Factivity Mirrors Interpretation: The Selectional Requirements of Presuppositional Verbs*

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Abstract

Different verbs can take different kinds of arguments. Factive verbs such as *remember* and *forget* take clausal complements which are presupposed to be true. Verbs such as *say* and *think* do not presuppose the truth of their complements. I suggest that the complements of presuppositional verbs like *remember*, *forget*, *admit* and *deny* are actually definite DPs, picking out a discourse referent in the Common Ground. It has been established that certain effects arise in clauses embedded by presuppositional verbs: only complements can be extracted from them and argument fronting inside of them is not allowed. We also note that they can have DP pro-forms (*which*). This stands in opposition to non-presuppositional clauses, where extraction and fronting are possible, and only CP pro-forms (*as*, *so*) are possible. The DP view allows for a uniform solution to these puzzles, based on spoken and signed languages; the crucial distinction is whether the matrix verb selects for a definite entity (presuppositional) or for a proposition (nonpresuppositional). Finally, we introduce crosslinguistic data showing that the entity/proposition split parallels a split in interpretation between DP and CP complements: a presuppositional DP complement is interpreted like a presupposed entity, while a nonpresuppositional CP complement has the semantics of a novel proposition. This way of looking at clausal complements also allows us to account for the behavior of sentential subjects, which have been argued to be both nominal and factive. I flesh out these generalizations and show that they emerge as a natural result in our framework. With sentential subjects as with clausal complements, factivity and presupposition correlate with the syntactic category of the argument. I take this to imply a form-meaning isomorphism in the syntax and semantics of what a verb licenses (DP vs CP).

1 Introduction

This paper is a study in the kind of arguments that a verb can take. When considering the argument of a verb, it is tempting to assume that there is a straightforward mapping from the

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syntax to the semantics: a DP complement would be an individual whereas a CP one would be a clause. However, since at least Grimshaw (1979) we have recognized that this view is not always correct: verbs like *ask* can take a question as their semantic complement but either a DP or a CP as their syntactic complement. Grimshaw was led to discuss two kinds of selectional requirements on complements, c-selection (syntactic) and s-selection (semantic). Additional work since has focused on the question of whether the two could be assumed under a single licensing requirement or not (Grimshaw 1981; Pesetsky 1982, 1992, 1993; Rothstein 1992; Odijk 1997).

Our contribution adds to the discussion of what is licensed by the verb. We point out that a direct mapping from syntax to semantics is not only possible for certain verbs but is the preferred option, since is brings along additional empirical benefits. Concretely, we will take the case of PRESUPPOSITIONAL VERBS. These are verbs such as *deny* and *know* which presuppose the existence of a clausal discourse referent as their complement. A number of observations have been made about the class of presuppositional verbs, to be elaborated immediately below (or about factive verbs, which form a subset of the larger class). We will argue that these verbs always take a DP argument. This idea will initially be motivated on semantic grounds, but taking it seriously will lead to a unified explanation for a range of facts concerning presupposed elements in a range of languages, some previously attested in other contexts, some not yet.

We may begin with the filecard metaphor from the "file change semantics" of Heim (1982, 1983). This theory of discourse envisions a conversation as a file with different filecards. Each filecard is a discourse referent. Introducing a new discourse referent creates a new filecard, whereas making a comment regarding an existing discourse referent involves updating its filecard. All filecards make up the common ground, CG. Definite descriptions refer to existing filecards (discourse referents) and indefinite descriptions create new filecards (discourse referents). We will think of entire propositions as filecards.

Linguists have often found it beneficial to divide verbs into two broad classes, factive and nonfactive (Kiparsky and Kiparsky 1970). The former presuppose the truth of their complements and include English verbs such as *know*, *regret* and *remember*. The latter include other verbs expressing thoughts and attitudes, and do not presuppose the veracity of their complements. Such verbs are *think*, *say* and *claim*. But as we have already pointed out, this is not the best distinction to make. We intend to treat factives along the same line as verbs like *deny*, *confirm* and *accept*. The only special thing about factive verbs is their lexical semantics, which dictates that their complement be true. That is to say, the syntactic behavior of all presuppositional verbs is identical. Some of these verbs might have particular semantics, but this plays no role in the syntax. The interpretation of *know* is such that is complement is taken to be true, while the interpretation of *deny* does not. Still, the same syntactic constraints apply to both, to the exclusion of verbs like *think* or *say*.

Here is a taste of things to come. For a number of decades now it has been observed that clauses introduced by presuppositional verbs pattern differently than patterns introduced by non-presuppositional verbs. First, **extraction** of complements is allowed from both (a), while extraction of subjects and adjuncts is allowed from non-presuppositionals only (b-c). In other words, presuppositional verbs are weak islands.

(1) Nonpresuppositional (nonfactive):

a. *What do you think that John stole ___?*

b. *Who do you think ___ stole the cookies?*

c. *Why do you think John stole the cookies ___?*

(2) Presuppositional:

a. *What do you remember/deny that John stole ___?*

b. * *Who do you remember/deny ___ stole the cookies?*

c. # *Why do you remember/deny that John stole the cookies ___?*[1]

To these examples we add novel data from Hebrew and other languages, showing that presuppositional clauses can be introduced by a determiner. In this case no element can be extracted (3). This is similar to the case of clauses in English prefaced by *the fact that*, in which no extraction is possible either (4). These "full" DPs are thus strong islands. We will call them Overt Definite Presuppositionals.

(3) HEBREW

a. * *ma ata zoxer et* ***ze*** *še-dani ganav ___?*
what you remember ACC **this** COMP-Danny stole
(int. 'What do you remember the fact that Danny stole?')

b. * *mi ata zoxer et* ***ze*** *še-___ ganav et ha-ugiot?*
who you remember ACC **this** COMP stole ACC the-cookies
(int. 'Who do you remember the fact that stole the cookies?')

c. # *lama ata zoxer et* ***ze*** *še-dani ganav et ha-ugiot?*
why you remember ACC **this** COMP-Danny stole ACC the-cookies
(int. 'Why do you remember the fact that Danny stole the cookies?')

(4) ENGLISH

a. * *What do you remember* ***the fact*** *that John stole ___?*

b. * *Who do you remember* ***the fact*** *that ___ stole the cookies?*

c. # *Why do you remember* ***the fact*** *that John stole the cookies ___?*

In order to explain the weak islandhood effects we adopt the analysis of presuppositional islands in Honcoop (1998). Honcoop argues that a number of islandhood constructions can be explained through semantic well-formedness constraints within a dynamic semantics framework. Importantly, his account of presuppositional islands stipulates an existential requirement of a discourse referent. This is no mere stipulation if our system is adopted; instead, Honcoop's semantics can be derived directly from the syntactic structure. The strong islands then remain to be analyzed as run-of-the-mill complex DPs, out of which all extraction is banned.

Second, **fronting** is allowed in nonpresuppositional clauses but not in presuppositional clauses:

(5) Nonpresuppositional:

a. John **thinks** that [this book, Mary read].

b. I can **assure** you that [that film, I don't want to ever see again].

(6) Presuppositional:

a. * John **regrets** that [this book, Mary read].

b. * John **remembers** that [this book, Mary read].

[1] Ungrammatical on the intended "low" reading.

Our analysis requires one tweak: the left periphery of the CP embedded in the presupposed DP lacks Topic and Focus projections. The fronting ban arises since the fronted elements have no clause-initial landing site.

If the complements of presuppositional verbs are definite descriptions, the prediction is that they should display **DP-like properties**. We will see that this is correct. Here is a taste of things to come. Potts (2002) discusses the difference between anaphoric *as*, which refers to CPs, and anaphoric *which*, referring to DPs. Following Ross (1984), he shows that the presuppositional verbs *know* and *realize* embed both DPs and CPs (7). But we point out that non-presuppositional verbs can only embed CPs, not DPs. These verbs do not take DPs, and so *which* cannot refer to their moved complements (8).

(7) a. [Americans should get cheap oil], **as** the whole world knows ___. (CP)

b. [Americans should get cheap oil], **which** the whole world knows ___. (DP)

(8) a. [Americans should get cheap oil], **as** the whole world says/claims ___. (CP)

b. *[Americans should get cheap oil], **which** the whole world says/claims ___. (DP)

If the first class of verbs takes a DP embedding a CP, and the second takes only a CP, these facts can be explained easily.

The next step is to extend the discussion of complementation beyond presuppositional verbs. We will see that **differences in interpretation** arise depending on the kind of complement selected for, DP or CP. This part of the discussion is limited to some non-presuppositional verbs, for example *explain*: depending on whether its complement is a DP (9) or a CP (10), its interpretation is one of "explaining why" or of "saying something by way of explanation". These observations are also shown to hold crosslinguistically.

(9) DP, explaining why the building collapsed:

a. He **explained** [$_{DP}$ the building's collapse].
…The contractor was a crook, the building supplies were bought cheap and safety regulations were flaunted.)

b. ≈He **explained** [$_{DP}$ the fact that the building collapsed].

(10) CP, saying that the building collapsed:
He **explained** [$_{CP}$ that the building collapsed].
…and that's why the police closed off the street.

Work on argument structure has taught us that the interpretation of a DP complement to the verb may be idiosyncratic (Marantz 1984; Kratzer 1996). What we see here is that the interpretation of a CP complement is predictable. The interpretation of *explain* and its complement varies depending on whether the complement is a CP or a DP. This behavior of the verb *explain* was the subject of Pietroski (2000); Halpert and Schueler (2013), among others, but our system allows us to generalize to additional verbs and give these differences in interpretation a principled base in the syntax. Presuppositional verbs always take DPs and their interpretation is always the same, regardless of whether there happens to be a CP embedded in that DP.

Finally, the framework is applied to **sentential subjects**, which have been argued to be nominal since at least Rosenbaum (1967) and Ross (1967). Classifying sentential subjects as DPs predicts their extraction effects (the Sentential Subject Constraint) as well as their presupposed and factive nature, a proposal that is corroborated by a new crosslinguistic generalization: the same D that introduces an Overt Definite Presuppositional in languages such as Greek and Hebrew is required in order to introduce a sentential subject. The interpretation of sentential subjects is also predicted correctly.

Analysis-wise, the functional structure within the embedded clause is different for the three

types of clauses discussed here:

- Selected Embedded Non-presuppositionals (*think that* …) are CP complements to the verb: [$_{VP}$ V CP].
- Selected Embedded Presuppositionals (*regret/deny that* …) are DP complements to the verb, in which a semantically-sensitive determiner Δ selects CP: [$_{VP}$ V [$_{DP}$ Δ CP]].
- Overt Definite Presuppositionals (*the fact that* … in English, or *ze še-*… 'this that …' in Hebrew and other languages) are full DP complements to the verb, in which an adjunct CP modifies the noun: [$_{VP}$ V [$_{DP}$ D [$_{NP}$ [$_{NP}$ N] CP]]].

The claims made about each construction are summarized in Table 1.

Name	Structure	CP selected	Factive	Idiomatic
Selected Embedded Non-presuppositional	[V CP]	yes	no	no
Selected Embedded Presuppositional	[V [$_{DP}$ Δ CP]]	yes	yes	no
Overt Definite Presuppositional	[V [$_{DP}$ D [$_{NP}$ [$_{NP}$ N] CP]]]	no	yes	yes
Sentential Subject	[[$_{DP}$ DP CP] VP]	no	yes	yes

Table 1: Combinations of V, DP and CP examined in this paper.

We begin in section 2 by explaining our approach to presuppositional clauses and laying out the background for factivity as it is discussed in the literature. We then formalize our proposal, as summarized in Table 1 above. The following three sections tackle the empirical puzzles outlined above: the extraction facts (section 3), the fronting facts (section 4), and the *as/which* distinction (section 5). With this machinery in place we turn to new data, as section 6 extends the analysis to cover the interpretation distinctions for presuppositional and non-presuppositional verbs. Section 7 then shows how sentential subjects fit into the picture. Penultimate section 8 reviews some prominent existing analyses, arguing against their problematic aspects and discussing where they overlap with ours. Section 9 concludes with take-home messages on presupposition, embedding and selection, as well as avenues for future work. Throughout, the paper uses the term *presuppositional* interchangeably to refer to presuppositional predicates (*regretted*, *denied*) or to their clausal complements (*that he was late*).

2 Factivity and Presupposition

Various authors have tried to divide verbs into different classes based on factivity and referentiality, with the theoretical issue at hand being whether these classes correspond to anything in the grammar. In addition to the factivity/nonfactivity split in Kiparsky and Kiparsky (1970), an influential five-way typology was suggested by Hooper and Thompson (1973) and a three-way division was discussed by Cattell (1978); it is the latter that we will focus on here. With the concept of factivity established, a considerable literature began pointing to certain syntactic effects that were limited to either factive or nonfactive environments, to be reviewed and reframed as presuppositional or nonpresuppositional environments.

2.1 Presuppositional Verbs

In essence, factive predicates are adjectives or verbs that presuppose the truth of their argument: *regret*, *is significant*, *makes sense*, *bothers* and so on, contrasted with predicates such as

say, *think*, *is likely*, *is possible* and *appears*. See Hegarty (1990), Melvold (1991) and Sheehan and Hinzen (2011) for work building on the earlier models, but compare Simons (2007) for a view in which the pragmatics are more important than the actual predicate, and Giannakidou (1998, 1999, 2001) for a typology which considers the referentiality of predicates in order to answer questions about polarity.

