]_i [X⁰ [IP Bill liked t_i]]]]]]

In this analysis, contrary to that of Kayne’s wh-relative analysis, the material following the head is a constituent and therefore satisfies Borsley’s problem where clauses contains two relative clause conjuncts.

Bianchi states that although the external D selects a CP, it also has a selectional N feature which must be checked within its minimal domain. This proposal satisfies the

¹⁸ Bhatt (2002) states that this structure, where XP follows CP appears to be incorrect. If it were correct, languages that allow doubly filled COMPs, such as Norwegian, would exhibit a word order such as *the picture that which Bill liked*. However, this is not the case, and instead, the order encountered is *the picture which that Bill liked*, indicating that any hypothesized extra functional category should be above CP (p. 81).

question posed by Borsley as to why the NP should move out of the *wh*-relative that contains it.

While the initial concerns raised by Borsley concerning the raising analysis seem to have been answered, one problem not encountered yet, remains an obstacle: Case.

4.2.2.4 The Raising Analysis – The Problem of Case

While Bianchi is able to satisfactorily answer many of Borsley's criticisms concerning a raising analysis with relative clauses, the most serious obstacle for any type of raising analysis is the problem of case observed by Borsley in such relative clause constructions. Borsley gives the following example from Polish that contains a *wh*-relative (p. 4).

- (108) Widziałem tego pana, który zbił ci szybę.
saw-1SG the-ACC man-ACC who-NOM broke your-SG glass-ACC
'I saw the man who broke your glass.'

Borsley states that according to Bianchi's (2000) version of the raising analysis, which assumes an added functional category below C, example (108) would have the following representation.

- (109) [DP[D tego][CP [NP_i pana][CP [C e][XP [DP [D który] [NP_i t]][XP [Xe][IP zbil ci szybę]]]]]]

Borsley argues that using Bianchi's construction of *wh*-relatives, it is difficult to explain why the head NP *pana* that has originated as the complement of *wh*-determiner *który* does not have the same nominative case as that determiner. Borsley notes that Bianchi proposes that "being case-marked is a property of the D⁰ position" and "that N⁰ morphologically agrees with the D⁰ by which it is governed (or in whose minimal domain it is included)" (p. 5). Borsley rightfully complains that the governing of *pana* by *tego*, explains why it has accusative case but does not provide any explanation as to why it does not also have nominative case.

Moreover, *wh*-relative clauses are not the only type of relative clauses that present case issues in Bianchi's analysis. Borsley gives another Polish example using a non *wh*-relative.

- (110) Widziałem tego pana, co zbił ci szybę.
 saw-1SG the-ACC man-ACC what broke your-SG glass-ACC
 'I saw the man that broke your glass.'

Here, the structure proposed by Bianchi does not require an added hypothesized phrase level.

- (111) [DP [D tego][CP [DP [D e][NP_i pana]][CP [C co] [TP *t*_i zbił ci szybę]]]]

As before, *pana* is accusative like the determiner that governs it, *tego*. However, it is clear from the structure that the head DP has originated in the subject position of the relative clause. Therefore it should also have nominative case. Bianchi's solution to the problem is to assume that "the structural Case feature of the relative D⁰ has already been checked and erased by the time it reaches [Spec CP]" (p. 6) Borsley states that Bianchi's argument for the erasure of a case feature is problematic since nothing would ensure that a *wh*-determiner undergoing *wh*-movement to Spec CP would carry the proper case, such as the nominative *który* in the following Polish example, again from Borsley.

- (112) Który pan zbił ci szybę?
 Which-NOM man-NOM broke your-SG glass-ACC
 'Which man broke your glass?'

Borsley correctly points out that the real problem of case is not with the determiner but with the NP. The case features on the NP are not checked but rather occur only through agreement with the determiner. Even if the checked case feature were somehow erased from the determiner, the NP would still agree with the determiner in the position which it was first governed.

The evidence above indicates that the raising analysis in its current form presents serious issues for realizing the case features of the raised determiner and agreement of the raised NP.

4.2.3 The Matching Analysis

Another solution that can account for reconstruction effects encountered in relative clause constructions is the matching analysis. Originally, the matching analysis assumed that an empty operator within the CP moves from the argument position to Spec CP where it can then match with the external noun. The matching analysis resembles the head external analysis in that the external head does not originate inside the relative clause CP.

(113) [DP [D the][NP [N book]_m[CP [Op_i]_m][TP Mary read *t_i*]]]]

However, in his paper “Unpronounced Heads in Relative Clauses”, Sauerland (2003) argues that empty operator movement of the original matching theory cannot be the correct derivation for relative clauses. Based on evidence from quantifier binding and a construction he labels Doubly Headed Antecedent Contained Deletion, (or Doubly Headed ACD), Sauerland demonstrates that there is an identity relationship between the external head and the internal operator in relative clauses.

Sauerland first observes that there is an identity relationship between the external head and the internal operator in relative clauses and this relationship is demonstrated in the binding relationships between quantifiers and pronouns. Sauerland cites Safir (1998) who notes that “a quantifier in the head of the relative can only bind a relative clause internal pronoun if the pronoun is c-commanded by the RC-internal trace” (Sauerland, 2003, p.9-10)

(114) a. *Mary exhibited the picture of every boy that he/his sister bought
b. Mary exhibited the picture of every boy that was bought by him/his sister

Recall that the original matching analysis has an empty operator within the CP move from the argument position to Spec CP where it can then match with the external noun. . If the relative clause internal position were only an empty operator, then the status of (114)a and b should be the same. However, their difference suggests that at least some material of the relative clause head is represented in the clause internal trace position.

A second argument in favor of material in the internal trace position comes from ACD constructions. ACD is a type of VP ellipsis inside a relative clause where the relative clause head appears to be part of the antecedent VP. So, in example (115), the antecedent of the elided VP contains the elided VP.

(115) John visited every town that Mary did {visit *t*}

Sauerland states that arguments from Sag (1976), Larson and May (1990) and Kennedy (1997a), suggest that ACD constructions involve quantifier raising of a DP containing the relative clause. In the example above, the DP head of the ACD-relative is also the DP that undergoes quantifier raising, as demonstrated in the following LF representation of the previous example.

[every town, *OP*_{*y*} Mary visited [*y*]]λ_{*x*} John visited [*x*]

However, there are constructions where the two DPs are different. Sauerland calls examples like this Doubly Headed ACD. Often, Doubly Headed ACD is ungrammatical as in example (116)a, while with certain constructions, such as (116)b, Doubly Headed ACD is grammatical.

(116) a. *Polly visited every town that's near the lake Eric did {visit *t* }
b. Polly visited every town that's near the town Eric did {visit *t* }

Sauerland states that the difference between the two examples is that in the ungrammatical example, the head noun of the relative clause and the noun in the DP that undergoes quantifier raising are different while in the grammatical example, both nouns are identical. He argues that the identity requirement of ellipsis allows ellipsis if and only if the trace that is internal to the relative clause and the trace that is left by quantifier raising is identical.

From the evidence above, Sauerland concludes that the internal operator cannot be empty but must be identical or, as he states, “nearly identical” to the external head. In Sauerland’s reformulated matching analysis, the external head has a corresponding internal head which is then phonologically deleted under identity with the external head. Crucially, the internal head and external head are not part of a movement chain and therefore both must be interpreted.

(117) [DP [D the][NP [N book]_m[CP [which ~~book~~_m]_i[TP Mary read *t_i*]]]]]

4.2.3.1 The Modified Matching Approach – Koster-Moeller (2012)

In both the raising analysis presented by Kanye and the matching analysis presented by Sauerland, the constituent that undergoes movement in a relative clause is an NP. And while Bianchi's approach has a DP undergoing the movement, the head is of the DP is an empty D that is licensed by incorporation of the higher functional D. In contrast to these approaches, Koster-Moeller (2012) argues that the internal heads act syntactically and semantically as if they were full DPs.

Koster-Moeller acknowledges Borsley's (1997) work showing that relative clause head behave like DPs. However, she states that Borsley does not demonstrate that NPs cannot behave in the same way. Providing this information would presumably strengthen the argument that the relative clause heads are indeed DPs and not NPs as others have assumed.

Koster-Moeller first presents evidence that a DP can license extraction out of weak islands while an NP cannot: Using German, which allows topicalization of both full DP and bare NPs, she shows that this topicalization is subject to certain island constraints, such as extraction out of a negated factive infinitival complement clause. *Wh*-phrases and DPs can undergo topicalization from this type of weak island while NPs cannot. The data is from Koster Moeller, which shows *wh*-movement, DP movement and NP movement, respectively (p. 212).

(118) Was₁ hat er (nicht) bedauert [*t₁* verkaufen zu muessen]?

What₁ has he (not) regretted [*t₁* sell to must]?

'What did he (not) regret having to sell?'

(119) (Nur) ein Haus₁ hat er (nicht) bedauert [*t₁* verkaufen zu muessen]

(only) one house₁ has he (not) regretted [*t₁* sell to must]

'Only one house is such that he has (not) regretted having to sell it.'

(120) *Haus₁ hat er (nicht) bedauert eines [*t₁* verkaufen zu muessen]

house₁ has he (not) regretted one [*t₁* sell to must]

'house is such that he has (not) regretted having to sell one'

If relative clause heads were NPs they should not be able to extract out of weak islands. However, relative clause heads can extract out of weak islands, which strongly suggest that they are DPs and not NPs.