We will limit our discussion to clausal complements of verbs (as opposed to adjectives, the selectional properties of which are a different matter. See Hartman 2012:36). The literature has mostly centered on factive verbs (Zubizarreta 1982; Adams 1985; Rooryck 1992; Abrusán 2011), but the correct class of verbs to consider is referential verbs writ large, or *presuppositional* in our terminology. This is the relevant breakdown (Cattell 1978):

(11) a. NON-STANCE (factive): *regret, know, remember, realize, notice*, etc.

b. RESPONSE STANCE: *deny, accept, agree, admit, confirm, verify*, etc.

c. VOLUNTEERED STANCE: *think, suppose, assume, claim, suspect*, etc.

NON-STANCE VERBS pattern together with RESPONSE STANCE VERBS to the exclusion of the non-presuppositional VOLUNTEERED STANCE VERBS (Hegarty 1990) with regards to the phenomena examined below—extraction (Szabolcsi and Zwarts 1997), fronting (Hooper and Thompson 1973; Heycock 2006) and nominalhood (Potts 2002).

The difference between non-stance and response stance verbs is as follows. Both are presuppositional, but the former are also factive. Accordingly, both classes of verbs presuppose the existence of their complement, but only the former presuppose the *truth* of their complement. The next subsection exemplifies.

2.2 Presuppositional Clauses

In order to recognize the basic difference between the three classes of verbs in (11), consider the following examples. A non-presuppositional verb like *say* can introduce a new idea. A presuppositional verb like *deny* can only refer to an already-existing notion. A factive (presuppositional) verb like *remember* can only refer to an already-existing notion which is also true.

(12) a. John said [that the moon was made of kale]. (No one had claimed that before.)

b. Bill denied [that he stole the cookies]. (# No one claimed that he had stolen them.)

c. #Bill remembers [that the moon is made of kale]. (# No one had told him this before.)

We use file change semantics (Heim 1982, 1983) to capture the difference between presuppositional and non-presuppositional clauses. In this theory, a discourse is conceptualized as a file containing different filecards. Each card corresponds to a discourse referent, and these referents make up the conversational common ground, CG (Stalnaker 1973, 1974; Lewis 1979). When one of the participants in the conversation brings up a certain individual, both interlocutors look up the relevant filecard. If the speaker makes a comment regarding that individual, the interlocutors update its filecard with the new information. If a speaker introduces a new discourse referent, the interlocutors create a new filecard and add it to the file.

Heim analyzes indefinite descriptions as introducing new discourse referents and creating new filecards. Definite descriptions, in contrast, refer to existing discourse referents qua filecards. Making a comment on an existing discourse referent is comparable to writing new information on the referent's filecard. What we would like to do here is think next about entire propositions as discourse referents. In the examples in (12) above, the non-presuppositional

verb *said* creates a new filecard and adds a new discourse referent to the CG, namely the novel claim that the moon is made of kale. This proposition need not have been uttered before. Contrast this with the behavior of *denied* and *remembers* in (12b–c). There, the verb takes as its complement a claim that exists in the CG. Someone had already alleged that Bill stole the cookies, otherwise (12b) would not be felicitious; one does not deny something that has not been alleged yet. Similarly, someone had already told Bill that the moon was made of kale in (12c). It is impossible to remember something than has not been said yet. As Honcoop (1998:167) puts it, verbs like *deny* "presuppose that their complements express assumptions or claims held by someone possibly other than the speaker which are part of the common ground."

Our intuition, then, is that presuppositional verbs select an existing filecard from the CG and update it, that their complement necessarily refers to an existing discourse referent. Accordingly, these verbs presuppose the existence of their clausal complements in the CG and if their complement does not exist in the CG, the result is ill-formed. We implement this by grounding it in the syntax: the clausal complement is itself part of a definite DP. This way, Heim's generalization about definite descriptions refering to existing discourse referents still holds. Under our analysis, these clausal complements are DPs which themselves embed CPs, rather than "ordinary" CPs. Non-presuppositional clausas are "ordinary" CPs. There is no reason to treat them as definite.[2]

Before we formalize the analysis, it is important to note that clauses can be made factive in a number of ways. As we have seen, some verbs are inherently factive, meaning that their complements cannot be negated:

(13) a. I **thought/claimed/suggested** that the building collapsed, but it didn't.

b. #I **regretted/remembered/knew** that the building collapsed, but it didn't.

Non-presuppositional clauses can be made factive by prefacing them with *the fact*. Utterances (14a–b) are non-presuppositional and can be denied, but (14c–d) cannot:

(14) a. I **explained** [that the building collapsed], but it didn't really.

b. I **explained** [that the building collapsed], but I was just making an excuse for being late.

c. #I **explained** [the fact that the building collapsed], but it didn't really.

d. #I **explained** [the fact that the building collapsed], but I was just making up an excuse for being late.

The same can be said for predicates like *predict* or *anticipate*, as their presuppositions covary with the form of their complements: [$_{CP}$ *that* …] in the (a) examples or [$_{DP}$ *the fact* [$_{CP}$ *that* …]] in the (b) examples.

(15) a. I **predicted** that the building would collapse, but it didn't.

b. #I **predicted** the fact that the building would collapse, but it didn't.

(16) a. I **anticipated** that the enemy would destroy the city, but he didn't.

b. #I **anticipated** the fact that the enemy would destroy the city, but he didn't.

It should not come as a surprise that the lexical item *fact* triggers factivity. Earlier analyses have even suggested that factive clauses are headed by a silent FACT element (Kiparsky and Kiparsky 1970; Kayne 2008), an idea we will later reject as it cannot account for the extraction or interpretation facts.

[2]Presuppositional clauses can be "fact-like objects" or "proposition-like objects" in the terminology of Asher (1993), who distinguishes the two by the latter's ability to be a gerund.

But let us now introduce data from Hebrew where and factivity is licensed by the proximal demonstrative *ze*, a functional element rather than a lexical item like *fact*.

(17) a. *hu* ***hisbir*** [*še-ha-binyan* *karas*] *(aval hu lo be'emet karas)*
he **explained** COMP-the-building collapsed but he NEG really collapsed
'He explained that the building collapsed (but it didn't)'

b. *hu* ***hisbir*** *et* [*ze* *še-ha-binyan* *karas*] (# *aval hu lo be'emet karas*)
he **explained** ACC this COMP-the-building collapsed but he NEG really collapsed
'He explained the fact that the building collapsed (# but it didn't)'

This behavior is not unique to Hebrew: Persian uses the proximal demonstrative *in* and Greek uses the definite article *to* (Roussou 1992). In American Sign Language, this presuppositionality is signaled by signing the relevant propositions or individuals in different spatial locations, the ASL equivalent of a determiner (Kastner and Davidson 2013). Notably, this determiner always seems to be definite or proximal, never indefinite or distal.

2.3 The Proposal

We break the data down into three separate constructions: Selected Embedded Non-presuppositionals, Selected Embedded Presuppositionals and Overt Definite Presuppositionals. The first corresponds to non-presuppositional environments, the second to presuppositional environments with a clausal complement to a presuppositional verb, and the last to presuppositional environments with an overt element such as *the fact* or Hebrew *ze* heading the embedded clause. Table 1 is reproduced here to anticipate the discussion.

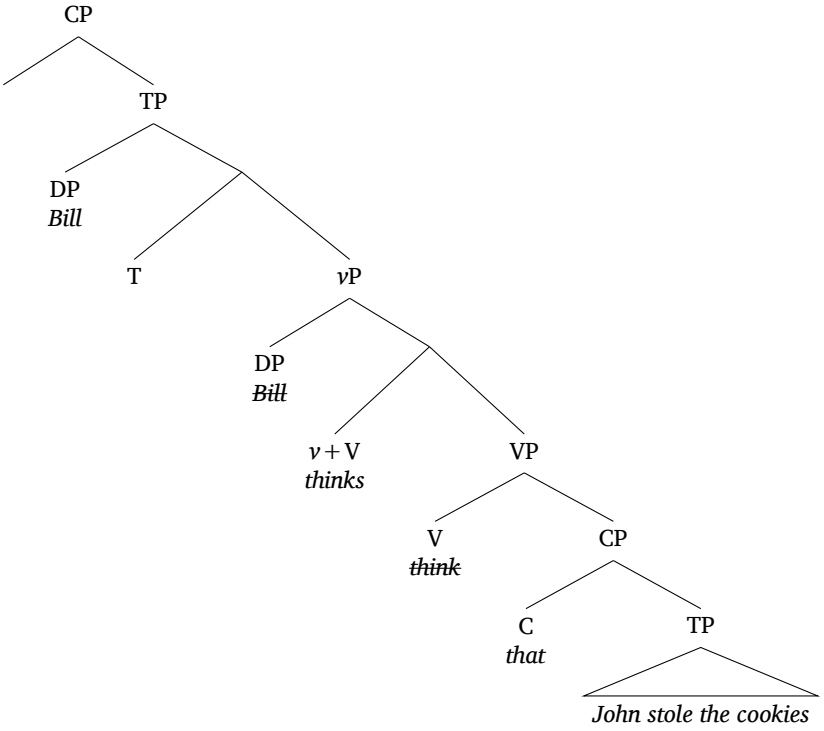
Name	Structure	CP selected	Presupposed	Idiomatic
Selected Embedded Nonpresuppositional	[V CP]	yes	no	no
Selected Embedded Presuppositional	[V [$_{DP}$ Δ CP]]	yes	yes	no
Overt Definite Presuppositional	[V [$_{DP}$ D [$_{NP}$ [$_{NP}$ N] CP]]]	no	yes	yes
Sentential Subject	[[$_{DP}$ DP CP] VP]	no	yes	yes

Table 2: Combinations of V, DP and CP examined in this paper.

2.3.1 Selected Embedded Non-presuppositionals

This group contains verbs that are not inherently presuppositional, such as *think* and *claim*, and which take a clausal complement. Under our analysis, the matrix verb selects for a proposition, i.e. a CP following the Canonical Structure Representation of Grimshaw (1981):

(18) *Bill thinks that John stole the cookies.*



(19) Selected Embedded Non-presuppositionals

- V selects for a proposition, CP.
- They are not presuppositional.

This is not to preclude non-presuppositional verbs from taking DP complements: *answer* may take a DP (a) or a CP (b), but the structure for (b) will be as in (18) above.

(20) a. The President answered [$_{DP}$ the question].

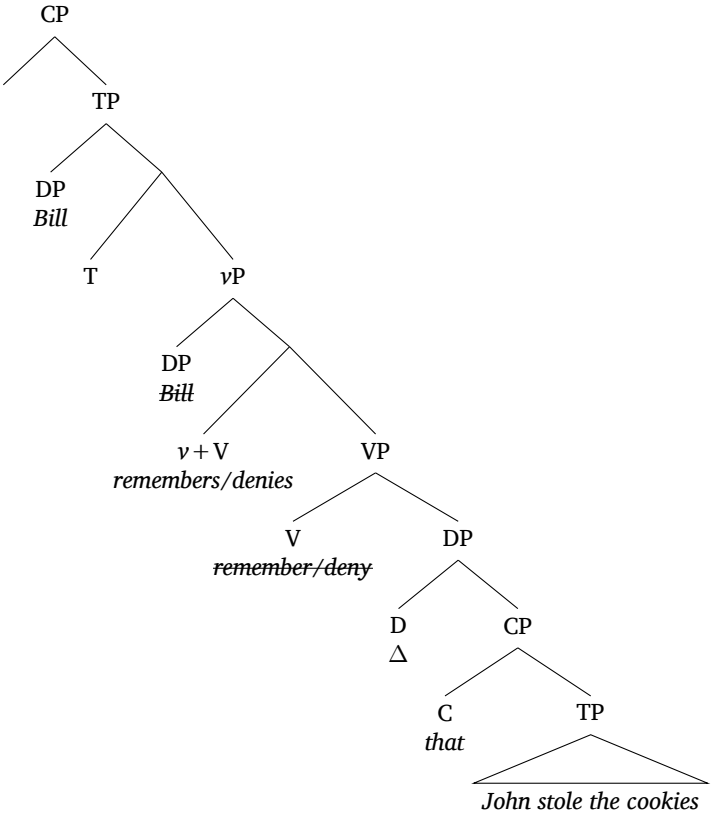
b. The President answered [$_{CP}$ that construction will go ahead as planned].

The next construction is the presuppositional counterpart of these verbs.

2.3.2 Selected Embedded Presuppositionals

This group contains predicates whose lexical semantics is inherently presuppositional, such as *remember*, *know*, *regret* and *deny*. These verbs appear as if they took a clausal complement, but we put forward that this is not actually the case; in our analysis they differ from their non-presuppositional counterparts by taking a definite DP. The matrix verb selects for a definite individual, which translates into subcategorization for a definite DP. We use a special symbol for the covert definite determiner, following Adger and Quer (2001): Δ. This determiner itself selects for a CP (proposition) as its complement.

(21) *Bill remembers/denies that John stole the cookies.*



The silent determiner is not a new idea in and of itself. In the semantics literature, Pelletier and Schubert (1989/2003) used a null determiner for mass nouns and Asher (1993:146) proposed a "silent *the*" to handle possession patterns. The only silent determiner that we know of to be strongly motivated in both the syntax and the semantics of embedded clauses is the one proposed in Adger and Quer (2001). That work is discussed in section 4 and that is where we borrow the Δ notation from.

(22) Selected Embedded Presuppositionals are definite elements:

- V selects for a semantically-sensitive definite D, namely Δ. This determiner, in turn, selects for a CP with a presuppositional Force head (see section 4).[3]
- They are presuppositional.

This is not to preclude presuppositional verbs from taking DP complements: *know* can take a DP (a) or a clausal complement (b), but the structure for (b) will be as in (21) above.

(23) a. The President knew [$_{DP}$ the answer].

b. The President knew [$_{DP}$ Δ [$_{CP}$ that construction will go ahead as planned]].

There is one more structure to consider, one in which a full DP is instantiated. We discuss it next.

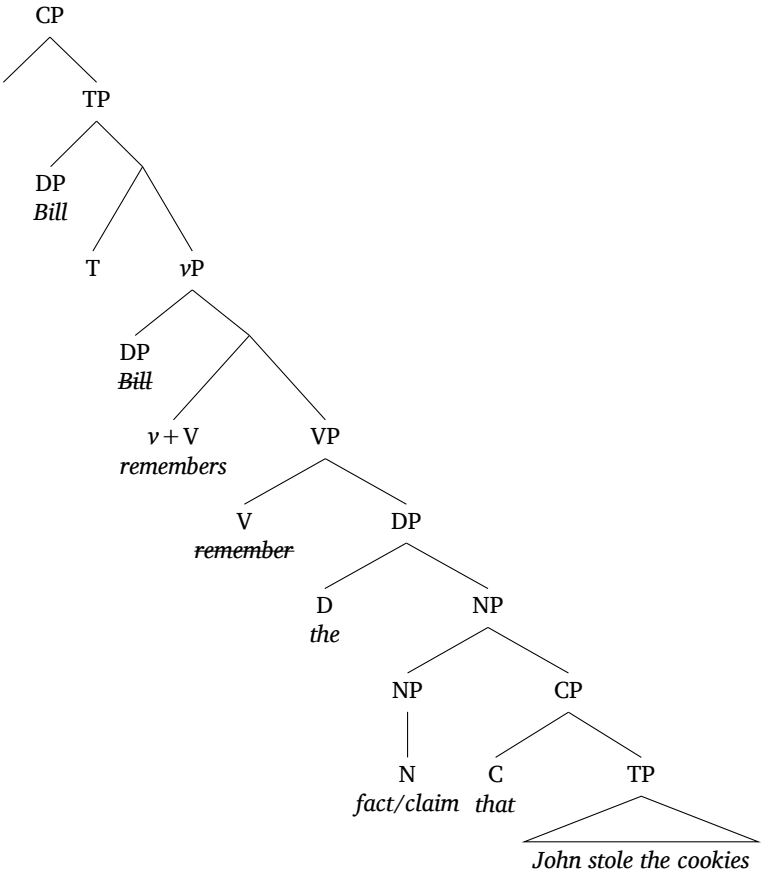
2.3.3 Overt Definite Presuppositionals

This group contains verbs that are followed by a clause headed by an overt determiner. Overt Definite Presuppositionals differ from Selected Embedded Presuppositionals in that the DP

[3] For a possible take on the semantics of [Δ CP], see Takahashi (2010:356ff14).

selected by the matrix predicate is a full DP with an NP layer (*the **fact** that*). The embedded clause is an adjunct modifying the noun phrase.[4] Here, too, the matrix verb selects for a presupposed individual, a DP.

(24) *Bill remembers the fact/claim that John stole the cookies.*



With this machinery in place, we will tackle the three puzzles mentioned above: extraction effects, fronting effects and the *as/which* contrast. After these three puzzles are tackled there will be two follow-up questions:

1. What is the difference in interpretation for the different kinds of elements selected by the matrix verb: Δ, DP, CP?
2. How do sentential subjects fit into the picture?

We address these issues one at a time.

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3 Extraction and Islandhood

There are two kinds of extraction facts to be accounted for. Movement out of Selected Embedded Presuppositionals is restricted: only certain complements can be extracted, not subjects or adjuncts. This is the weak islandhood puzzle, which we will solve by showing that our SEPs provide syntactic grounding for an existing semantic account. We have also introduced Overt Definite Presuppositionals. These are strong islands which prohibit any movement out of them.

[4] For a thorough account of the semantics of *that*-clause CPs adjoined to nouns, see Moulton (2009, 2013a,b).

We will account for this behavior by showing that ODPs are full DPs, thereby reducing their islandhood to the Complex NP Constraint.

3.1 Weak Islands: Extraction from Selected Embedded Presuppositionals

Extraction from non-presuppositional predicates like *think* is possible in ways that extraction from presuppositional predicates like *remember* is not, as can be seen in (25)-(26), adapted from Hegarty (1990); Basse (2008); Haegeman and Ürögdi (2010a). Only complements can be moved, direct objects or objects of prepositions.

(25) Extraction from nonpresuppositionals is generally allowed:

a. What do you **think** (that) John stole ___? COMPLEMENT

b. Where do you **think** John came from ___? COMPLEMENT

c. Who do you **think** ___ stole the cookies? SUBJECT

d. Why do you **think** that John stole the cookies ___? ADJUNCT

(26) Only complements can be extracted from presuppositionals:

a. What do you **remember/deny** that John stole ___?

b. Where do you **remember/deny** that John came from ___?

c. *Who do you **remember/deny** ___ stole the cookies?

d. #Why do you **remember/deny** that John stole the cookies ___?[5]

Generally speaking, even extraction of complements from presuppositionals may be degraded (examples adapted from Kluender and Kutas 1993:628):

(27) a. ?What did you figure out you will say ___ to your boss in the meeting?

b. ?Who did the senator figure out that they discovered ___?

(28) a. ?What did you figure out that you should tell your boss about ___ before the meeting?

b. ?Who did the senator figure out that they had discovered something about ___ in the press room?

This pattern obtains in other languages as well. Extraction from non-presuppositionals is allowed in Hebrew and Greek:

(29) HEBREW

a. *ma ata **xosev** še-dani ganav ___?*
what you **think** COMP-Danny stole
'What do you think that Danny stole?' COMPLEMENT

b. *mi ata **xosev** (še-) ___ ganav et ha-'ugiot?*
who you **think** COMP- stole ACC the-cookies
'Who do you think stole the cookies?' SUBJECT

c. *lama ata **xosev** še-dani ganav et ha-'ugiot ___?*
why you **think** COMP-Danny stole ACC the-cookies
'Why do you think Danny stole the cookies?' ADJUNCT

[5]Ungrammatical on the intended "low" reading.

(30) GREEK

a. *ti* ***nomizis*** *oti* *eklepse* ___ *o* *Janis?*
what **think**.2SG COMP stole.3SG the John
'What do you think that John stole?' COMPLEMENT

b. *pjos* ***nomizis*** *oti* ___ *eklepse* *ta* *biskota* *?*
who **think**.2SG COMP stole.3SG the biscuits
'Who do you think stole the biscuits?' SUBJECT

c. *jati* ***nomizis*** *oti* *o* *Janis* *eklepse* *ta* *biskota* ___*?*
why **think**.2SG COMP the John stole.3SG the biscuits
'Why do you think that John stole the cookies?' ADJUNCT

Extraction from Selected Embedded Presuppositionals is only allowed for complements in Hebrew, and is banned for some speakers of Greek:[6]

(31) HEBREW

a. *ma* *ata* ***zoxer*** *še-dani* *ganav* ___*?*
what you **remember** COMP-Danny stole
'What do you remember that Danny stole?' COMPLEMENT

b. *?*mi* *ata* ***zoxer*** (*še-*) ___ *ganav* *et* *ha-'ugiot?*
who you **remember** COMP- stole ACC the-cookies
(int. 'Who do you remember stole the cookies?') SUBJECT

c. *#lama* *ata* ***zoxer*** *še-dani* *ganav* *et* *ha-'ugiot* ___*?*
why you **remember** COMP-Danny stole ACC the-cookies
(int. 'Why do you remember that Danny stole the cookies?') ADJUNCT

(32) GREEK

a. *%ti* ***thimase*** *oti* *eklepse* ___ *o* *Janis?*
what **remember**.2SG COMP stole.3SG the John
(int. 'What do you remember that John stole?') COMPLEMENT

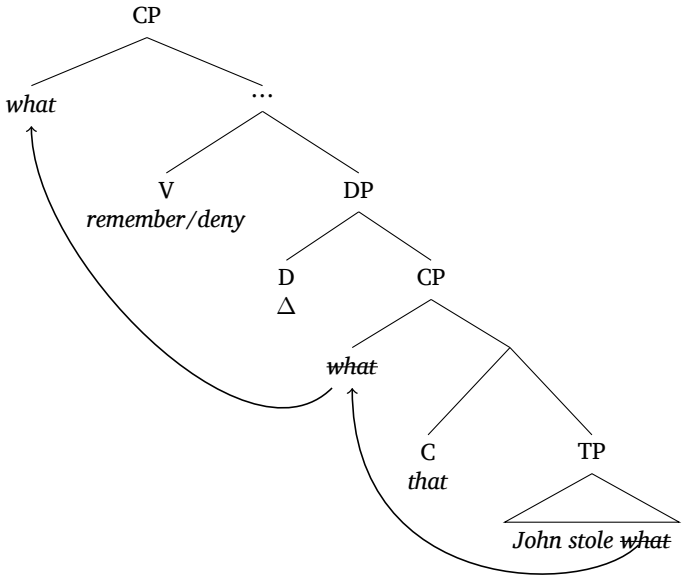
b. *?*pjos* ***thimase*** *oti* ___ *eklepse* *ta* *biskota* *?*
who **remember**.2SG COMP stole.3SG the biscuits
(int. 'Who do you remember stole the biscuits?') SUBJECT

c. *#jati* ***thimase*** *oti* *o* *Janis* *eklepse* *ta* *biskota* ___*?*
why **remember**.2SG COMP the John stole.3SG the biscuits
(int. 'Why do you remember that John stole the biscuits?') ADJUNCT

[6] Greek has two complementizers, the "factive" *pu* and "non-factive" *oti*. Some speakers allow extraction of complements out of presuppositional islands regardless of the complementizer, some allow extraction with *oti* and some disprefer it completely. For all speakers, the subjunctive particle *na* can be used to introduce a subjunctive clausal complement, out of which all extraction is possible. *Na* is obligatory for control verbs and other predicates, and optional with others. Full treatment of the Greek complementizer system lies beyond the scope of this paper. For discussion of the complementizers, see Roussou (1992, 2010). For related discussion of factivity, see e.g. Giannakidou (1998). For a broader discussion of C-drop in English and other languages, see Sheehan and Hinzen (2011) and references therein.

The syntactic literature has called the elements that block a certain kind of extraction weak islands (for an overview see Szabolcsi and den Dikken 1999). The kind of elements that can be extracted from weak islands are usually complements, rather than specifiers. [7] Recall our structure for Selected Embedded Presuppositionals, illustrating the extraction facts:

(33) *What do you remember/deny that John stole* ___?



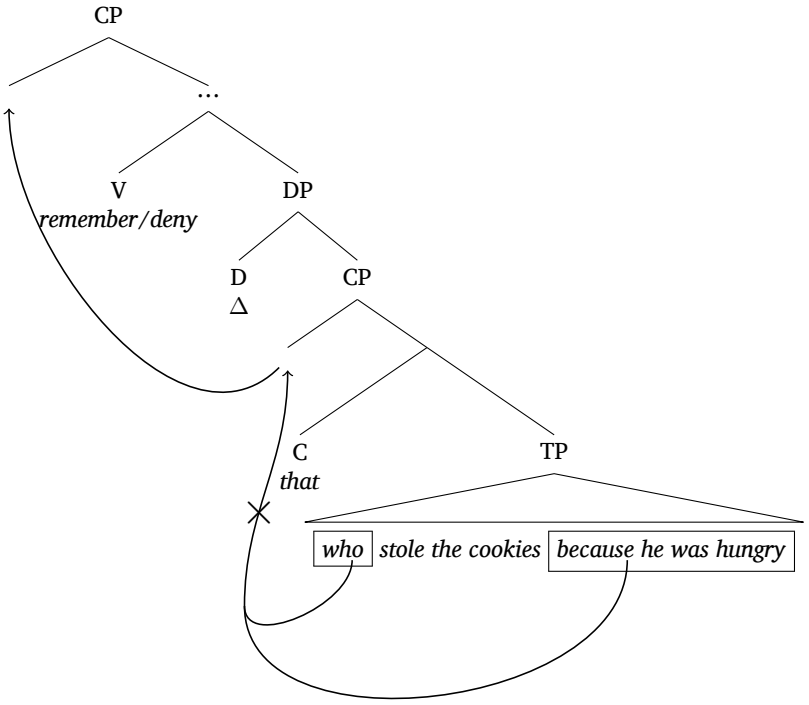
[7] Complements extract more easily than specifiers even in strong islands such as the Coordinate Structure Constraint of Ross (1967:168):

(i) **What** did you [[go to the store] and [buy ___]]? (Hofmeister and Sag 2010:370)

The traditional analyses of extraction rely on the complement being properly governed, reducing its behavior as described by the Condition on Extraction Domains (Huang 1982) to the Empty Category Principle. We will not attempt a Minimalist rethinking of Subjacency here, though see Müller (2010) and references therein for a few approaches.