- (121) a. The book that we regretted [that John read t_1]
 b. The book that we wondered [how to read t_1]

Koster-Moeller then shows that a DP can license parasitic gapping while an NP cannot. Again, the following is her data, now from page 214, with a topicalized DP and then an NP.

- (122) Dieses Formular₁ hat er ohne durchzulesen ___ t_1 ausgefüllt ...
 that form₁ has he without read through ___ t_1 filled out ...
 ‘that form he has filled out without reading...’

- (123) *Formular₂ hat er keines t_{12} ohne durchzulesen ___ t_1 ausgefüllt ...
 form₂ has he none t_{12} without to read through ___ t_1 filled out...
 ‘a form he has not filled out without reading...’

Relative clause heads can license parasitic gaps, which Koster-Moeller notes should not be possible if they are considered NPs.

- (124) the book that Mary criticized t without reading pg

Koster-Moeller states that not only do relative clause heads act syntactically like DPs but they also act semantically like DPs, since relative clauses heads have “robust scopal force, which DPs, but not NPs have...” (p.220). She demonstrates this fact by comparing standard relative clauses with relative clauses that contain an ACD site. While standard relative clauses, like example (125), allow a surface scope reading and also an inverse scope reading where the DP and its clause takes scope over the matrix subject, relative clauses that contain an ACD site, like example (126) are restricted to only the surface scope reading. The following data is from Koster-Moeller, her (22) and (23) (p. 215-216).

- (125) a. A professor read every book that Mary wrote.
 Surface: A single professor read every book that Mary wrote.

Inverse: Every book that Mary wrote is such that some (different) professor read it

b. A professor read every book that a student wrote.

Surface: A single professor read every book that a student wrote

Inverse: Every book that a student wrote is such that some professor read it

- (126) a. A professor read every book that Mary did. *Inverse Scope ($\forall > \exists$)
b. A professor read every book that a student did. Inverse Scope ($\forall > \exists$)

Koster-Moeller does note, however that (126)b allows the inverse scope reading. She states that since the relative clause subject in this example is indefinite, inverse scope is possible because the DP and the relative clause subject are “scopally non-commutative” (p. 216). Koster-Moeller hypothesizes that if the host DP and the relative clause subject are scopally commutative, then inverse scope should not be available. This hypothesis is confirmed with the following example in which *every book* and *every boy* are scopally commutative.

- (127) a. A girl read every book that every boy did. *Inverse Scope ($\forall > \exists$)
b. A girl read every book that a boy did. Inverse Scope ($\forall > \exists$)

The data presented by Koster-Moeller demonstrates that the relative clause determiner is interacting scopally with the relative clause-internal operators. Ruling out that the interaction is a genuine semantic interaction, she concludes that the internal relative clause head must have systematic scopal force, which is a property shared with quantificational DPs, not NPs. She further concludes that “the internal head seems to be identical to the external DP head of the relative clause” (p. 217).

In order to properly account for the data of relative clauses that contain an ACD site, Koster-Moeller presents an ellipsis licensing algorithm which “relies on a focus semantic notion of contrast rather than simple identity between ellipsis and antecedent constituent” (p. 217). While the specific calculations of the algorithm are beyond the scope of this thesis, Koster-Moeller extends the theory to relative clauses containing ACD sites, noting crucially, that for the algorithm to function, two constituents – one being the matrix clause with the host DP, and the other being the full relative clause with a copy of the host DP – must be accessible at some point in the derivation. The

relevant conclusion is that the determiner of the host DP needs to be active in both the ellipsis constituent and the antecedent constituent. Koster-Moeller concedes that this creates a problem since a final relative clause structure would only have one DP available while the algorithm requires access to two full DPs.

Therefore, in order to accommodate the internal copy of the DP head in a way that allows it to affect ellipsis licensing requires a modified matching analysis, Koster-Moeller proposes a modified matching analysis in which there are two (fully separate) copies of the relative clause head DP.

(128) [DP every [NP book [~~every book~~ that mary read t₁]]]

The significant difference between the modified matching analysis and the matching analysis under Sauerland is that the moved item is a full DP. The DP raises to SpecCP and then undergoes deletion under identity as the relative clause is merged with the external copy of the host DP.

Koster-Moeller provides empirical support for the modified matching analysis and concludes that modified matching where a full DP undergoes movement is a more acceptable choice for relative clause formation.

However, any matching analysis, whether traditional or modified, remains questionable since it requires a procedure whose implementation is unclear and unsubstantiated. Neither Koster-Moeller nor Sauerland provide an explanation as to why the internal head should raise to the CP or why that particular head should be the one that deletes under identity. Bianchi does provide a rationale for the raising of the internal head - the external D has a selectional N feature which must be checked within its minimal domain. However, Bianchi is using a raising analysis, which itself has serious issues regarding the assignment of case. It seems therefore, that for an account of relative clause construction to address all the issues raised so far, a new analysis is required.

5 The Proposal – The Bisecting CP Hypothesis

From the information presented so far, it is clear that current theories concerning relative clauses have some issues that remain unresolved. Response to some of the issues has been to modify the existing models of raising and matching. Some linguists have suggested an additional functional category above or below the CP to explain the raising analysis of relative clauses. In Borsley's paper, Ian Roberts suggests a category between DP and CP (footnote 7, p. 639).

(129) [DP the [XP[picture]_i [CP [which t_j]_j [DP Bill liked t_j]]]]

And as noted earlier, Bianchi (2000) places a functional category between CP and IP and creates the following (p. 130):

(130) [DP the [CP [NP picture] [C0 [XP [DP which tNP]_i [X0 [IP Bill liked t_i]]]]]]

Gallego (2004) labels an additional functional category little "c" "in order to capture the fact that it is reasonably analogous (though not identical) to v* within the VP-system, in the sense that it introduces a 'subject of predication'," (p. 11)

(131) [cP man_j [c' c[uφ, EPP] [CP [who t_j]_i [iRel] [uT] [C' C[uT, EPP] [uRel, EPP] [TP t_i left t_i]]]]]

While the addition of an extra category to the raising analysis allows for the relative clause to form a constituent that excludes the relative head, it does not provide a sufficient rebuttal to Borsley's criticism concerning case. Koster-Moeller's modification to the matching analysis recognizes that a full DP, and not just an NP, must undergo movement to satisfy specific requirements of relative clause interpretation, but provides no reason as to why the full DP should move to the CP. It seems then that modification of either analysis perhaps may not be the right course to follow.

However, postulating a new analysis for restrictive relative clauses relegates the progress that both the matching and raising analyses have added to the understanding of these clauses. Since both the raising and matching analyses operate within the domain of the CP layer, a fundamental change to the function of CP layer may be a possible

solution to the pending issues. To understand how a change to the CP layer may be able to solve the issues found in relative clause analyses, the function of the CP needs to be reexamined.

From Rizzi:

“We can think of the complementizer system as the interface between a propositional content (expressed by the IP) and the superordinate structure (a higher clause or, possibly, the articulation of discourse, if we consider a root clause). As such, we expect the C system to express at least two kinds of information, one facing the outside and the other facing the inside.

Consider first the information looking at the higher structure. “Complementizers express the fact that a sentence is a question, a declarative, an exclamative, a relative, a comparative, an adverbial of a certain kind, etc., and can be selected as such by a higher selector”.

The second kind of information expressed by the C system faces the inside, the content of the IP embedded under it. It is a traditional observation that the choice of the complementizer reflects certain properties of the verbal system of the clause, an observation formalized, e.g., by “agreement” rules between C and I, responsible for the co-occurrence of that and a tensed verb, of for and an infinitive in English (Chomsky and Lasnik 1977), etc.”

If the CP system must perform two separate functions – one, supplying information to the superordinate, and one supplying information to the subordinate – then it is a plausible suggestion (as it was for the Split CP Hypothesis) that the functions are performed by two separate items, that each has a syntactic connection to the clauses to which they supply the information.

Interrogative and declarative expressions are clearly a requirement of matrix clauses. However, the force distinction is less important with subordinate clauses since even with embedded interrogatives, there is no T to C movement. Subordinate clauses introduced by *if* or *whether* are indeed question-like elements. However, the real distinction within the CP is that of the expression of internal quantification and

finiteness that is related to the subordinate clause versus the focus/related external arguments that is optionally required by the matrix clause.

Therefore, I propose a change to the CP system, henceforth known as the Bisecting CP Hypothesis, where the properties of the part of the CP that looks upward at the superordinate structure is conditioned by whether the phrase within the CP satisfies subcategorizing argument requirements of the matrix verb. The requirement for the part of the CP that looks downward at the subordinate structure remains the same as in a traditional CP – internal quantification, finiteness and agreement.

Central to the Bisecting CP Hypothesis is the subcategorizing properties of the matrix verb that determines if a traditional (or un-bisected) CP can satisfy the selectional requirements for the subordinate and superordinate clauses or if the CP undergoes division to satisfy those requirements. For example, due to subcategorization, a verb like *think* can take a declarative finite clausal complement.