(34) a. * *Who do you remember/deny (that) ___ stole the cookies?*

b. # *Why do you remember/deny (that) John stole the cookies ___?*



This is not to say that any complement can be extracted from a presuppositional island. Rather, Selected Embedded Presuppositionals pattern like other weak islands with regards to the kind of element that can be extracted:

(35) Complement extraction permitted ("ordinary" weak island):

a. Which man did you see ___?

b. Which man do you regret/deny that you saw ___?

(Szabolcsi and Zwarts 1997:223)

(36) Measure phrases with negation as an island, banning complement extraction:

a. * **How much milk** didn't you drink ___?

b. * **How much milk** don't you regret/deny that John drank ___?

(Szabolcsi and Zwarts 1997:224)

(37) 'One time only' predicates as an island, banning complement extraction:

a. Which relatives do you regret that you showed the ring to ___?

b. * Which relatives do you regret that you got this ring from ___?

(Szabolcsi and Zwarts 1997:251)

It has thus been the general view that presuppositional verbs are weak islands and that this is a semantic phenomenon (Szabolcsi and Zwarts 1997; Szabolcsi and den Dikken 1999; Abrusán 2011). The question is why. To answer this, we will invoke the account of weak islands proposed in Honcoop (1998) and show how it builds directly on the syntactic scaffolding given above.

3.1.1 Dynamic excursions

The argument in Honcoop (1998) goes as follows: dynamic semantics (e.g. Groenendijk and Stokhof (1991)) is based on updates to the CG. This allows for variable binding across utterance boundaries. However, this binding may be blocked by certain elements, rendering the to-be bound variable INACCESSIBLE. Honcoop's idea is that the same elements that intervene and disrupt this binding also cause weak island effects. Put otherwise, weak island effects arise because an intensional operator is unable to bind an indefinite.

In dynamic semantics, the scope of an existential operator can extend beyond the end of an utterance and onto the next one. This way, (38a) is not interpreted as (38b)—in which the final instance of the variable is not bound—but as (38c).

(38) a. A linguist came in. He sat down.

b. * $\exists x\,[\text{linguist}(x) \wedge \text{came-in}(x)] \wedge \text{sat-down}(x)$

c. $\exists x\,[\text{linguist}(x) \wedge \text{came-in}(x) \wedge \text{sat-down}(x)]$

Honcoop claims that the same operators that constitute weak islands intervene in anaphor binding, and that this is no coincidence. For example, negation blocks binding across clauses (39) and also induces weak island effects (40–41).

(39) Negation induces Inaccessability:

a. John saw a man$_i$. He$_i$ whistled.

b. *John **didn't** see a man$_i$. He$_i$ whistled.

(40) Negation induces weak islandhood in questions (Szabolcsi and Zwarts 1997):

a. How did John behave?

b. *How did**n't** John behave?

(41) Negation induces weak islandhood in *what-for* constructions (Honcoop 1998):

a. *Wat$_i$ heeft Jan voor een man$_i$ gezien?*
what has Jan for a man seen
'What kind of man did Jan see?' (Dutch)

b. **Wat$_i$ heeft Jan **niet** voor een man$_i$ gezien?*
what has Jan **not** for a man seen
'What kind of man didn't Jan see?' (Dutch)

Honcoop's insight is that the same intervention is happening in Inaccessability contexts (39) and in the weak island contexts (40–41), for a variety of operators beyond just negation. When an operator (such as a weak island) intervenes between a quantifier and the indefinite it binds (42), the result is ungrammaticality.

(42) The Intervention Generalization: (Honcoop 1998:19)
* Q_i [$_\phi$ …[$_{Weak\ Island}$ Operator …indefinite$_i$ …$_\phi$]]

The first part of Honcoop (1998) explains how binding is blocked in cases of *what-for* islands, negation islands, negative polarity licensors and *wh*-phrases. The bulk of the book is devoted to developing this idea in some detail. We will not go into the technical details here, because that would require us to introduce too much background on Dynamic Semantics and too much formal notation. See Barker (2002) for an accessible overview of the dissertation and Szabolcsi and den Dikken (1999) for a concise discussion of it in the context of islandhood. Instead, we will give an informal sketch of his analysis now and discuss the implementation further in section 3.1.2 and the consequences for us in section 3.1.3. For the full details see Honcoop (1998:ch. 4.6).

Volunteered stance verbs, response stance verbs and non-stance verbs all introduce embedded clauses. Because of this the prediction is that they are all intensional operators that should intervene between an indefinite and its anaphor. In other words, the prediction is that they should all be weak islands, contrary to fact. Honcoop takes some time working through why this is not the case, and concludes that an additional intensional operator produces a bindable variable. This operation is a version of existential closure, which happens precisely because non-presuppositional verbs create a new filecard. Presuppositional verbs do not, and hence are islands. His system relies on presuppositional verbs taking an existing discourse referent as their complement.

3.1.2 Existential Disclosure and Modal Subordination

Why presuppositional verbs are islands is straightforward on this account: they are intensional operators and, as such, block binding from the indefinite embedded in their CP. Why would non-presuppositionals verbs be exempt from this restriction?

According to Honcoop (1998), non-presuppositional verbs introduce the denotation of what is inside their complements as a new referent. In dynamic semantics terminology, uttering these CPs yields a change in our information-state. Introducing this referent requires an operation similar to existential closure. But this extra operation results in a new variable that can be bound, allowing the derivation to converge. It is the fact the non-presuppositional verbs introduce a new referent, whereas presuppositional verbs refer to an existing discourse referent, that feeds Honcoop's semantics.

Now, non-presuppositional verbs induce Inaccessability (43a), even though they do not induce weak islands (43b). Even more puzzling, the Inaccessability effect in (43a) disappears when a modal is used (43c). The generalization is that an additional operator, such as a *wh*-operator or a modal, allows binding of the pronoun to take place.

(43) Selected Embedded Non-presuppositional, modal subordination required:

a. *John thinks [that he has a$_i$ dollar in his wallet]. He will give it$_i$ to the beggar.
{x: John OP thinks [that he has a dollar$_x$ in his wallet]. He will give it$_x$ to the beggar }

b. What does John think that he has ___in his wallet?

c. John thinks [that he has a$_i$ dollar in his wallet]. He **wants** to give it$_i$ to the beggar.
{x: John OP thinks [that he has a dollar$_x$ in his wallet]$_j$. He OP$_j$ wants give it$_x$ to the beggar }

This is the result of two operations applying in succession. The first is Existential Disclosure, which had been proposed elsewhere for Dynamic Semantics (Dekker 1993, and see Szabolcsi and den Dikken 1999 for a brief rundown). Existential Disclosure basically turns an existential into a property, and is needed independently in the dynamic semantics system in order to allow indefinites to scope across clause boundaries. It "discloses" the identity of the indefinite.

(44) EXISTENTIAL DISCLOSURE: discloses the identity x of the indefinite i, such that $x = i$. *There exists x* becomes the property {x: indefinite$_i$ and it$_i$ is identical to x}

a. There exists a new coat.

b. {x: there exists a new coat$_i$ and it$_i$ is identical to x}

c. {x: x is a new coat}

What Existential Disclosure does is take an existential that has just been introduced and render it bindable.

The second dynamic semantic mechanism that applies is called Modal Subordination (Groenendijk and Stokhof 1989). All that Modal Subordination says is that the restrictor of the modal is a null anaphor. Like any anaphor, this one needs an antecedent. In the case we are considering, this anaphor "picks up" the new discourse referent introduced by the indefinite, the clause [*that he has a dollar*$_x$ *in his wallet*]$_j$ in (43c). The indefinite *a dollar* is then able to bind the pronoun *it*.

To sum up, once an indefinite is introduced, Existential Disclosure applies. A modal can then bind this indefinite. Now, if non-presuppositional verbs can do this, why can't presuppositionals? Honcoop's answer is that presuppositionals do not introduce a new discourse referent, which means that Existential Disclosure does not get a chance to kick in. Given that Existential Disclosure feeds Modal Subordination, the latter cannot apply either. Honcoop (1998:179) himself invokes the analogy to definite and indefinite descriptions, though he does not go so far as to postulate a definite DP in the syntax. His account is completely asyntactic. [8]

3.1.3 Deriving presuppositional islands

Honcoop (1998) tried to equate weak islands with constraints on inter-clausal binding of indefinites in dynamic semantics. For this to work with presuppositional islands, he needed to assume that presuppositional verbs do not introduce a new discourse referent as their complement. These verbs thus serve as interveners for the binding of an anaphor. Non-presuppositional verbs do not face this problem. They create a new filecard, triggering Existential Disclosure. The result is that there is a bindable pronoun, and in those environments where another operator appears—such as modal contexts or A'-movement—an operation called Modal Subordination alleviates the intervention effect.

We are glossing over many details here, to be sure. For example, we use Heim's file change semantics, but there are differences between how dynamic semantics treats indefinites and how Dynamic Montague Semantics of the kind adopted by Honcoop treats them. Again, see the work cited for the full implementation and much discussion.

Honcoop's system goes beyond the preliminary suggestions in Szabolcsi and Zwarts (1997) and makes strong predictions which seem to be correct. For this system to work, he needs the complement of a non-presuppositional verb to introduce a new referent and the complement of a presuppositional verb to be an existing discourse referent. This is compatible with the theory we have been working out so far. If the semantics interprets the structure generated by the syntax, our theory gives the analysis in Honcoop (1998) a principled basis. What he must assume, our theory gives for free: a definite DP as the complement of a presuppositional verb and a CP as the complement of a non-presuppositional verb. The denotations Honcoop came up with are not longer stipulations but a direct interpretation of syntactic structure.

This is reminiscent of Diesing's (1992) account of extraction from indefinite noun phrases. Diesing made a distinction between presuppositional indefinites and "cardinal" indefinites. The former undergo obligatory QR and disallow extraction. The latter induce existential closure, remain in situ and allow extraction. At least superficially, her approach and Honcoop's

[8] The story is actually more complicated than this. Honcoop's full analysis has to contend with contrasts such as the following, which do not pattern along the presupposition/non-presuppositional split (adapted from Honcoop 1998:168). See chapters 4.6.2–4.6.4 of his book for discussion.

(i) a. *John **thought** [that he met a$_i$ supermodel yesterday]. She$_i$ smiled at him.

b. *John **denied** [that he met a$_i$ supermodel yesterday]. She$_i$ smiled at him.

c. John **forgot** [that he met a$_i$ supermodel yesterday]. She$_i$ smiled at him.

share a number of similarities in that a certain nominal element triggers an additional scopal process which blocks extraction, but we will not pursue the comparison between the two.

3.2 Strong Islands: Extraction from Overt Definite Presuppositionals

Let us add a final class of presuppositional clauses to the island mix. These are the clauses that are prefaced by an overt DP; we dubbed them Overt Definite Presuppositionals since they are prefaced by the overt string *the fact that* in English but by an overt determiner in various other languages. No extraction is possible from them:

(45) ENGLISH

a. * *What do you remember* ***the fact/claim*** *that John stole ___?*

b. * *Who do you remember* ***the fact/claim*** *that ___ stole the cookies?*

c. # *Why do you remember* ***the fact/claim*** *that John stole the cookies ___?*

(46) HEBREW

a. * *ma ata zoxer et* ***ze*** *še-dani ganav ___?*
what you remember ACC **this** COMP-Danny stole
(int. 'What do you remember the fact that Danny stole?')

b. * *mi ata zoxer et* ***ze*** *še-___ ganav et ha-ugiot?*
who you remember ACC **this** COMP stole ACC the-cookies
(int. 'Who do you remember the fact that stole the cookies?')

c. # *lama ata zoxer et* ***ze*** *še-dani ganav et ha-ugiot?*
why you remember ACC **this** COMP-Danny stole ACC the-cookies
(int. 'Why do you remember the fact that Danny stole the cookies?')

(47) GREEK

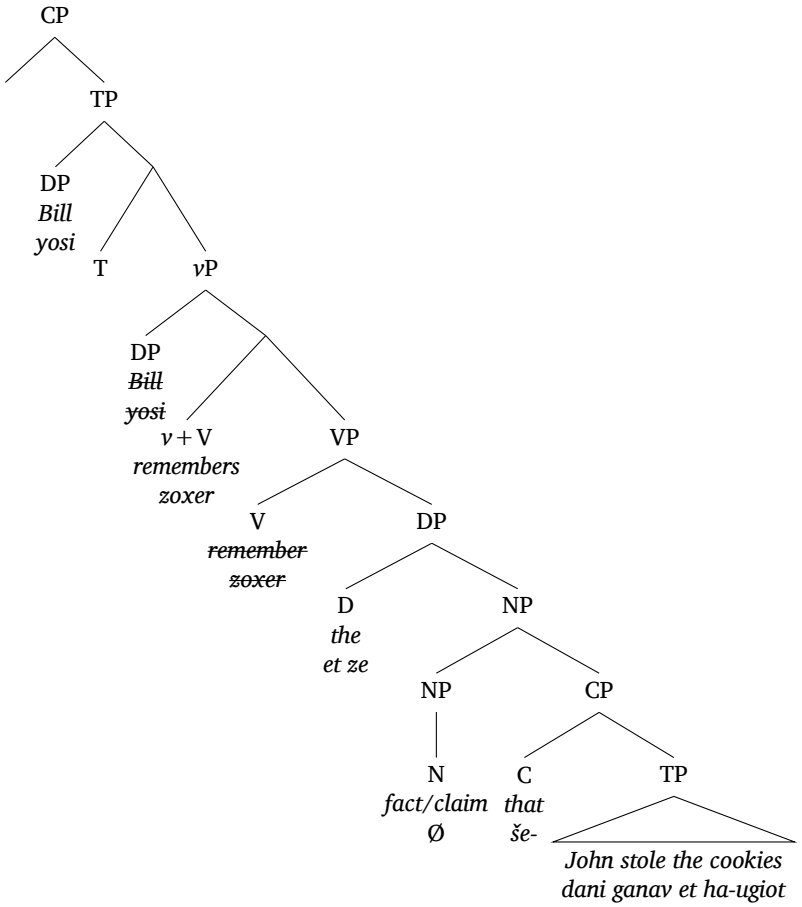
a. * *ti thimase* ***to*** *oti eklepse ___ o Janis?*
what remember.2SG **the** COMP stole.3SG the John
(int. 'What do you remember the fact that John stole?')

b. * *pjos thimase* ***to*** *oti ___ eklepse ta biskota?*
who remember.2SG **the** COMP stole.3SG the biscuits
(int. 'Who do you remember the fact that stole the biscuits?')

c. * *jati thimase* ***to*** *oti o Janis eklepse ta biskota?*
why remember.2SG **the** COMP the John stole.3SG the biscuits
(int. 'Why do you remember the fact that John stole the biscuits?')

Under our analysis, the embedded CP is adjoined to a noun inside a DP. The tree in (48) is repeated from (24), with Hebrew lexical items added below the English ones.

(48) *Bill remembers the fact/claim that John stole the cookies.*



Ross (1967) noted that extraction from an adjunct clause or a Complex NP is blocked. This is the situation we are faced with here: none of the elements in the embedded clause can be extracted, since they are part of an adjunct clause/complex NP.[9]

4 Fronting

The next phenomenon that has been brought up in the context of factivity, referentiality and presupposition is argument fronting. Fronting is taken here as representative of Main Clause Phenomena, a topic of much work in the earlier days of transformational grammar (Emonds 1970; Hooper and Thompson 1973; Green 1976); see Heycock (2006) for a recent review. The question is why fronting is generally allowed in nonpresuppositionals but disallowed in presuppositionals (Maki et al. 1999; Basse 2008; Bentzen 2010; Haegeman and Ürögdi 2010a:112).

[9] An anonymous reviewer suggests the following emergent typology of islands:

1. Indefinite D + N (indefinite DP): weak island
2. Definite D + N ("full", definite DP): strong island
3. Definite D with no (Selected Embedded Presuppositional): weak island

This is an intriguing idea. If it is on the right track, it might be worth considering the role of both D and N as intensional operators in the sense of Honcoop (1998).

(49) Argument fronting in nonpresuppositionals, grammatical:

a. John **thinks** that [this book, Mary read].

b. I can **assure** you that [that film, I don't want to ever see again].

c. That film, I don't ever want to see again.

(50) Argument fronting in presuppositionals, ungrammatical:

a. *John **regrets/denies** that [this book, Mary read].

b. *John **regretted/denied** that [Gone with the wind he never went to see].

While not all speakers we have consulted agree that the judgments are as clear-cut, they do all find a contrast in acceptability between the likes of (49) and (50). Additional examples can be found in the works cited above.

In an important early study of Main Clause Phenomena, Hooper and Thompson (1973) suggested that ungrammaticality arises in clauses that do not make an **assertion**: "*emphasis would be unacceptable in clauses that are not asserted, e.g. embedded clauses which are presupposed*" (Hooper and Thompson 1973:472).

The strong form of this semantic-pragmatic hypothesis has since been challenged (Green 1976; Heycock 2006): example (51) presents a non-asserted embedded clause with a fronted element, while example (52) shows the presuppositional verb *regret*, a non-assertive verb, embedding a cleft (another form of emphasis).

(51) I get very upset if I go into my sewing room, and out of the closet pops your boyfriend. (Green 1976:390)

(52) We **regretted** that [it was precisely this book that had been destroyed]. (Heycock 2006)

Although a strong semantic hypothesis like that of Hooper and Thompson (1973) can be ruled out, the idea is not without merit. Pointing out something that already exists is arguably a limited kind of conversational move. But unlike this earlier work, we need not say that presuppositional utterances are not conversational moves at all. In our view of the CG, presuppositional utterances can still update existing filecards. In our solution, once again, a definite structure generated by the syntax will feed semantic effects (in this case topicalization and focus). To do this we must first set up a system in which a matrix verb can place requirements on the embedded clause. We will borrow two components from Adger and Quer (2001). The first is the interaction of embedding V, embedded D and embedded C. The second is the notation for said D.

4.1 Selection in Selected Embedded Presuppositionals

What is the nature of the relationship between the verb, Δ and C? We say that Δ requires a CP complement, but what does such a relationship between a determiner and a complementizer entail? We will adopt an answer from the work of Adger and Quer (2001) and see that implementing it in our theory gives us exactly the right kind of control over the left periphery of the embedded clause: the presuppositional verb selects a presuppositional determiner, which in turn selects a C/Force (or Fin) that constrains the availability of Topic and Focus in its clause.

Consider our classification of predicates. We have maintained that presuppositional predicates embed a definite description which refers to a discourse referent in the CG. The definiteness in the definite description is the result of an embedded definite determiner that we label Δ. In other words, Δ is a definite D that picks out a unique proposition which the speaker can

take a RESPONSE STANCE on or refer to with NO STANCE, in the terminology of Cattell (1978); it is presuppositional.

The relevance of Adger and Quer (2001) lies in that it presents a formal system for reading semantic effects off the syntax of embedded clauses. Adger and Quer investigated what they termed **unselected embedded questions** (UEQs), roughly meaning *if*-clauses embedded under proposition-selecting predicates like *tell* (in juxtaposition to **selected** embedded questions that are selected by predicates such as *ask*). It turns out that whereas *whether*-clauses are fine with such predicates (53a), UEQs sound odd to some speakers and ungrammatical to others (53b):

(53) a. The bartender told me whether I was drunk.

b. %The bartender told me if I was drunk.

Adger and Quer uncovered two generalizations. One, that UEQs are fine in downward-entailing environments, behaving in effect like polarity sensitive items.

(54) Questions and negation:

a. **Did** Julie admit/hear/say if/that the bartender was happy?

b. Julie **didn't** admit/hear/say if/that the bartender was happy.

Two, that certain predicates simply cannot embed UEQs. These are "true-false" predicates (Ginzburg 1995), predicates that "*signal the subject's epistemic commitment to the truth or falsity of the embedded proposition*" (Adger and Quer 2001:110) – i.e. a STANCE. Such predicates cannot embed a question since a question has no inherent epistemic commitment. Importantly for our purposes, the choice of complementizer—*that* or *if* depends on the matrix verb. The examples are adapted from Adger and Quer (2001:110):

(55) a. Julie claimed/assumed/maintained that/*if the bartender was happy.

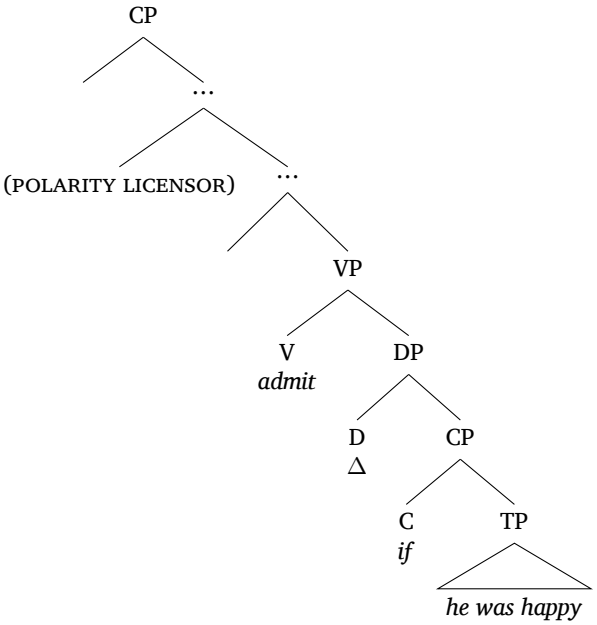
b. Did Julie claim/assume/maintain that/*if the bartender was happy?

c. Julie didn't claim/assume/maintain that/*if the bartender was happy.

The two generalizations imply that a relationship holds between the matrix verb and the embedded clause. First, the polarity facts (54) imply that licensing is involved, since polarity items must be licensed by a higher element. Second, the sensitivity to certain kinds of verbs (55) implies that selection is involved. Adger and Quer (2001) analyze these patterns using a semantically sensitive functional head above the CP, namely the determiner Δ. This determiner might be overt in some languages. Data from Basque shows that this language has a complementizer-like element sensitive to the type of clause it introduces. This element can be morphologically decomposed into a D + C complex, meaning that the combinination of a polar determiner and a CP results in a UEQ in Basque (Adger and Quer 2001:117). The authors extend this idea to English, proposing that in English the Δ is covert but that it interacts with the matrix predicate above it and with the C below it (*if/whether/that*), bridging the two.

This proposal accounts for the way that the meaning of an embedded question interacts with the matrix predicate; in other words, the [V-D-C] spine mediates the relation between the matrix verb and the embedded clause. V imposes a selectional restriction, selecting the polarity-sensitive determiner Δ ,which selects for the appropriate C.

(56) Adger and Quer (2001:118), adapted:



What if the matrix context is not downward-entailing or polarity-sensitive, though, but presuppositional? In this case a Δ will be licensed that is sensitive to presupposition. This kind of determiner is a definite determiner. That is the account defended here. The verb licenses the semantically-sensitive Δ. The exponent of its C complement is restricted by the semantics of that higher licensor (Adger and Quer 2001:118).

Combining the analysis in this paper with that of Adger and Quer (2001) accounts for a large amount of data crosslinguistically. Their paper makes no claims with regards to declarative embedded clauses, which is where our analysis steps in: when the context is presuppositional, our theory generates Selected Embedded Presuppositionals. The consequences of C being constrained by presupposition and definiteness will serve to explain the fronting facts.

An anonymous reviewer inquires as to the resulting typology of deltas. In principle, a D head can be sensitive to any number of features. Languages such as German have determiners whose form depends on definiteness, number, gender and case, all at the same time. The reason we use the notation Δ is in order to emphasize that this determiner is sensitive to semantic features. In the case of UEQs, these are polarity and truth/falseness. In the case of presupposition, the feature is definiteness. As we have seen above, the different environments might overlap. In (57), presupposition and downward-entailment are both present:

(57) Did Julie {admit/deny} / {say/think} Δ that the bartender was happy?

4.2 Fronting in Selected Embedded Presuppositionals

Let us revisit the premise that there is something different about the illocutionary force of presuppositional clauses (Hooper and Thompson 1973). A number of authors have recently tried to implement this in terms of a reduced left periphery (Basse 2008; Haegeman and Ürögdi 2010a). In his original description of the expanded left periphery, Rizzi suggested that "*It is reasonable to assume that the topic-focus system is present in a structure only if "needed", i.e. when a constituent bears topic or focus features to be sanctioned by a Spec-head criterion.*" (Rizzi 1997:288)

We propose that the Topic and Focus projections are not present in Selected Embedded Presuppositionals, leaving would-be fronted elements with no landing site. Force is supposed to be sensitive to the discourse environment of both the matrix predicate and the embedded

predicate – that is the original idea behind the left periphery as mediator between "high" and "low" structure. Force licenses Topic and Focus, so it stands to reason that they are sensitive to certain features on it. Now, the presuppositional embedding verb would carry a feature [F] relevant to presupposition; such a feature has been proposed before, though at this point it is not crucial whether it is [-ASSERT] (de Cuba 2007; Basse 2008), [+FACTIVE] or [+REFERENTIAL] (Haegeman and Ürögdi 2010a). The end result is the same: after V checks this feature on Δ, the determiner imposes a selectional requirement on Force similar to that which takes place in UEQs. Δ licenses a presuppositional Force, and a presuppositional Force does not license Topic or Focus.[10]

It can now be shown that this account not only prohibits fronting of the kind we want to ban, it also permits examples (51)-(52) seen above and repeated here. These were cases of emphasis in non-asserted clauses, judged to be impossible on a strong semantic-pragmatic view:

(58) I get very upset if [I go into my sewing room, and [out of the closet pops your boyfriend]].

(59) We **regretted** that [it was precisely this book that had been destroyed].

Example (58) presents a conditional construction. Our analysis has made no predictions here since there is no presuppositional verb to contend with. The system developed here has no reason to ban fronting in this kind of data.

Example (59) includes a cleft construction, *It is* α *that* β (α being the clefted element and β the restrictor clause), embedded under the presuppositional verb *regret*. It could be claimed that *it was precisely this book* is fronted, a situation that should be banned in our framework. Our approach to this is simple: there was never any fronting in (59b) to begin with.

Put briefly, the main question in the syntax of cleftsis whether the construction is derived via "extraposition" across the clefted element or whether an expletive is inserted clause-initially. Percus (1997) is a proponent of the "extraposition" approach, and he analyzes (60) as derived in (61) with the restrctor extraposed to the right of the clefted element. Under this view β starts off high and α low. The element β then extraposes to the right of α. Other researchers (e.g. Chomsky 1977, and see Spector 2012 for an instructive overview) have preferred the "expletive" approach and analyze clefts as in (62). In this case, the clefted element is indeed fronted but in a lower clause. It only raises as high as the complement of T in the larger embedded clause. The expletive *it* is base-generated as subject.

(60) It is **John** that Mary saw.