- (132) John thought [Mary kissed the man]
- (133) *John thought [the man]
- (134) *John thought [the [man [who Mary kissed]]]
- (135) *John thought [who Mary kissed]

As the examples above demonstrate, the verb *thought* may only subcategorize for a proposition such as a finite clausal complement rather than an individual argument, meaning that it cannot subcategorize for an argument that would be external to an embedded clause. The verb also cannot subcategorize for an indirect question. Since the verb subcategorizes for a clausal complement, a traditional single CP filled with the declarative finite complementizer *that* suffices in providing all the necessary information required.

When a different verb is used, the situation inside the CP changes. For example, a verb like *remembered* can also subcategorize for a clausal complement.

- (136) John remembered [CP [TP Mary kissed the man]]

And *remembered* can also subcategorize for an indirect question. The derivation would begin with two separate clauses.

- (137) John remembered
[CP [TP Mary kissed who]]

However, before the verb selects the clause, the *wh*-phrase must undergo *wh*-movement to gain its scope position inside the CP.

- (138) [CP who [TP Mary kissed *t*]]

After the indirect question clause has formed, the clause can then be selected by the verb *remembered*.

- (139) John remembered [CP who [TP Mary kissed *t*]]

The verb *remembered* can also subcategorize for a DP complement and therefore a headed relative clause complement.

- (140) John remembered [the man]

- (141) John remembered [the man who Mary kissed]

To account for the ability of the verb *remember* to subcategorize for different complement types, the verb must be capable of expressing different subcategorization properties, depending upon usage. To be able to subcategorize for a DP the verb is said to have an uninterpretable nominal feature [uN] which must be checked (or deleted).

In relative clauses, the DP that satisfies the subcategorization of the verb has a relation to the relative clause internal DP in both the raising and matching analyses. Both analyses agree that the internal relative clause head (a DP or NP) undergoes movement to the CP similar to *wh*-movement to fulfil that relationship. Yet, recall that they do not agree on how it can receive its case and theta role assignments that are different from the position in which the head began (and different from that of *wh*-movement). While the raising analysis basically ignores the problem of case or offers little to rectify the situation, the matching analysis allows for two separate heads, one internal and one external, to satisfy the case and theta role requirements of the superordinate and subordinate verbs. However, the matching analysis also has its problems. One problem is that it does not provide any motivation as to why the relative clause internal head should move to the CP. The motivation cannot be to check a nominal feature on the

matrix verb since the clause in a matching analysis has that position already filled before movement. Another problem is that of binding. If a pronoun in a relative clause head can be bound by an operator inside the relative clause than the matching analysis cannot be the right analysis since the external head will never be c-commanded by the binder. (Koster-Moeller, 2012).

A Bisecting CP Hypothesis offers a solution to the problem of case and theta role assignment in relative clause constructions as well as an alternative solution to the stipulation of matching, if matrix verb subcategorizing properties are properly taken into account. As stated earlier, embedded clauses involving the complementizer *that* require only a traditional, un-bisected CP. However, when the matrix verb selects for a D, that D can then choose either to take an NP or a CP as its complement. If the D chooses a CP complement, the D creates an environment for movement of the internal relative head into the CP since it has a selectional N feature which must be checked within its minimal domain. This movement of the internal relative head creates an argument that must be both internal and external to the CP and so the requirements within the CP become bisected. It is important to note here that the DP that undergoes movement is a full DP as assumed in the modified matching analysis of Koster-Moeller (2012), contrary to the NP movement of Kayne and the empty D of Bianchi's (2000) DP. Take the following example.

(142) John remembered the man who Mary kissed

Under the Bisecting CP Hypothesis, the relative clause construction would begin with (a) a matrix verb, here *remember*, which selects a D complement and (b) a subordinate clause in which the C contains an operator feature, turning the clause into a property of the kind expressed by the operator focus.

(143) a. John [V remember] => D
 b. [CP [C +Op] [TP Mary kissed the man]]

The D then selects the CP for its complement.

(144) John remembered [DP [D] [CP [C +Op] [TP Mary kissed the man]]
Functional D Selects CP Complement

As Bianchi (2000) suggests, the functional D has a selectional N feature which must be checked within its minimal domain. This is the motivation for movement of the internal relative head into the CP, checking the operator feature.

(145) John remembered [DP [D] [CP the man [C +Op] [TP Mary kissed *t*]] *A'*
movement

The added argument created by the external D has its own specific case and thematic requirements, which are separate from those of the item undergoing A' movement. Due to the requirements of both internal and external arguments, the CP must bisect into separate projections to satisfy the requirements of both the subordinate and superordinate clauses. Here we can invoke processes from biology that provide a metaphorical interpretation to bisecting the CP – kinesis, mitosis and cytokinesis. Kinesis is defined as movement in response to an external stimulus. Within the syntax of relative clause construction, the external D (the result of verb subcategorization) acts as a stimulus upon the CP, in this case, inducing syntactic bisection. In mitosis, a cell creates an exact duplicate of its chromosomal content. Before bisection of the CP, the information inside the CP creates a lexical copy of itself; essentially this is identical to what, up until now, has been called the matching process. In cytokinesis, the cell bisects, creating two cells with the same chromosomal information. In keeping with the metaphor, the CP then bisects into separate projections; each filled with lexically matched information, in this case a DP.

(146) John remembered [DP [D] [CP the man [CP the man [C +Op] [TP Mary
kissed *t*]]] *CP Bisection*

The lower copy of the bisected CP then deletes under identity with the higher copy.

(147) John remembered [DP [D] [CP the man [CP ~~the man~~ [C +Op] [TP Mary
kissed *t*]]] *Relative Deletion*

At this point in the derivation, the idea of incorporation is borrowed from Bianchi (2000), where the empty D of the matched DP is licensed by the external functional D. However, in the Bisecting CP Hypothesis, the determiner *the* in the DP *the man* incorporates upwards out of the CP into the functional D, lexicalizing the head D. The

purpose of incorporation is so that the D can receive case from the matrix verb and therefore the NP inside the CP would be also accessible for case assignment.

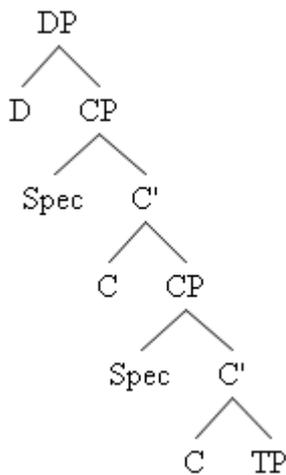
- (148) John remembered [DP [D the] [CP ~~the man~~ [CP ~~the man~~ [C +Op] [TP Mary kissed *t*]]] *D Incorporation*

Although the lower copy has deleted under identity with the higher copy, the operator feature remains checked in the lower CP as it is in *wh*-movement. English has a tendency to overtly mark an operator so the operator feature may spell-out with an appropriate of *wh*-pronoun, relative *that* or remain empty, depending on specific requirements. What specific requirements determine whether any relativizer receives spell-out is an issue that I will not attempt to answer in this thesis. In any case, the operator retains the case and thematic roles of the DP received from the subordinate verb which are realized by spell-out of an appropriate relative pronoun.

- (149) John remembered [DP [D the] [CP man [CP who [TP Mary kissed *t*]]] *Relative Pronoun Spell-out*

For restrictive relative clauses, the above manifestation of a bisecting CP is proposed. Due to the nominal subcategorizing external argument requirements of the matrix verb, the higher CP is a complement to a functional D and then joined to a lower CP. The fully manifested bisected CP model would be:

- (150)



In his raising analysis, Kayne (1994) states that the head nominal is selected by a functional D as its complement, so the idea that a CP can be a complement of a determiner is not an innovation to the field. This follows along the same line as Longobardi (1994), who argues that argument phrases are always introduced by a D. (see also Adger and Quer (2001) for unselected embedded questions introduced by a functional D and Abney (1987) for gerundive constructions).

The Bisecting CP analysis therefore represents a novel way to unify the current raising and matching analyses, drawing on a suggestive parallel in cell biology. By allowing a process of bisection to the traditional CP category that is present in both the raising and matching analyses, this new hypothesis allows for reconstruction of the internal relative clause head in a manner as acceptable as the raising analysis, and better than the matching analysis, since it allows a pronoun in the higher relative clause head to be bound by an operator inside the relative clause. Moreover, it allows for a full DP internal head where the D can be incorporated into the external functional D to provide assignment of case to which the NP can agree. Also, like the raising analysis, the nominal selectional properties of external D also provides the motivation for the movement of the relative clause internal head. However, unlike the raising analysis, the Bisecting CP Hypothesis allows for a relative clause to form a constituent that excludes the head relative without postulating an additional unknown category and most importantly, allows for the external and internal relative heads to receive separate case and theta assignments. Finally, the Bisecting CP Hypothesis allows a point in the derivation in which there are two (fully separate) copies of the relative clause head DP for the Koster-Moeller's ellipsis licensing algorithm.

5.1 The Bisecting CP Hypothesis and Projecting Movement

The bisecting CP hypothesis also provides a solution to another problem of Kayne's raising analysis that has up to this point, not been discussed. Bhatt (2002) cites Chomsky (1995, sec. 4.4.2., 1998, sec. 5, p. 51) who argues that in cases of movement, it is always the target that projects (p.76) However, Bhatt observes that "when the head NP moves out of the relative clause CP, it is an instance of a projecting movement, that

is, an instance of movement where the moving phrase and not the target projects” (p. 76). He notes that no other types of movement, such as raising, head raising and *wh*-movement, are cases of projecting movement but rather it is the target of these movements that project.