(61) An extraposition analysis.

a. [The Ø OP$_i$ that Mary saw t$_i$]$_j$ [$_{VP}$ t$_j$ is John].

b. [The Ø OP$_i$ ~~that Mary saw t$_i$~~]$_j$ [$_{VP}$ t$_j$ is John] [that Mary saw t$_i$].

c. [*The Ø t*] $\Rightarrow$ [*It*]

d. [It] [is John] [that Mary saw].

(62) An expletive analysis.

a. [$_{TP}$ It [is [$_{CP}$ that Mary saw John]]].

b. [$_{TP}$ It [is [$_{FP}$ John$_i$ [$_{CP}$ that Mary saw t$_i$]]]].

[10] Alternatively, Δ may select for Fin directly, skipping the Topic and Focus projections and depriving the embedded clause of all illocutionary force. This would be more in line with the referentiality treatment of non-assertive clauses proposed by Haegeman and Ürögdi (2010a) while avoiding some complications inherent in their system. We return to those in section 8.4.

On either account, the clefted element is not fronted to the left periphery of the largest embedded clause, that which is introduced by *regret*. Either analysis of clefts is compatible with our system, which is why it allows example (59) even though it bans fronting. This completes our account of fronting in Selected Embedded Presuppositionals, which uses the same building blocks as our account of extraction. The next empirical phenomenon will utilize the same toolkit.

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5 Clauses as Entities

If Selected Embedded Non-presuppositionals are CPs and Selected Embedded Presuppositionals are DPs, we would expect the latter to be more "DP-like" than the former. We will argue that this is so, the main argument coming from anaphoric forms like *so* and *as*.

First, though, we can try a basic diagnostic for phrasehood: coordination. In the earlier days of transformational grammar it was thought that only phrases of the same kind can be coordinated (Chomsky 1957). This constraint explained why the example in (63) is ungrammatical: it is not possible to combine the adverb *beautifully* with the DP *a carol*.

(63) John sang beautifully and a carol. (Peterson 1981, cited in Sag et al. 1985)

If we take this test at face value, we find a contrast between the impossible coordination of a CP and DP in non-presuppositionals on the one hand (64a) and what may be analyzed as coordination of two DPs in presuppositionals, on the other (64b).

(64) a. *John claimed [$_{CP}$ that the building collapsed] and [$_{DP}$ responsibility].

b. ?John denied [$_{DP}$ Δ that the building collapsed] and [$_{DP}$ the allegations].

Coordination is no longer considered a watertight diagnostic (Sag et al. 1985), but it is suggestive. Instead, let us try and replace the embedded structure with a pro-form. Raising verbs such as *seem* do not take DP complements, only CP complements. But they can take *so* as their complement, indicating that *so* stands in for a CP (Stowell 1987; Moulton 2009:288):

(65) a. It seems [$_{CP}$ so].

b. *[$_{DP}$ That] seems.

c. [$_{CP}$ So] it seems.

As also patterns with CPs, rather than DPs (Postal 1994; Potts 2002; Moulton 2009:288):

(66) a. Albert boasted/commented/complained [$_{CP}$ that the results were fantastic].

b. *Albert boasted/commented/complained [$_{DP}$ that/it/a belief that the results were fantastic].

c. The results were fantastic, **as** Albert boasted/commented/complained [$_{CP}$ ___].

Based on this work, we adopt the notion that *so* and *as* are pro-forms for clauses in English. The relevant pro-form for DPs will be *which* (Potts 2002). The question is, do we see a difference between the two classes of verbs with regards to the kind of pro-forms they license? If Selected Embedded Presuppositionals are DPs and Selected Embedded Non-presuppositionals are CPs, only the latter should license *so*. This appears to be true:

(67) a. John thought/said [$_{CP}$ so].

b. *John remembered/forgot [$_{DP}$ so].

The contrast between *as* and *which* also brings out this contrast. Potts (2002) discusses the difference between anaphoric *as* and anaphoric *which*. Following Ross (1984:258), he shows that *know* and *realize* embed both DPs and CPs, either of which can be extracted (68)–(69). But

Potts does not frame this generalization in terms of the verb classes involved. If we consider non-presuppositional verbs, the prediction is that only the CP-form *as* can be used, not the DP-form *which*. This is because the complement of Selected Embedded Non-presuppositionals is not a DP. Our prediction is borne out in (70–71).

(68) a. [Americans should get cheap oil], as the whole world **knows** ___. (CP)

b. [Americans should get cheap oil], which the whole world **knows** ___. (DP)

(69) a. This mist can't last, as Morpho and Hoppy (both) **realize** ___. (CP)

b. This mist can't last, which Morpho and Hoppy (both) **realize** ___. (DP)

(70) a. [Americans should get cheap oil], as the whole world **says/claims** ___. (CP)

b. *[Americans should get cheap oil], which the whole world **says/claims** ___. (DP)

(71) a. This mist can't last, as Morpho and Hoppy (both) **claim/announce/ think** ___. (CP)

b. *This mist can't last, which Morpho and Hoppy (both) **claim/announce/ think** ___. (DP)

See Han (2005) for similar examples. If presuppositional verbs take a DP immediately embedding a CP, and non-presuppositional verbs take only a CP, these facts can be explained easily. The observation, that verbs like *know* and *realize* involve some kind of nominalization of their clausal complement, did not escape Potts. He uses a nominalization operator $\cap^p$ in his analysis, a function from propositions to entities (a type-shifter). Hopefully it is clear by now that an abstract operator is not necessary: an actual syntactic element, the definite determiner Δ, leads to the same results. The problem with the analysis in Potts (2002) is that it does not constrain where the nominalization operator can be used, save for the restriction that $\cap^p$ can only apply to full clauses and some verbs (Potts 2002:77). Under our analysis, the use of Δ is constrained: only certain verbs license it, and these verbs do take nominals as their complements. As in the previous cases, what was previously a semantic stipulation can be derived straightforwardly from the syntax.

Moreover, Potts (2002:71) notes that "topicalized CPs leave nominal gaps", as in (72a). But that might not be the whole story. Topics are necessarily in the CG, by definition. Recall that volunteered stance verbs such as *boast* create a new filecard – they add a new discourse referent to the CG. What is happening is that these volunteered-stance verbs cannot refer to an existing filecard and so their complements cannot be topicalized (72b). In contrast, presuppositional verbs take a conversational topic (filecard, discourse referent) as their complement and an existing discourse referent may be topicalized (72c).

(72) a. *That the results were fantastic, Albert boasted ___.

b. *That the results were fantastic, Albert claimed/commented/thought ___.

c. That the results were fantastic, Albert denied/confirmed/knows ___.

5.1 Interim Summary

Section 3 presented the extraction puzzle, which we analyzed as extraction from islands: Selected Embedded Presuppositionals are weak islands, since the existential presupposition of a discourse referent gives rise to a weak island (Honcoop 1998). Overt Definite Presuppositionals do not allow any extraction since they are complex NPs as in Ross (1967).

Section 4 summarized the debate on fronting in factive clauses. Previous work has suggested that the solution cannot be entirely semantic, and our proposal implemented this as a selectional restriction of the embedding verb and the definite determiner.

Section 5 provided additional evidence that Selected Embedded Presuppositionals are DPs whereas Selected Embedded Non-presuppositionals are CPs, based on the pro-forms they license.

With our new typology of embedded clauses in place we have solutions to these three existing puzzles. But we are only halfway through; introducing new data, we can go one step further and ask what influence the selection of a DP or a CP has on the interpretation of the sentence. We turn to this next.

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6 Interpretation and Selection

Now that we have a clearer view of presupposition, we may take a step back and consider the broader picture of embedded clause selection and interpretation. What happens when other verbs take definite DPs – do they become presuppositional? Is there a difference between selecting for an individual and selecting for a proposition? If so, what is the division of labor between the syntax and the lexical semantics? This section will argue that DP complements can be interpreted differently from CP complements of the same verb.

It has been noted that clausal complements have different interpretations from DP complements, serving more as appositions than actual arguments (Higgins 1972; Stowell 1981; Moulton 2009).

(73) a. I explained [$_{DP}$ the problem] ≈ I EXPLAINED WHY X

b. I explained [$_{DP}$ the procedure] ≈ I EXPLAINED HOW TO DO X

c. I explained [$_{CP}$ that there was a problem] ≈ I SAID X AS EXPLANATION

d. I explained [$_{CP}$ that my car broke down] ≈ I SAID X AS EXPLANATION

The different meanings of *explain* can be brought out by adding different continuations:

(74) a. He **explained** [$_{DP}$ the building's collapse].
…The contractor was a crook, the building supplies were bought cheap and safety regulations were flaunted.)

b. He **explained** [$_{CP}$ that the building collapsed].
…and that's why the police closed off the street.

Our claim here is that the meaning of complements varies in a semi-predictable way, depending on the predicate. It **varies** because the DP-object and the CP-object mean different things. It is **predictable** because the CP version will always be this kind of apposition to a general case of the verb. It is **semi-predictable** because the exact interpretation will depend on the lexical semantics of the verb. We restrict ourselves to discussion of finite clauses, though it seems to us that the analysis can be extended to nonfinite CPs just as well. We will flesh out the details and then verify that presupposition reflects the differences in interpretation.

6.1 Selecting Individuals and Selecting Propositions

To see how this works let us take *explain* as a case in point. Our working hypothesis is that a verb can select for a DP or a CP (among other categories), following intensive work on S-selection and C-selection (Grimshaw 1979, 1981; Pesetsky 1982, 1992, 1993; Rothstein 1992; Odijk 1997). Some predicates can take either an individual (DP) or a proposition (CP) with no

substantial difference in meaning. That is, both sentences in (75) assert that the speaker said something to a third person. In this regard they are truth-conditionally equivalent:

(75) a. I told him [$_{DP}$ the time].
'I SAID X'

b. ≈ I told him [$_{CP}$ that he was late].
'I SAID X'

The situation is more complex for verbs like *explain*. The meaning of [*explain* Obj] covaries with the form of Obj, with a DP object meaning 'explain why' or 'explain how' and a CP object meaning 'say as explanation' (73). The CP object of *explain* is denotationally similar to the CP object of other verbs like *say* or *wish*: it is the content of what is explained, said or wished. Moulton (2013b:274) similarly suggests that the CP complement of a noun "identifies the content of the head noun."

The DP object is free to vary according to the idiosyncrasies of the V-DP relationship, such that different objects entail different readings of the verb (Marantz 1984; Kratzer 1996). Returning to the *explain* example, explaining a **problem** means saying why the problem happened, whereas explaining the **procedure** does not mean explaining why the procedure happened but how one follows it.

As noted previously, the CP complement serves more as an apposition than an actual argument:

(76) a. I **explained** [$_{DP}$ the problem].
'I said what was the reason for the problem.'
≈ $[\![$I EXPLAINED X$]\!] = \lambda x.explain(x)$(problem)

b. I **explained** [$_{CP}$ that there was a problem].
'I said that there was a problem by way of explanation (for something else).'
≈ $[\![$I SAID X AS EXPLANATION$]\!] = \lambda x.say[\exists\ y$ & $explanation(y)$ & FCONT$(y) = x]$(problem)

Where FCONT is a function endowing its first argument with propositional content from its second argument (Moulton 2013b:276).

The same story holds for other verbs. For instance, the meaning of [*observe* CP] is predictable in a way that [*observe* DP] isn't. The lexical semantics of *observe* is such that when selecting a proposition (CP), the meaning is always one of seeing something, but when selecting an individual (DP) the meaning is more free to vary. One can *observe the Sabbath* or *observe the patients*, with different denotations:

(77) a. I observed [$_{DP}$ the Sabbath] ≈ CARRY OUT RITUAL X

b. I observed [$_{DP}$ the patients] ≈ WATCH X

c. I observed [$_{CP}$ that the patients were angry] ≈ MAKE OBSERVATION X

d. I observed [$_{CP}$ that the car broke down] ≈ MAKE OBSERVATION X

Or take *guess*:

(78) a. Guess [$_{DP}$ the killer] ≈ FIGURE OUT THE IDENTITY OF X

b. Guess [$_{DP}$ the price] ≈ FIGURE OUT THE VALUE OF X

c. Guess [$_{CP}$ that John is the killer] ≈ SAY X AS A GUESS

This generalization is novel in some ways and well-known in others. The fact that *explain* can take two different kinds of complements was discussed by Pietroski (2000). He came close to making the same generalizations as us, but limited himself to just this one verb. In addition,

he resorted to thematic roles in order to account for the behavior of the DP and CP arguments, whereas we do not need recourse to theta roles. DPs are simply different kinds of objects than CPs. The issue was also picked up briefly by Halpert and Schueler (2013). In other work on clausal complementation, Moulton (2013b) invoked FCONT in order to extract the content of nouns such as *rumor* and *belief*. Moulton (2012) comes close to discussing the different meanings of *explain* and when they arise, but does not talk about that explicitly. Pietroski and Moulton touch the tip of a semantic iceberg. But it is only in the context of a framework that reads the semantics off the syntactic infrastructure, like the one we are developing here, that these intuitions can be generalized to other verbs and languages.

Next, note that the DP argument of these verbs can be substituted by a presuppositional [DP CP] with *the fact*:

(79) He **explained** [$_{DP}$ the fact that the building collapsed].
…The contractor was a crook, the building supplies were bought cheap and safety regulations were flaunted. (=74a)

Crosslinguistic evidence shows that just as in the presuppositional case, this behavior is not due solely to the lexical item *fact*; Overt Definite Presuppositionals in Hebrew, Greek and Persian have "DP shells" headed by a proximal demonstrative or the definite article.

(80) a. *hu hisbir* [*še-ha-binyan hitmotet*]
he explained COMP-the-building collapsed
'He explained that the building collapsed.'

b. *hu hisbir et* [***ze*** *še-ha-binyan hitmotet*]
he explained ACC **this** COMP-the-building collapsed
'He explained the fact that the building collapsed.' HEBREW

(81) a. *dustam tozih dād* [*ke cāy-e man rā xorde ast*]
my-friend explained COMP tea-EZ me ACC drank
'My friend explained that she drank my tea,' 'My friend told me that she drank my tea.'

b. *dustam tozih dād* [***in*** *ke cāy-e man rā xorde ast*]
my-friend explained **this** COMP tea-EZ me ACC drank
'My friend explained the fact that she drank my tea,' 'My friend explained why she drank my tea.' PERSIAN

(82) a. *i fili mu eksijise* [*oti ipce to tsai mu*]
the.F friend.F my explained COMP drank the tea my
'My friend explained that she drank my tea,' 'My friend said that she drank my tea.'

b. *i fili mu eksijise* [***to*** *oti ipce to tsai mu*]
the.F friend.F my explained **the** COMP drank the tea my
'My friend explained the fact that she drank my tea,' 'My friend explained why she drank my tea.' GREEK

It can be concluded that [V DP] phrases are able to take on an idiomatic interpretation while [V CP] phrases cannot.

6.2 Presupposition and Interpretation

What happens to presupposition in Overt Definite Presuppositionals? We have already seen the answer early on, in (14), expanded on here. The two effects hold at the same time, interpretation and factivity. A "regular" DP (83) and an Overt Definite Presuppositional (84) are both factive, on top of their idiomatic interpretations.

(83) Definite DP, [$_{VP}$ V DP]: Factive reading, special interpretation.

a. I explained [$_{DP}$ the collapse of the building].
'I explained why the building collapsed.'

b. #I explained [$_{DP}$ the collapse of the building], but it didn't really.

(84) Overt Definite Presuppositional, [$_{DP}$ D [NP CP]]: Factive reading, special interpretation.

a. I explained [$_{DP}$ the fact that the building collapsed].
'I explained why the building collapsed.'

b. #I explained [$_{DP}$ the fact that the building collapsed], but it didn't really.

(85) Selected Embedded Non-presuppositional, [$_{VP}$ V CP]: Non-presuppositional reading, appositive interpretation.

a. I explained [$_{CP}$ that the building collapsed].
'I said that the building collapsed.'

b. I explained [$_{CP}$ that the building collapsed], but it didn't really.

What this teaches us is that factivity and interpretation mirror each other: a definite DP is presuppositional and can get a special meaning as in (83)-(84), while a CP is non-presuppositional and does not receive special meaning (85).

It is time to take stock. Allowing predicates to take a DP or a CP complement is a good idea: some predicates require an individual/DP (*hit*), some require a proposition/CP (*seem*) and some require either one (*explain, see, observe*). Of the latter, the lexical semantics of some is such that there is a difference between CP complements and DP complements. This gives us a consistent view of the semantics: any special meaning will only arise from the interaction of the verbal root and the DP object, with the side effect that the object is presupposed to be a fact. The resulting prediction is twofold: that the meaning of all CP complements is generated in a predictable way and is "appositive" in some intuitive sense (Higgins 1972; Stowell 1981), but that not all DP complements must be interpreted in the same way. This prediction is borne out, helping us to cement the link between interpretation and presupposition.

An anonymous reviewer raises two good questions. One, they inquire about "functional" verbs such as *start* and *manage*, whose CP meaning is not appositive in the sense we allude to. There is actually good reason to think that the complement of such verbs is a *v*P, rather than a CP. See Cinque (2006) and especially Grano (2012) for a defense of this view. Secondly, the reviewer asks about embedded questions. They wonder whether the meaning of the embedded CP isn't different in the following two examples:

(86) a. I explained [$_{CP}$ who left].

b. I explained [$_{CP}$ that John left].

It seems to us that in both cases, the meaning is still "I said CP as explanation". An explanation of what exactly – that might vary from discourse to discourse. But note that (86a) cannot mean "I explained *why* x left" but only "I said that x left, and x's leaving is the reason for something else" That said, we will set embedded questions aside.

One last domain remains to be examined, namely, what happens to presupposition and interpretation in subject position.

7 Sentential Subjects

This section makes explicit two common observations about sentential subjects, analyzing them within the framework set up here: that they are nominal and that they are factive. We will see that sentential subjects are nominal either due to their being in Spec,TP or due to being merged as a DP complement of the verb and then raised. As expected by now, DP-hood is predicted to have two correlates: one is presupposition and possible factivity, depending on the specific matrix predicate. This will be shown to hold. The other is idiomatic interpretation. This prediction is borne out as well. But first, some background is necessary.

Sentential subjects have long been at the center of a debate as to whether they are generated as topics or as subjects, or more precisely whether they are generated high in the structure, coreferential with a null operator in the argument position (Koster 1978; Alrenga 2005; Takahashi 2010) or low in the structure, undergoing movement (Delahunty 1983; Davies and Dubinsky 2009; Hartman 2012). Lohndal (to appear) summarizes the evidence for both views.

Here is one of example of how the two can be teased apart. In support of the subject analysis, Lohndal (to appear) notes that phrases cannot be topicalized in an infinitival sentence (87b). If a phrase can appear above *to*, then, it must not have arrived there via topicalization. Yet sentential subjects can appear above *to* (87c), implying that they are actual arguments and not topics. This point relies on Delahunty (1983:389).

(87) a. Bill wants [to give a raise to Fred].

b. *Bill wants [to Fred to give a raise].

c. Bill wants [[that Fred lied] to be obvious to everyone].

We will assume sentential subjects to be "true" subjects in line with the tentative conclusions of Hartman (2012) and Lohndal (to appear). One implementation of these constructions as subjects generates a null DP in Spec,*v*P and a coreferential sentential subject in Spec,TP, leaving open the question of how the sentential subject is "made" into a DP (Lohndal 2013:4). That sentential subjects show nominal characteristics is not a new observation by any means, documented by Lees (1960); Rosenbaum (1967); Ross (1967) and treated more recently by Alrenga (2005); Takahashi (2010); Hartman (2012:ch. 3). The latter work documents a number of empirical and theoretical justifications for sentential subjects being nominal, including agreement, licensing of *pro*, and Case assignment (Hartman 2012:55).

In this section we will see that sentential subjects are usually factive—not a new observation, but one that has not yet been made explicit—with the result that active-voice sentential subjects are simply another kind of Overt Definite Presuppositional. Turning to passive clauses and unaccusative clauses, we will see that their presuppositionality and factivity are predictable from the matrix verb and the syntactic structure.

Once again the connection between selection, presupposition and interpretation will arise: on the one hand, verbs like *explain*—whose interpretation covaries with the form of their complement—give presuppositional readings even when passivized. On the other hand, raising verbs like *seem* which select for a CP give nonfactive readings when passivized. The same is true of verbs like *say* whose DP and CP meanings are the same.

An important assumption here is that the EPP feature is a [D] feature on T (Chomsky 1995). This means that any element merged in the specifier of TP will need to be a DP (but see discussion of the EPP in the Slavic syntax literature, e.g. Bailyn 2004). In English, this element can be a null Δ with a CP (a Selected Embedded Presuppositional) or a full "*the fact*" DP (an Overt Definite Presuppositional). There is also another way of getting a clause with a DP shell into subject position, which is by merging it low, as the complement of the verb, and then raising to subject position. We will argue that this is what happens with unaccusatives

and passives.

We will progress as before: first, a proposed structure. Then, the extraction facts. Then, presupposition and interpretation.

A word on the discursive status of subjects is in order first. New discourse referents are usually introduced as objects rather than subjects (Irwin 2012). A Gricean speaker will refer to a topic already existing in the CG, obeying the Maxim of Relevance. If an utterance does not explicitly mark a topic, the (definite) subject serves as one and so it seems safe to say that subjects are at the very least given. We will thus assume that subjects are discourse referents in the CG.[11]

Since subjects are given in the discourse, we assume that they are interpreted as presupposed. But what we seek to explain is what in the syntax leads them them to be interpreted as presupposed in the first place.[12]

7.1 Sentential Structures

We have postulated Overt Definite Presuppositional structures for a number of languages. In English, these structures are headed by *the fact that*, but in Hebrew, Greek, Persian, ASL and Norwegian, they are headed by a single definite determiner. If we take another look at these languages, an interesting pattern emerges. The same D from the Overt Definite Presuppositionals must head the sentential subject. For example, Hebrew sentential subjects are obligatorily headed by the determiner *ze*, just like in the Hebrew Overt Definite Presuppositionals. The same holds for the other languages; this is not a matter of presupposition but of grammaticality.

(88) [*(*ze*) *še-ha-binyan karas*] *hiftia oti*
this COMP-the-building collapsed surprise me
'(The fact) That the building collapsed surprised me.' HEBREW

(89) [*(*in*) *ke to u-ra da'vat na-kard-i*] *madar-at-ro narahat kard*
this COMP you he-OBJ invitation you-didn't mother-2SG-OBJ upset did
'That you did not invite him made your mother upset.' PERSIAN

(90) [*(*to*) *oti ehis filus*] *simeni pola*
the-NOM COMP you.have friends-ACC means much
'That you have friends means a lot.' GREEK

This empirical observation has not yet been made explicit, so we will discuss it here. The general structure of a sentential subject construction would be as follows, with a null DP coreferential with the sentential subject following Alrenga (2005) and Lohndal (to appear).

(91) a. [(*The fact*) *that the building collapsed*] *surprised me.*

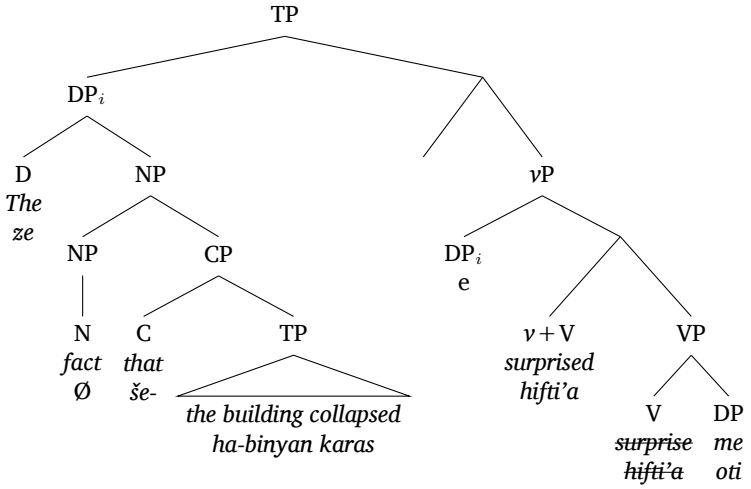
b. [*(*ze*) *še-ha-binyan karas*] *hiftia oti*
this COMP-the-building collapsed surprise me
'(The fact) That the building collapsed surprised me.' HEBREW

[11] An anonymous reviewer notes three cases in which subjects are arguably not presupposed: existentials of unaccusatives, existential bare plurals, and non-specific weak subjects on unergatives and transitives. Existentials such as *there* or *it* are expletives, and we would have to say that since they have no denotation they play no role here one way or the other. Existential readings of bare plurals are treated as presuppositional by Diesing (1992):

(i) Firemen are available (# but there are no firemen).

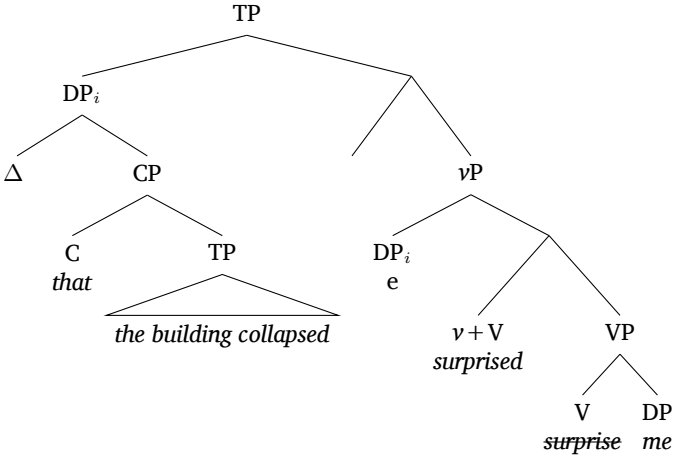
Subjects with weak determiners are indeed non-presuppositional, introducing a new discourse referent. For discussion of these see e.g. Diesing (1992:ch. 2).

[12] For more on new and old information see Clark and Haviland (1977) or, for a different take, Irwin (2012). On presupposed subjects see Guéron (1980); on their topichood and givenness, Lohndal (2013).



English is peculiar among the languages discussed here in that it allows for a sentential subject without an overt DP. It is not clear what the source of this cross-linguistic variation is, but for concreteness' sake we will analyze this structure similarly to other Selected Embedded Presuppositionals.