Bhatt presents some solutions to address what he calls “the problem of projection”. Firstly, he suggests that relative clause movement is different than other movement since it involves an NP and not a DP – it is DPs, and not NPs that receive case and theta roles – and therefore it is plausible to suggest that they have different properties regarding movement (see Bhatt 2002, footnote 20, p.76). However, given the evidence from Koster-Moeller that relative clause movement involves a full DP rather than an NP, this suggestion does not seem to be on the right track. Bhatt also proposes that projecting movement should not be completely ruled out in syntax, based on his analysis of reduced relative clauses which he says constitutes an environment where there is projecting movement. Although his analysis of reduced relatives lends credibility to his idea that some structures may allow projecting movement, it is Bhatt’s third suggestion – that there is no need for hypothesizing projecting movement in the first place – that is most relevant to the discussion. Acknowledging that a problem with Kayne’s raising analysis was that it did not allow for the relative clause to form a constituent that excludes the relative head, Bhatt references Bianchi’s alternative phrase structure (see example (107) and footnote 18 in this thesis) as a way not only to satisfy the problem of constituent formation, but also as a construction that eliminates the need for projecting movement.

However, the raising analysis, regardless of any change to its structure, cannot properly account for case and theta role assignment in relative clause construction. Contrary to any raising analysis presented, the Bisecting CP Hypothesis properly accounts for case and theta assignments and allows for a relative clause constituent formation that excludes the relative head, while also eliminating the need for projecting movement, without additional categories.

5.2 The Bisecting CP Hypothesis and Pied-Piping

The Bisecting CP Hypothesis is also a plausible solution to restrictive relative clauses where a preposition has been piped-piped along with a DP complement into the CP.

(151) John knew the man with whom Mary danced

As before, the relative clause construction begins with (a) a matrix verb, here *knew*, which selects a D complement, and (b) a subordinate clause in which the C contains an operator feature.

(152) a. John [V knew] => D
b. [CP [C +Op] [TP Mary danced with the man]]

Again, as before, the functional D then selects the CP as its complement.

(153) John knew [DP [D] [CP [C +Op] [TP Mary danced with the man]]]
Functional D Selects CP Complement

However, in this example, the preposition is pied-piped along with the DP into the CP.

(154) John knew [DP [D] [CP with the man [C +Op] [TP Mary danced t]]] A'
Movement with Pied-piped P

Once again, there is an added argument created by the external D, so the CP must bisect. However, the information that is copied when the CP bisects also contains the pied-piped preposition.

(155) John knew [DP [D] [CP with the man [CP with the man [C +Op] [TP Mary danced t]]] CP Bisection

The lower copy of the DP deletes under identity. However, since a preposition cannot be a complement of the external D, the preposition in the higher CP cannot receive spellout. The preposition undergoes deletion in the higher CP and is instead spelled out in the lower CP, a process similar to discontinuous spellout¹⁹ but what I will term here discontinuous deletion.

¹⁹ Discontinuous Spellout is a phenomenon where part of a moved phrase is spelled out in the position from which it was moved, rather than the moved position.

- (156) John knew [DP [D] [CP ~~with~~ the man [CP with ~~the man~~ [C +Op] [TP Mary danced t]]] *Discontinuous Deletion Under Identity*

I would note here that deletion under identity of the internal head in relative clauses is obligatory, unlike deletion in a process such as VP ellipsis. Sauerland (2003) calls this type of deletion Relative Deletion, a process similar to obligatory Comparative Deletion²⁰. Normally, the preposition in the upper CP could be argued to inhibit upward incorporation of the internal D with the external D. However, since deletion in relative clauses is obligatory and there is no operator/trace dependency created by the deletion of the upper preposition, there is no reason but to consider this process actual deletion of the preposition, which therefore allows incorporation of the D²¹.

- (157) John knew [DP [D the] [CP ~~the~~ man [CP with ~~the man~~ [C +Op] [TP Mary kissed t]]] *D Incorporation*

The D in the DP *the man* incorporates upward out of the CP into the functional D, lexicalizing the head D. The lower copy of *the man* deletes under identity with the higher copy, however the P *with* remains in the lower CP. It is a general observation that a preposition cannot be stranded in a non-argument position without an overt complement, so the checked *Op* feature takes an appropriate *wh*-pronoun, fulfilling the complement requirement.

- (158) John knew [DP [D the] [CP ~~the~~ man [CP with whom [TP Mary danced t]]] *Relative Pronoun Spellout*

5.3 The Bisecting CP Hypothesis and Interrogative Force

Returning to van Craenenbroeck's analysis of ForceP and FocusP in a split CP that satisfactorily addressed Newmeyer's issues with a split CP, the issue of where the site is

²⁰ Comparative deletion is an obligatory ellipsis mechanism that occurs in the *than*-clause of a comparative construction. So, a sentence involving comparative deletion such "Mary reads more books than John reads ___" would be ungrammatical if the ellipsis does not occur - * "Mary reads more books than John reads books".

²¹ It has been pointed out to me by Whelpton (personal communication) that allowing the preposition to simply delete appears to be ad-hoc. Another possibility may be that bisection only copies the nominal material, since the functional D is only targeting that material. That would leave the P in the lower CP and allow the internal D to incorporate unhindered.

for relative *wh*-operators has now been answered with the bisecting CP model. Recall that van Craenenbroeck suggests his split CP analysis can fulfill the operator requirement of simple *wh*-phrases by having it first checked in the lower CP as the *wh*-phrase moves through it and then have the illocutionary force checked as the *wh*-phrase moves to the higher CP. Relative *wh*-operators do not need to give illocutionary force; i.e. they are not interpreted as questions. In the Bisecting CP Hypothesis, the relative pronoun, if it occurs, is always spelled-out in the lower CP due to a checked operator feature and then remains there, as van Craenenbroeck claims it does in some Doubly Filled Comp examples in Frisian.²² If any interrogative force is associated with a relative pronoun (and I doubt there is), it would be superseded by the declarative force of the higher bisected CP. However, the landing site for simple *wh*-phrases in embedded indirect questions needs also to be clarified.

I suggested earlier, in relation to van Gelderen's paper, that embedded indirect questions formed with simple *wh*-phrases could be syntactically relative clauses. However, upon closer scrutiny, this seems not to be the case. Consider the following:

(159) John knows *who* kissed Mary

(160) John knows the person *who* kissed Mary

While this example and those presented earlier suggest a syntactic similarity, the semantics of an indirect question clause does not give an exact equative reading as a relative clause. Example (159) means that John knows the propositional content of the embedded clause. That is to say, John knows that it was *x* that kissed Mary, but John may not necessarily know the person *x* himself. However, example (160) does mean that John knows the person, but it does not necessarily entail that John knows that that person has kissed Mary. The relative clause may simply be providing information from the speaker to the hearer about the person.

²² Newmeyer (2004, p. 411), Sobin (2003, p. 515) and van Gelderen (2004, p. 5) all observe that in Middle English, *wh*-phrases come before "that". However, in the examples that they cite, the *wh*-phrase in question is arguably a free or headless relative. But its very definition, there would be no DP(head) in the SpecCP position to prevent a *wh*-relative pronoun from first checking the operator feature in the lower CP and then moving up to type illocutionary force in the higher CP as van Craenenbroeck hypothesizes. Of course, in the Bisecting CP model, "that" is assumed to be in the lower CP which could theoretically allow for such situations.

Given this fact, simple *wh*-phrases must have a different CP structure than that of relative clauses and be more like *that* clausal complements where there is an un-bisected CP. Unlike *wh*-pronouns in relative clauses which are in fact a spell-out at PF of deleted material in SpecCP, *wh*-phrases that form indirect question clauses must undergo *wh*-movement from their base-generated position inside the subordinate clause to gain their position in the CP. As the matrix clause in indirect question clauses is subcategorizing only for a clausal complement and not for a DP complement, there is no need for a functional external D. The CP is not bisected and so there is no higher CP superseding the CP containing the *wh*-phrase. This fact allows the interrogative force of the *wh*-phrase to be realized.

However, this conclusion is no closer to providing a reason for the phenomenon, noted earlier in this paper by van Craenenbroeck, to why complex *wh*-phrases appear to have more acceptability than simple *wh*-phrases in certain constructions. The example from van Craenenbroeck that contains two *wh*-phrases is repeated here:

- (161) a. * What did who buy?
 b. ?What did which boy buy?

Perhaps the perceived improved grammatical acceptability of complex *wh*-phrases over simple *wh*-phrase in constructions where there are two *wh*-phrases is a phenomenon distinct to English. Icelandic speakers find the following constructions using both simple and complex *wh*-phrases ungrammatical. In fact, some Icelandic speakers find the example with the simple *wh*-phrase more acceptable than the one with the complex *wh*-phrase, a situation reversed from that of English examples.

- (162) *Hvað keypti hver?
 What bought who?
 ‘What did who buy?’
- (163) *Hvað keypti hvaða strákur?
 What bought which boy?
 ‘What did which boy buy?’

While the grammaticality of clauses that contain two *wh*-phrases remains a debate, there remains an acknowledged difference between simple and complex *wh*-phrases. The

difference between the two seems to be, as Pesetsky (1987) claims, discourse related, as the following examples demonstrate.

(164) Question: Who did you see?

Answer: a. I saw John

b. I saw Bill

c. I saw Bill and John

d. I saw Mary

e. I saw everyone

f. I saw no one

(165) Question: Which boy did you see?

Answer: a. I saw John

b. I saw Bill

c. *I saw Bill and John

d. *I saw Mary

e. *I saw everyone

f. *I saw no one

The first question asks the speaker to identify anyone, known or unknown. The second question asks the speaker to identify a single individual out of a group of young male individuals who are probably known by both the person asking the question and the person asked to respond. So the second question is discourse linked (D-linked).

Pesetsky adds that if the hearer were “ignorant of the context assumed by the speaker”, a question like (165) would sound “odd” (p 108). Moreover, the question containing the complex *wh*-phrase seems to be more referential, since it only permits an answer that is one boy. The answer cannot be two boys; a girl; everyone or no one.

So, there is a semantic difference between simple and complex *wh*-phrases. Van Craenenbroeck obviously knows this, but he is focused on a syntactic difference rather than a semantic one, hence the use of a split CP. However, while his proposed split CP

may not capture the differences entirely, the concept of a syntactic difference should not be completely dispensed with along with the structure.

Pesetsky argues that a D-linked *wh*-phrase does not have to move at LF, it can receive its scope in-situ by Baker-style Q binding from the CP. Reinhart (1992, 1998) makes a similar claim. This proposition is unusual since *wh*-phrases are considered to be quantifiers and quantifiers, according to Chomsky (1976), must occupy an A' position at LF. Pesetsky's way around this requirement is to assume that D-linked phrases are not quantifiers, which becomes a central point to van Craenenbroeck's argument that *wh*-phrases are not syntactic operators. Reinhart's research supports this view, treating *which* as a weak determiner, therefore defective as an operator. She suggests that *which* taken together with a set introduced as the translation of its complement N, forms a choice function variable. The *which*-phrase can remain in-situ and be bound by Baker's Q morpheme since *which*'s quantification is over the N-set. For simple *wh*-phrases, there is no N-set and so they must move to the CP to realize their quantificational force.

Pesetsky acknowledges that if D-linked *wh*-phrases do not have to undergo movement, then the requirement that they move in English needs to be addressed. He proposes that since nothing should prevent them from moving, there may be a property in the CP that forces them to move to satisfy some requirement of the CP. He suggests the Q morpheme in the CP may have to cliticize to a *wh*-phrase unless the CP already contains a *wh*-phrase. This could explain the difference between simple and complex *wh*-adjuncts.

- (166) a. *Who fainted when you behaved how?
 b. Who fainted when you behaved which way?

Recall that van Craenenbroeck observes that simple *wh*-adjunct cannot be left in-situ inside a *wh*-island; it needs to move from its position in LF to its scope taking position at S structure fulfilling their role as syntactic operators. Complex *wh*-phrases, on the other hand can remain in-situ throughout the derivation.

Although the Bisecting CP Hypothesis offers no answers to the differences between simple and complex *wh*-phrases observed by van Craenenbroeck, D-linking provides an explanation to the asymmetry, suggesting that perhaps there is no need for a syntactic

analysis. However, there is another type of *wh*-phrase construction in which a syntactic difference may be discovered.

5.4 Wh-X/That and Relative Clause Constructions

One well documented asymmetry between simple *wh*-phrases and complex *wh*-phrases is the *wh*-/that construction in various languages and dialects. Complex *wh*-phrases are sometimes observed with relative/complementizer *that*.

- | | | |
|-------|--|------------------|
| (167) | I woass it wieviel dass er für des Auto zahlt hät
I know not how.much that he for the car paid has
'I don't know how much he paid for the car' | Alemannic |
| (168) | Vi vet hvis hest som vant løpet
We know whose horse that won race.the
'We know whose horse won the race' | Norwegian |
| (169) | I wonder which dish that Mary bought | Belfast English |
| (170) | You could come and see which one that you're
interested in ²³ | American English |

In contrast, clauses with simple *wh*-/that constructions are generally considered to be ungrammatical.

- | | | |
|-------|---|-----------|
| (171) | *I wett gern wise, wa das I do uusfülle muss
I would gladly know what that I there out.fill must
'I would like to know what I have to fill out there' | Alemannic |
| (172) | * I wonder what that Mary bought | |

The observation of complex *wh*-/that constructions has often been accounted for as a Double Filled COMP violation. However, there is another way to analyze such constructions. Taking the information above concerning D-linked *wh*-phrases and combining it with the Bisected CP Hypothesis, the relative-like construction of *which/that* clauses can be explained. Consider the example above from Belfast English.

²³ This example is one out of around 80 Double Filled COMP examples that appears on the website of Beatrice Santorini, Senior Fellow at the University of Pennsylvania.

The verb *wonder* is known to subcategorize for interrogative complements. However, contrary to popular consensus, *wonder* can also subcategorize for declarative complements.

(173) Mazarini wondered that the cardinal did not hear the thunder of his heart

(174) I wonder that you would sell yourself so cheap

(175) It appeared so long, since I had been a schoolboy there, that I wondered the place was so little changed – in David Copperfield by Dickens

And *wonder* can also subcategorize for a DP complement.

(176) As a child, I wondered many things.

Therefore, *wonder* can also subcategorize for relative or relative-like clauses.

(177) He wondered the places he might go, the things he might see, might hear

(178) I wonder the frustration that our people feel...

(179) People wonder the impact that had on you...

With these facts in mind consider again the example from Belfast English through the process of a bisecting CP and a *which*-phrase that is D-linked. Since the verb *wonder* can subcategorize for both indirect questions and DPs, I argue that in the cases where *wh-x/that* constructions exist, it is a case where the matrix verb has selected for a D complement and the subordinate clause contains a D-linked *which*-phrase that has not undergone *wh*-movement prior to the CP complement selection by the functional D. The bisecting CP process for *which x/that* constructions would then basically be the same as relative clause constructions. So, the sentence:

(180) I wonder which dish that Mary bought

The *which x/that* derivation would begin with the verb *wonder* selecting a D complement and a subordinate clause containing *which dish* in-situ.

(181) I [V wonder] => D
[CP [C +Op] [TP Mary bought which dish]]

Normally, in indirect question clauses, a *wh*-phrase would undergo *wh*-movement and then be selected by the verb. In this derivation, the *wh*-phrase is D-linked; i.e. there is a set N of dishes that the speaker and the hearer have in mind. The *wh*-phrase remains in-situ. The functional D then selects the CP for its complement.

- (182) [CP [TP Mary bought which dish]
I wonder [DP [D] [CP [C +Op] [TP Mary bought which dish]]] *Functional D
Selects CP Complement*

As with relative clause derivations, the functional D has a selectional N feature which must be checked within its minimal domain. This is the motivation for movement of the DP *which dish* into the CP.

- (183) John wondered[DP [D] [CP which dish [C +Op] [TP Mary bought *t*]]] *A' movement*

At this point, *which dish* is now inside the CP, but it is D-linked so is not quantificational and does not serve as an operator. Once again, there is an added argument created by the external D, so the CP must bisect.

- (184) I wonder [DP [D] [CP which dish [CP which dish [C +Op] [TP Mary bought *t*]]]]] *CP Bisection*

The lower copy of *which dish* deletes under identity.

- (185) I wonder [DP [D] [CP which dish [CP ~~which dish~~ [C +Op] [TP Mary bought *t*]]]]] *Deletion Under Identity*

The D *which* in the DP *which dish* incorporates upward out of the CP into the functional D, lexicalizing the D.

- (186) I wonder [DP [D which] [CP ~~which dish~~ [CP ~~which dish~~ [C +Op] [TP Mary bought *t*]]]]] *D incorporation*

There would however be two distinct issues that arise in *which x/that* constructions that do not do so in relative clause constructions. The first issue is that a *which x* clause cannot contain a relative pronoun.

(187) *I wonder which dish which Mary bought

The reason for this is that C contains a [*wh*] feature and this feature is checked by the [*wh*] feature carried by *which* in *which dish*. When *which dish* is deleted in the lower CP through identity, the feature stays checked in the same way that the operator feature stays checked. The only available option from the relativizer feature bundle that does not carry a [*wh*] feature is the complementizer *that*.

(188) I wonder [DP [D] which][CP dish [CP [C that] [TP Mary bought *t*]]]
Relative That Spell-out

An interesting anomaly is noted in Belfast English that lends support to the Bisecting CP Hypothesis analysis of *which x/that* clauses. Assuming that the lower CP copy of the complex *wh*-phrase is the copy that is deleted, a raised PP with a complex *wh*-phrase as its complement would then leave the preposition stranded in the lower CP. As argued earlier, a preposition cannot be stranded within the CP without its complement. Since the [*wh*] feature has already been checked by the deleted *wh*-phrase in the lower CP, an appropriate *wh*-pronoun cannot be spelled out in the complement position of the preposition and therefore the derivation will crash.

(189) I wonder [CP that she put the candy in which box]

(190) *I wonder [CP which box [CP in ~~which box~~ [she put the candy *t*]]]

The only way to render the sentence grammatical is to assume an un-bisected CP, as has been argued with *wh*-movement. If a PP, with a complex *wh*-phrase complement, moves into Spec CP as is expected in the analysis of a traditional CP, then there should be no spellout of the complementizer since this would violate the Doubly Filled COMP rule in English.

(191) I wonder [which box that [she put the candy in]]

(192) *I wonder [in which box that [she put the candy]]

As Henry confirms (personal communication, March 4, 2015) this is exactly what is found in Belfast English. The above observations of *which x/that* constructions under a Bisecting CP analysis combined with the example of a pied-piped preposition in *wh*-

movement of a complex *wh*- phrase suggests that Belfast English does not violate the Doubly Filled COMP rule as previously assumed by Henry (1995).

The other issue that arises in *which x/that* constructions that does not do so in relative clause constructions concerns the case of the *which x* phrase in the higher CP.

Normally, the D in the head nominal DP incorporates into the external D. The purpose of this incorporation is so that that the D can receive case from the matrix verb and therefore the NP inside the CP would also be accessible for case assignment from the matrix verb. It is clear from the Icelandic examples that complex *wh*-phrases do not receive their case for the matrix verb but instead from the subordinate verb. So if *which* incorporates with the external D, then the NP *dish* would receive its case from the matrix verb and the sentence would be ungrammatical. However, wide case syncretism in English means that there are almost no case distinctions left in NPs in English to indicate case mismatch and cause ungrammaticality.²⁴ As will be discussed later in another issue concerning case syncretism, case effects tend to be concerned with the morpho-phonological case form rather than abstract case features (van Riemsdijk, 2000).

While the main difference between simple and complex *wh*-phrases seems to be that complex *wh*-phrases can be discourse linked, the Bisecting CP Hypothesis allows for the plausibility that, in at least one observed asymmetry, the difference is syntactic. With the issue of relative clauses and *wh*-interrogatives covered, attention will now be turned to an item of syntax that has similarities to both relative clauses and interrogatives.

6 Free Relatives

Recall that a relative clause is formed when a relative pronoun or complementizer appears together with the nominal head. The relative clause functions as a post-modifier of the head. In the following example, *the book* is modified by a relative clause.

²⁴ It remains to be determined if this observation holds for other languages that exhibit *wh-x/that* clauses.

(172) I returned *the book* that you finished reading to the library (headed relative clause)

However, there are instances where a relative clause appears to lack a head as in example (173). Because these clauses lack any apparent head, they are sometimes referred to as headless relatives or free relatives. For this section, the term free relative will be used.

(173) I returned *what* you finished reading to the library (free relative)

Free relative constructions often appear to be identical to those of interrogatives.

(174) I will buy *what* he is selling (free relative)

(175) I will ask *what* he is selling (interrogative)

In their paper, “The Syntax of Free Relatives”, Bresnan and Grimshaw (1978) compare and contrast interrogatives with free relatives. They note one distinguishing property between free relative and interrogative clauses is that the free relative pronoun can be suffixed by *-ever*. This is not the case with interrogative pronouns.

(176) I will buy *whatever* he is selling

(177) *I will ask *whatever* he is selling

Bresnan and Grimshaw do acknowledge that *ever* can be used in interrogatives “as a temporal quantifier or intensifier” (p.334).

(178) What *ever* is the matter with him now?

However, they argue that these *evers* “float”, meaning that they are unattached to the interrogative pronoun, as demonstrated by the separation of *ever* and the interrogative in the following example.

(179) What is *ever* the matter with him now?

The *ever* of free relatives, they assert, cannot float but rather is in a bound form.

(180) I kissed *whoever* she kissed

(181) *I kissed who she *ever* kissed

The *ever* of free relatives is sometimes obligatory and sometimes optional, depending on the form of the free relative pronoun and semantic considerations. One exception is that unlike *what*, *which* must be suffixed by *ever* when used as a free relative. This fact may be related to the issue observed earlier that *which* generally cannot stand alone inside the CP.

(182) I will take *whichever* you give me

(183) *I will take *which* you give me

In regards to more differences between interrogative and free relatives, Bresnan and Grimshaw cite the study from Baker (1968) where he observes that, like relative clauses, free relatives may not contain multiple *wh*-phrases, unlike interrogative complements.

(184) I have to remember *who* is applying for *what*. (interrogative)

(185) *I have to interview someone *who* is applying for *what*. (relative clause)

(186) *I have to interview *whoever* is applying for *what*. (free relative)

However, Bresnan and Grimshaw note that free relative clauses do not behave like relative clauses or interrogative clauses with respect to pied-piping.

(187) a. I will read the paper which Mary is working on

b. I will read the paper on which Mary is working

(188) a. I wonder which paper Mary is working on

b. I wonder on which paper Mary is working

(189) a. I will read whatever paper Mary has worked on

b. *I will read on whatever paper Mary has worked

The verb *read* only selects DPs for its direct object complement and cannot take a PP, so the free relative pronoun headed by a preposition renders example (189)b ungrammatical.

Along this same theme, van Riemsdijk (2000), in his paper “Free Relatives”, focuses on the selectional properties of the matrix verbs to differentiate between free relative and interrogative clauses. For instance, the verb *buy* selects for noun phrases while the verb *ask* selects questions.

(190) I will buy *what* he is selling

(191) I will ask *what* he is selling

This becomes clearer if the *wh*-phrase being examined is replaced by a noun phrase such as *the car* or a question introduced by *whether*.

(192) I will buy *the car* he is selling

(193) *I will buy *whether* he is selling the car

(194) *I will ask *the car* he is selling

(195) I will ask *whether* he is selling the car

Also, verbs that select for questions can be followed by a complex *wh*-phrase such as *which car*.

(196) *I will buy *which car* he is selling

(197) I will ask *which car* he is selling

The above information makes it clear that while there may be a superficial resemblance between interrogatives and free relatives, there remains clear semantic and syntactic differences. Moreover, difficult syntactic problems arise from the fact that they appear to be different.

The first and most pressing problem is determining the precise structure of a free relative clause. Clauses with *wh*-phrases are CP clauses. However, from van Riemsdijk's work, it could be concluded that free relatives are noun phrases or DPs which contain a CP, very much like the DPs that head relative clauses. If the free relative is a DP and heading a CP then syntactically they would be the same as overtly headed relative clauses. Van Riemsdijk raises the question as to whether there is a head at all in free relative constructions. If free relatives are headless, then syntactically, they would be the same as embedded interrogative *wh*-phrases.

Two competing analyses have developed to answer the issues raised above. The first, called the Head Hypothesis, from by Bresnan and Grimshaw (1978), basically states that the free relative is base generated as the head of the relative clause. This idea corresponds with the head external analysis of relative clauses and effectively renders free relatives syntactically in the same way as relative clauses. However, just as the

head external analysis has fallen out of favor due to the analysis of reconstruction effects, the Head Hypothesis for free relatives faces the same problem since there is clearly a relationship between the free relative head and the free relative clause.

(198) I will buy *what*_i he is selling [e]_i

Normally, it would be argued that such a dependency is due to movement, but is noted above that Bresnan and Grimshaw (1978) argue that the head free relative is base generated. They instead propose a deletion rule called Controlled Pro Deletion (P. 348) in which a pronominal element in the relative clause is deleted and then its trace is coindexed with its antecedent through identity. The canonical position of in Spec CP is either empty, or absent as Bresnan and Grimshaw argue that the clause that follows free relatives is a reduced clause.

The other analysis is the COMP Hypothesis first proposed by Groos & Van Reimsdijk (1981) and argues that the free relative is in the CP and that it is the head position that is empty, or contains an empty element such as PRO or pro or a trace of some kind, but none the less empty of lexical material. Both of these proposals have motivation and faults.

6.1 Category Matching

Evidence for the Head Hypothesis is observed in one of the more prominent properties of free relatives: the category matching effects that they exhibit. Consider the following headed relative clause.

(199) I will interview [the linguist] [with whom he works]

The verb *interview* takes DP direct objects and can therefore take a headed relative clause as its complement. However, when the head is missing, the sentence is ungrammatical since the relative clause begins with a PP.

(200) *I will interview [with whom he works]

A free relative construction, one headed by a PP would also be ungrammatical, since the verb *interview* requires a DP direct object complement.

(201) *I will interview [with whomever he works]

However, if the free relative is also a DP, then the construction is grammatical.

(202) I will interview [whomever he works with _]

The acceptability of (202) seems to be due to the fact that the matrix verb requirement and the gap in the relative clause are of the same phrasal type, in this case, a DP.

Van Riemsdijk (2000) states that not only can free relatives be headed by a DP, but they can also be headed by an AP or a PP. He gives the following data (p.12):

- (203)
- a. the police arrested *who* the witness identified (DP)
 - b. They intend to live *in whatever town their* parents used to live (PP)
 - c. She will make you *however happy* your ex made you (AP)
 - d. I'll play my music *however loudly* you play yours (AP)

In the above examples, the italicized phrases meet the phrase requirements of both the matrix verb and the relative clause and therefore the categories match.

However, van Riemsdijk notes that AP/PP free relatives have certain restrictions imposed on them that DP free relatives do not. The first restriction has to do with the two main semantic types of free relatives – definite/specific and universally quantifying. Consider the following example.

(204) You should return *what you have finished reading* to the library

The meaning of the free relative is ambiguous. In the definite reading, it means that you should return the specific book or magazine or other specific item that you have finished reading to the library. In the universally quantifying reading, it means that you should return anything (whatever that may be) that you have finished reading to the library. Van Riemsdijk states that in AP/PP free relatives, there is a “very strong bias” for the universally quantifying type as the above examples b, c and d in (203) demonstrate.

The second restriction imposed upon AP/PP free relatives is that the matching requirement is stricter than for a DP. In most cases of AP/PP free relatives, the matrix

and relative clause verb are identical. When different verbs are selected, there is less acceptability.

- (205) a. You can dance with whomever I dance.
b. ?You can dance with whomever I came to the party.
c. I will keep my bedroom however dark you keep your room.
d. ?I will keep my bedroom however dark you paint your room

Given the above asymmetry between DP free relatives and AP/PP free relatives, most research has focused on DP free relatives.

The Head Hypothesis can account for the matching effects encountered in all these free relative clauses. Since the *wh*-phrase is the head of the phrase, it must satisfy the requirements of the matrix verb. Under Controlled Pro Deletion, the deleted pronominal element must match through identity, i.e. be of the same phrasal category. On the other hand, the COMP Hypothesis offers no explanation for category matching effects, other than suggesting that the CP is somehow “accessible to government from the outside” (p. 10).

While the Head Hypothesis seems to be a plausible solution to the analysis of free relatives, van Riemsdijk points out that if the *wh*-phrase is indeed in the head position then what follows the head should be a relative clause. However, these clauses lack a complementizer or relativizer. He gives the following two paradigms:

(206) I put [the pie] [which/*which that/that/∅ you prepared] in the refrigerator

(207) I put [what] [*which/*which that/*that/∅ you prepared] in the refrigerator

Since the above paradigms are not identical, as would be expected if the *wh*-phrase occupies the same position of a head nominal, van Riemsdijk argues that the COMP hypothesis is more suited to explaining the discrepancy between examples (206) and (207) by positioning the *wh*-phrase inside the CP.

(208) I put [the pie] [which/*which that/that/∅ you prepared] in the refrigerator

(209) I put [-----] [what/*what that/*that/*∅ you prepared] in the refrigerator

6.2 Case Matching

Another prominent property of free relative clauses is that of case matching. Generally, a free relative construction is grammatical only when the case of the free relative pronoun matches both the matrix verb and the relative clause requirements. Again, in a minimally inflected language such as English, the matching of case is not immediately obvious; however it becomes clear in a more inflected language such as German. The following examples are provided by van Riemsdijk (p. 16)

- (210) a. Wer nich stark ist muss klug sein
wh_{NOM} not strong is must clever be
'Who is not strong must be clever'
- b. *Wen/*wer Gott schwach geschaffen hat muss klug sein
whom_{ACC}/wh_{NOM} God weak created has must clever be
'Who God has created weak must be clever'
- c. *Wem/*wer Gott keine Kraft geschenkt hat muss klug sein
wh_{DAT}/wh_{NOM} God no strength given has must clever be
'Who God has given no strength must be clever'
- (211) a. Ich nehme wen du mir empfiehlst
I take wh_{ACC} you me recommend
'I take whom you recommend to me'
- b. Ich nehme *wem/*wen du vertraust
I take wh_{DAT}/whom_{ACC} you trust
'I take who you trust'
- c. Ich nehme *wer/*wen einen guten Eindruck macht
I take wh_{NOM}/whom_{ACC} a good impression makes
'I take who makes a good impression'
- (212) a. Ich vertraue wem du vertraust
I trust wh_{DAT} you trust
'I trust who you trust'
- b. Ich vertraue *wen/*wem du mir empfiehlst
I trust whom_{ACC}/wh_{DAT} you me recommend
'I trust who you recommend to me'

- c. Ich vertraue *wer/*wem einen guten Eindruck macht
 I trust who_{NOM}/who_{DAT} a good impression makes
 ‘I trust who makes a good impression’

Van Riemsdijk notes that the paradigm above creates a restriction on free relative constructions since, as he states, in a rich case system such as German, there are not many opportunities for the case to match the requirement of the matrix verb and the relative clause (p. 16). He points out that, while restrictive, if the *wh*-phrase is really a shared constituent, then case matching is the only option available. However, rich case languages can also employ strategies to accommodate mismatches that may occur. One strategy involves using a “semantically minimally specified head”, generally a pronoun. Another strategy is case attraction whereby the case of the free relative pronoun is attracted to the case of either the matrix verb (upward attraction) or the relative clause (downward attraction).

One other way apparent mismatches of case are resolved is through case syncretism. Case syncretism is where multiple case functions are realized in just one inflected form. For example, for *who/what* in German, both the nominative/neuter and the accusative/neuter are of the same form *was*.

- (213) Was du gekocht hast ist schimmelig
 What you cooked have is moldy
 ‘What you have cooked is moldy’

- (214) Ich esse was in Kühlschrank liegt
 I eat what in the refrigerator lies
 ‘I eat what lies in the refrigerator’

Both of these examples are grammatical despite the fact that in example (213), *was* is nominative for the matrix and accusative for the free relative. In example (214), the reverse is true: *was* is accusative for the matrix and nominative for the free relative. These examples demonstrate that the case syncretism of nominative/neuter and accusative/neuter *was* allows free relative construction with mismatching case. Van Riemsdijk concludes that given the data above, the case matching effect must be concerned with the morpho-phonological case form and not abstract case features. This

information could have an effect on free relative clause constructions in languages that have experienced greater case syncretism, such as English. It should be noted that the above examples (213) and (214) are also both grammatical in English.

It is not entirely clear how the Head Hypothesis would satisfy the case requirements, since the same phrasal categories can be assigned different cases. It is also not clear why, under COMP hypothesis, the free relative pronoun would have to match the case that would be assigned to it by the matrix verb, even if an empty head were present in the structure. It seems then that neither the Head Hypothesis nor the COMP hypothesis is the correct analysis of free relative clauses.

6.3 The Bisecting CP Hypothesis and Free Relatives

An answer to the status of the free relative pronoun can be found if the aspects of the Bisecting CP Hypothesis are applied to free relative constructions. However, before discussing the derivation of free relative clauses, the status of the pronoun needs to be clarified. In restrictive relative clauses, I argued that the relative pronoun does not undergo movement as Kayne (1994) and Bianchi (1999) have argued in their models of the raising analysis. Instead, I have suggested that relative clause pronouns are spelled-out due to the checked *Op* feature in the lower portion of the bisected CP. Therefore the free relative *what* in the following example cannot be a relative pronoun but is a simple *wh*-phrase that has undergone *wh*-movement.

(215) I will buy *what* he is selling

So one important difference between free relatives and headed relative clauses is that the raised item does not involve movement initiated by a functional D, but rather first involves *wh*-movement, which is contrary to Bresnan and Grimshaw (1978) who argue that the head free relative is base generated. The derivation for example (215) begins as it has for all other previous examples, with a matrix verb, here *buy*, which selects a D complement and a subordinate clause with *what* in its base generated position.

(216) I will buy =>D

[CP [TP he is selling what]

Before the D selects the CP as its complement, *what* must undergo *wh*-movement to take its scope position in the subordinate clause.

(217) [CP what [TP he is selling *t*]] *Wh-Movement*

I also argued earlier that interrogative clauses formed by *wh*-movement do not involve a bisected CP since the matrix verb is only subcategorizing for a clausal complement, which the un-bisected CP satisfies. However, in free relatives, the matrix verb is subcategorizing for a functional D which then selects the CP

(218) I will buy [DP [D] [CP what [TP he is selling *t*]] *Functional D Selection of the CP*

As was the case with relative clauses, the functional D should cause the CP to bisect. However, bisection would have to take place after the *wh*-phrase takes its scopal position through *wh*-movement.

(219) I will buy [DP [D] [CP what [CP what [TP he is selling *t*]] *CP Bisection*

The lower *what* would then delete under identity and leave the *Op* function checked.

(220) I will buy [DP [D] [CP what [CP ~~what~~ [TP he is selling *t*]] *Deletion under Identity*

However, although this structure is the same as a complex *wh*-phrase/*that* derivation, the D-linked complex *wh*-phrase underwent movement to the CP do to the nominal selectional properties of the functional D, not by *wh*-movement to realize quantificational force, which was argued it does not have. In this free-relative derivation, the bisection of the CP presents a problem since the *wh*-phrase, which is an overt quantifier, has been removed from its scope taking position in the clause and is now represented presumably by an empty operator. Here I would add that, although complex *wh*-phrases in certain dialects of English, as discussed earlier, allow complex *wh*-/*that* constructions, simple *wh*-phrases undergoing *wh*-movement into the CP do not permit *wh*-/*that* constructions, whether in indirect question clauses or free relative

clauses. In an un-bisected CP, this is because of a doubly filled COMP violation, which contemporary English does not allow.

(221) *I wonder what that Mary bought

(222) *I will buy what that he is selling

For these reasons, the bisection of the CP cannot be the proper analysis for free relatives. Therefore, simple *wh*-phrases that undergo *wh*-movement to the CP do not undergo bisection regardless of the external D. However, this still leaves a configuration where the free relative *what* is within the minimal domain of the functional D, which means that *what* is in a position to be governed by the external D.

(223) I will buy [DP [D] [CP what [TP he is selling *t*]]]

Such a situation is reminiscent of that in the raising analysis of relative clauses where a raised NP would receive case from both the matrix verb and the subordinate verb, leading to the problem of case discussed by Borsley (1997) earlier.

Case is still very much an issue with free relative clauses. However, as observed by van Riemsdijk above, the case of a free relative pronoun bestowed on it by both the matrix and the subordinate verb is, in most cases, the same, which is exactly what the derivation in (223) accounts for. While it is difficult to see the case matching in English, it becomes clear in German. The following examples are from van Riemsdijk, repeated here.

(224) a. Ich vertraue wem du vertraust

I trust whom_{DAT} you trust

‘I trust who you trust’

Ich vertraue [DP [D]][CP wem [TP du vertraust]]]

b. Ich vertraue *wen/*wem du mir empfiehlst

I trust whom_{ACC}/who_{DAT} you me recommend

‘I trust who you recommend to me’

Ich vertraue [DP [D] [CP *wen/*wem [TP du mir empfiehlst]]]

c. Ich vertraue *wer/*wem einen guten Eindruck macht

I trust who_{NOM}/who_{DAT} a good impression makes

‘I trust who makes a good impression
 Ich vertraue [DP [D] [CP *wer/*wem [TP einen guten Eindruck
 macht]]]

In example (224)a, free relative pronoun *wem* receives dative case from both the matrix verb *vertraue* and the subordinate verb *vertraust*. When *wem* undergoes *wh*-movement, it already has dative case marking. The functional D receives its dative case from the matrix verb and can govern *wem* because their cases match. Examples (224)b and c are ungrammatical because the free relative pronoun and the functional D cases clash. So the functional D, while being in a position to govern the free relative pronoun, is in fact agreeing with it.

Moreover, in situations where a free relative exhibits case syncretism, construction with mismatching case is allowed.

(225) Ich esse *was* in Kühlschrank liegt
 I eat *what* in the refrigerator lies
 ‘I eat what lies in the refrigerator’

At first, this situation seems counterintuitive as the free relative pronoun and the functional D would receive different cases. However, from the data in German, van Riemsdijk concludes that case matching must be concerned with the morpho-phonological case form and not abstract case features. In other words, case for free relatives could be realized at the PF level rather than at LF level. Since the accusative form of *what* in German is morpho-phonologically the same as the nominative case, the case matches at the PF level.

Besides the issue of case, there are other reasons for accepting an un-bisected CP headed by a functional D as the analysis of free relative clauses. Firstly, this analysis can account for the category matching effects observed in free relatives. In embedded interrogatives such as (226)a and b, a simple *wh*-phrase that has undergone *wh*-movement is acceptable with the preposition pied-piped or stranded, because, although the subordinate verb can either subcategorize for a DP or a PP, the matrix verb is only subcategorizing for a clausal complement.

- (226) a. John knows who Mary works with *t*
 b. John knows with whom Mary works *t*

. However, recall that this is not the case for free relatives.

- (227) a. John will interview whoever Mary works with *t*
 b. *John will interview with whoever Mary works *t*

Van Riemsdijk (2000) states that in examples like (227)a, the subcategorization properties of both the matrix and the subordinate verb must match. The sentence is grammatical because the *wh*-phrase is capable of satisfying the subcategorization requirements of both verbs. In (227)b, the verb subcategorization properties of the matrix and subordinate verb do not match, and so there is no way for the lone *wh*-phrase to satisfy both verb subcategorization requirements.

Secondly, free relative constructions are closer to interrogative clauses than to headed relative clauses. Riemsdijk observes that in German, questions are constructed by *wh*-words, as are free relatives, while headed relatives use *d*-words. The data is from van Riemsdijk (p. 22).

- (228) a. Peter fragte wen ich vorzeihe
 Peter asked whom I prefer
 ‘Peter asked whom I prefer’
 b. Peter hasst den Mann den ich vorzeihe
 Peter hates the man whom I prefer
 ‘Peter hates the man whom I prefer’
 c. Peter hasst wen ich vorziehe
 Peter hates whom(ever) I prefer
 ‘Peter hates whomever I prefer’

Van Riemsdijk notes that a similar paradigm occurs in Swiss German which forms relative clauses with “an invariable complementizer element *wo* and a resumptive personal pronoun *in situ*” (p.22). Free relatives are similar to questions which are formed by *wh*-movement, like English and German. Again, from van Riemsdijk, (p.22):

- (229) a. De Peter wet wüsse mit wem s Susi redet

The Peter wants know with whom the Susi talks

‘Peter wants to know with whom Susi talks’

b. De Peter redet mit em maa wo s Susi mit em redet

The Peter talks with the man that the Susi with him talks

‘Peter talks with the man that Susi talks with’

c. De Peter redet mit wem s Susi redet

The Peter talks with whom the Susi talks

‘Peter talks with whomever Susi talks’

If the correct analysis for free relatives were a bisected CP, then it would create a structure that would be exactly the same as the structure for headed relative clauses and would therefore be unable to capture the asymmetry of the paradigms above.

An un-bisected CP headed by a functional D analysis also explains why free relative clauses lack a complementizer or relativizer since this would create a doubly filled COMP violation and properly explains the paradigm noticed by van Riemsdijk between headed relative and free relative clauses.

(230) a. I put [the pie] [which/*which that/that/∅ you prepared] in the refrigerator

b. I put [DP [D the] [CP pie [CP which/that [TP you prepared in the refrigerator]]]]

(231) a. I put [what] [*which/*which that/*that/∅ you prepared] in the refrigerator

b. I put [DP [D] [CP what [TP you prepared in the refrigerator]]]

All the information presented above suggests that, rather than a bisecting CP as proposed for relative clauses, an un-bisected CP headed by a functional D explains all the discussed issues of free relative clauses.

7 Conclusion

In this thesis, I introduced a new hypothesis to the analysis of relative clauses that also has implications for embedded interrogatives, free relative clauses, and some Doubly Filled COMP examples. I proposed that a bisecting CP could provide a solution to the issues surrounding current theories of relative clauses. Labelled the Bisecting CP Hypothesis, it unifies the current raising and matching analyses. The hypothesis allows for reconstruction of the internal relative clause head and, moreover, it allows for a full DP internal head where the D can be incorporated into the external functional D to allow for the assignment of case to its dependent NP. In turn, the nominal selectional properties of an external D also provide the motivation for the movement of the relative clause internal head to the CP and allows for a relative clause to form a constituent that excludes the head of the relative. Most importantly, the Bisecting CP Hypothesis allows for the external and internal relative heads to receive separate case and theta assignments, while also allowing a point in the derivation in which there are two copies of the relative clause head DP upon which Koster-Moeller's ellipsis licensing algorithm can operate.

The Bisecting CP Hypothesis has other implications beyond those for relative clauses. For example, by comparing the bisected CP of a relative clause to the un-bisected CP of an embedded interrogative, it was demonstrated that although *wh*-pronouns in embedded interrogatives undergo *wh*-movement, relative clause pronouns, contrary to Kayne's and Bianchi's analyses, do not undergo movement but are base generated in the CP. Relative clause pronouns are present in the derivation of relative clauses due to the spell-out of features in the CP rather than the raising of quantificational operators.

Also, by investigating further van Craenenbroeck's assertion that complex *wh*-phrases are not syntactic operators and combining it with Pesetsky's and Reinhart's arguments which allow a *which*-phrase to remain in-situ at LF, the Bisecting CP Hypothesis provides a plausible solution to *which x/that* constructions in certain languages and dialects and provides some evidence that, at least in this one paradigm, the difference between simple and complex *wh*-phrases has syntactic implications. Moreover, if the hypothesis is correct, then examples of *which x/that* constructions in English are not the result of a violation of the Double Filled COMP filter.

While it would seem a natural extension of the hypothesis for free relatives to also require a bisected CP, and thus have a syntactic structure very similar to relative clauses, the empirical evidence from the data of free relative clauses suggests that their construction does not involve a bisecting CP. Instead an un-bisected CP headed by a functional D provides the necessary structure to explain the category and case matching properties of free relative clauses, as well as demonstrating why free relative clauses lack a complementizer or relativizer. Furthermore, the *wh*-movement analysis for *wh*-phrase provides a reason as to why free relative clauses more closely resemble indirect question clauses than headed relative clauses.

In the end, a rather attractive paradigm has been produced by the hypothesis that alludes to the similarities and the differences of three clause types

- (232) Indirect question clauses – no functional D, un-bisected CP
- (233) Headed relative clauses – functional D, bisected CP
- (234) Free relative clause – functional D, un-bisected CP

As with most research, some questions remain unanswered. Further research is required to investigate the reasons why relative pronouns and relative *that* appear to be optional in some cases and mandatory in others. Also it would also be of interest to examine whether the hypothesis could provide an answer to why infinitival subject and non-subject relative clause constructions do not allow relative pronoun spell-out. As a final thought, if the Bisecting CP Hypothesis is on the right track, perhaps bisection occurs in other layers of the clause. One area of possibility could be the VP.

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