(92) [*That the building collapsed*] *surprised me.*



7.2 Extraction and the Sentential Subject Constraint

By treating sentential subjects as Overt Definite Presuppositionals, we claim that the CP embedded within is an adjunct. Extraction is not allowed from adjuncts, and hence not allowed from sentential subjects. The Sentential Subject Constraint can now be reduced to the ban on extraction from adjuncts or the Complex NP Constraint, just like with other Overt Definite Presuppositionals. This is a quick and elegant solution for all languages discussed here, other than English.

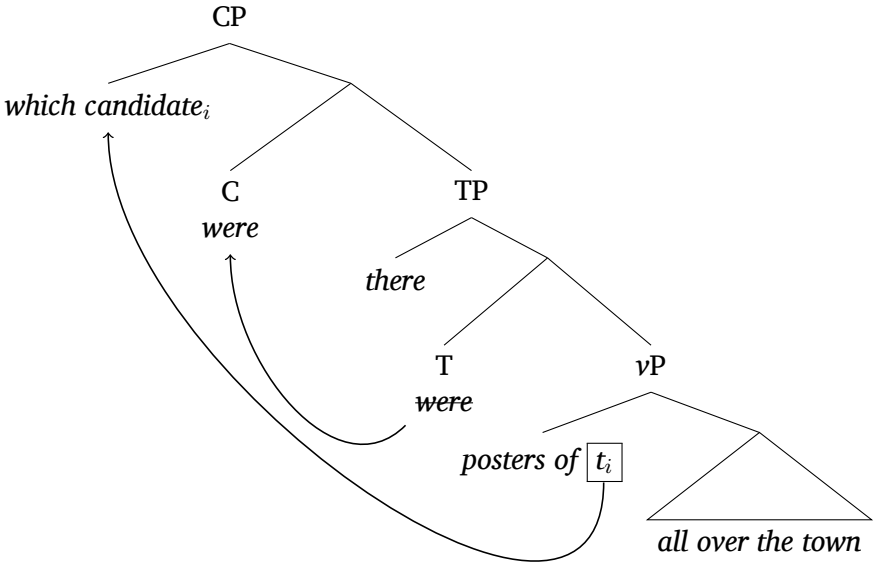
English also allows sentential subjects without *the fact that*, as in (92), but the Sentential Subject Constraint bans extraction even from them (Ross 1967). Can we find another reason to prohibit movement out of subjects?

It is here that we turn to the literature on subextraction and freezing effects. A number of researchers have attempted to explain the constraints on extraction from subjects in terms of phasehood (Gallego and Uriagereka 2006; Müller 2010) or similar restrictions on the compu-

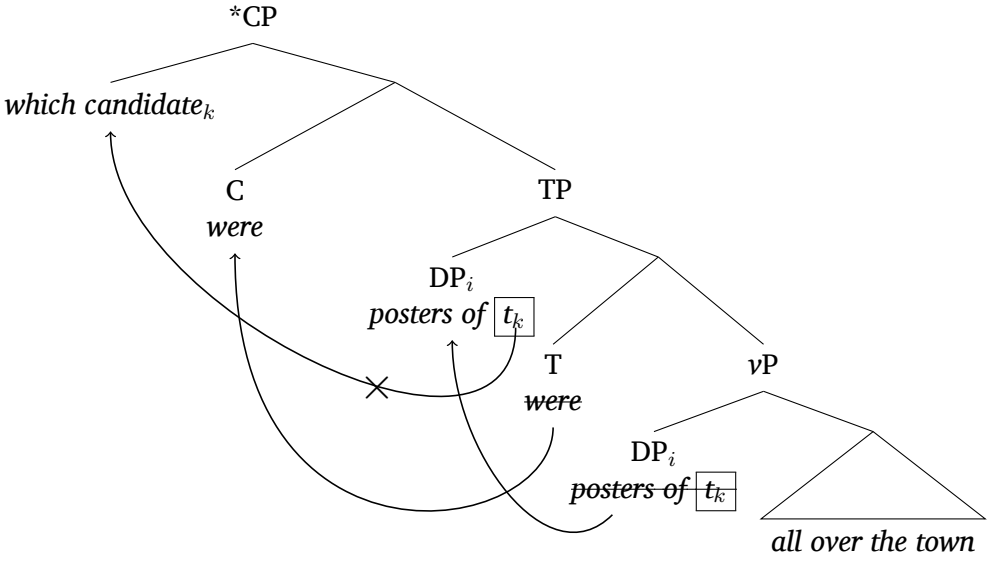
tation of merged elements (Nunes and Uriagereka 2000; Stepanov 2007).[13]

Take for instance the following contrast from Lasnik and Park (2003), where extraction out of a subject is fine if there is also an expletive in the structure. In (93a), *there*-insertion bleeds movement of *posters of which candidate* to Spec,TP and the resulting structure is grammatical. In (93b), no expletive is inserted, the subject raises to Spec,TP, and movement out of it is ungrammatical.

(93) a. $[_{CP}$ [Which candidate]$_i$ were **[**$_{TP}$ **there** $[_{vP}$ [posters of t$_i$] all over the town]]]?



b. * $[_{CP}$ [Which candidate]$_k$ were **[**$_{TP}$ **[posters of t$_k$]** $_i$ $[_{vP}$ t$_i$ all over the town]]]?



In their analysis of data such as these, Gallego and Uriagereka (2006) suggest that once an element undergoes A-movement—as is the case of the subject in (93b)—it is "frozen" and

[13] For a different view on economy of derivation and spell-out of domains, see Neeleman and Reinhart (1998).

none of its parts can undergo any other movement operations (an idea going back at least to Wexler and Culicover 1980 and Diesing 1992). To implement this idea, Gallego and Uriagereka propose a process of *phase sliding* in which *v*, a phase head, extends the phase upon adjunction to *T*. See similar ideas and a systematic working out of their consequences in the other works cited above and in den Dikken (2007) and the associated replies.[14]

The upshot is that the ban on extraction from sentential subjects should not be surprising if we take them to be just another DP that has raised from Spec,*v*P to Spec,TP. Next we discuss the consequences in terms of factivity and interpretation.

7.3 Factivity Mirrors Interpretation

By now we have established that the sentential subject sitting in the specifier of TP is itself a DP. In a recent commentary, Bhatt (2010:176) noted that "*certain sentential subjects (but not all) are interpreted factively*". His examples are reproduced here:

(94) a. That John is so tall is amazing.

b. #That John is so tall is false.

c. That John is rich is widely believed by his classmates. (He's managed to fool them all!)

Which sentential subjects are interpreted factively and which are not? It is best to address their presuppositionality first. We will confine ourselves again to verbal predicates.[15]

A definite DP is interpreted as a definite description, referring to a discourse referent in the CG. Hence, any definite DP in subject position will be presupposed. The examples in (94) all presuppose that John's tallness or richness is already a topic of conversation. To see whether or not a given sentential subject is factive, we need to check the entailments of the matrix predicate, just like in the case of clausal complements. As noted before, the status of copular sentences is unclear and we will not pursue them in depth. While Bhatt (2010) judges (94b) as ill-formed (repeated below as (95a), an anonymous reviewer judges (95b) acceptable.

(95) a. #That John is so tall is false.

b. That John is tall is a misconception.

Nevertheless, it is possible to find environments in which factivity arises even when the matrix verb is not factive. To see this, we will need to look at cases where a non-presuppositional verb selects a clausal complement which is raised to CP. This is what happens in **passives**. Let us start with a non-sentential subject construction. As discussed earlier, the difference between an Selected Embedded Non-presuppositional and an Overt Definite Presuppositional is that the latter is factive and may receive an idiomatic interpretation. The CP utterance (96a) is nonpresuppositional and has the "simple" interpretation, while the DP utterance (96b) is presuppositional and has a "special" or idiomatic interpretation.

(96) a. The Mayor explained [$_{CP}$ that the building collapsed].

b. The Mayor explained [$_{DP}$ the fact that the building collapsed].

When the sentences are passivized, our prediction is that the resulting structure has to be a DP in order to merge in Spec,TP, and therefore will be factive and possibly idiomatic. This is borne out.

[14] We are grateful to an anonymous referee for pointing out the relevance of this literature.

[15] Nominal and adjectival complements are trickier. Note, for example, that utterance (94b) is fine if *so tall* is replaced by *four feet tall*:

(i) That John is four feet tall is false.

It is unclear whether the speaker is directly challenging the presupposition here.

(97) [$_{DP}$ That the building collapsed] was explained by the mayor (# but it didn't collapse). …The contractor was a crook, the building supplies were bought cheap and safety regulations were flaunted.)

Pietroski (2000) and Halpert and Schueler (2013) reach a similar conclusion independently of us, but do not connect the interpretation facts with factivity.

They also do not go beyond *explain*, but we will. For our next step, we take a number of non-presuppositional verbs that show different interpretations based on whether their complements are CPs or DPs. *Explain* is one, and we have seen that *observe* and *guess* are two more. In all three cases, the passivized versions give rise to factivity and the idiomatic reading. This is because the DP was originally merged as such, creating the basic [V DP] structure. Since interpretation is decided based on their relationship with V, then whatever meaning is established inside the VP will persist even if the object is promoted to subject (98). In contrast, if we take non-presuppositional verbs which exhibit no difference in interpretation between CP complements and DP complements, the result is non-factive and non-idiomatic (99).

(98) Presuppositional, factive, with idiosyncratic meaning.

a. That the building collapsed was explained by the mayor.

b. That the building collapsed was observed by the mayor.

c. That John is the killer was guessed (at) by the fortune teller.

(99) Presuppositional, non-factive, no special meaning.

a. ?That the building collapsed was said by everyone.

b. That the water is safe to drink was reiterated (disingenuously) by the mayor.

c. That this is the right way of analyzing the sentence is thought (wrongly) by many.

Whether or not a sentential subject will be factive is thus fully predictable, solving Bhatt's puzzle: if the verb is factive then the sentential subject will be factive (*know*, *remember*). That much is self-evident. But if the verb can take DPs or CPs with different interpretations, then it is also predicted to yield factive sentential subjects (with potentially special interpretation).

Further insight is lent by another form of passivization. The **impersonal passive** allows only the CP-like "say x" reading, not the DP-like "explain why x" reading:

(100) It was explained by the Mayor that the building collapsed (but he was mistaken). ≈ The mayor said that the building collapsed.

What is the structure of the impersonal passive? A number of researchers have suggested that the expletive *it* raises to subject position, leaving the embedded clause low. See one such system in Stroik (1996). If this is correct, then embedded clauses as in (100), which appear in a postverbal position, were never subjects to begin with. Such a clause is simply a CP complement of the verb, and as such it receives neither idiomatic nor factive interpretation. Another way of looking at this datapoint is from a counterfactual view: if the embedded clause had been a subject, it would have had to be a DP. If it had been a DP, it would have received idiomatic and factive readings. But since it does not, it cannot be a DP.

The impersonal passive is also able to accommodate verbs like *agree* or *hope*, which never take a DP as a direct object.

(101) a. *John **agreed/hoped** [$_{DP}$ the book / lunch].

b. It was **agreed/hoped** [$_{CP}$ that they would go to lunch / that they would finish the book].

Once again, this example is incompatible with the lower clause being a DP. These facts provide further fodder for the claim that the impersonal passive is not derived from an underlying active

sentence in which a DP object was raised to subject.

7.4 Sentential Subjects and Raising

Developing Bhatt's examples some more, we examine raising predicates and find that they are nonfactive. The DP-ness of sentential subjects in raising constructions can be further established based on the work of Alrenga (2005:175) and Lohndal (to appear), who discuss the difference between *seem* and *suck*. They point out that verbs like *seem* cannot select a DP and cannot take a sentential subject.

(102) a. [The Giants' loss] really sucks/*seems.

b. [That the Giants lost] really sucks/*seems.

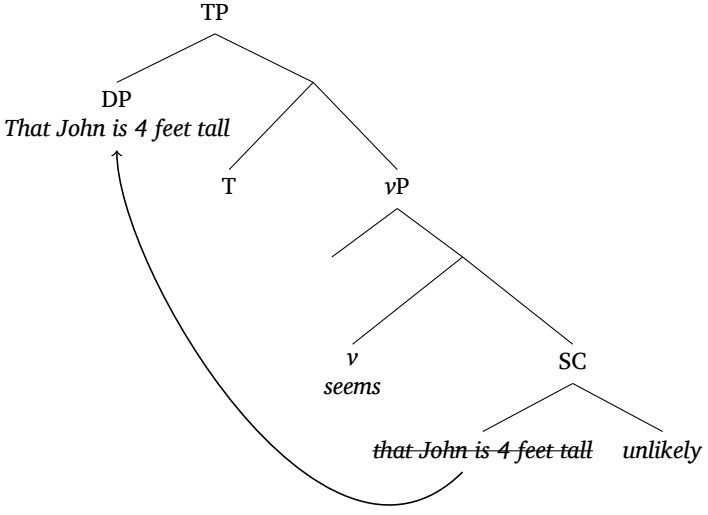
What about factivity in raising constructions? We find that no presupposition failure arises when negating a raised sentential subject, although the construction does sound odd to some speakers.

(103)%That John went to Cambridge {appears / seems / turned out} to be false.

The nonfactive reading in (103) makes sense since a raising verb is the kind of verb that can never take a DP complement, and so it will never license a definite, presupposed DP. The flipside of this observation is that raising verbs can take only sentential subjects, implying that sentential subjects must be derived from a non-CP structure.

Other predicates are also compatible with our analysis; in (104), *unlikely* requires its argument, *that John is four feet tall*, to be nonfactive by virtue of its lexical semantics: for something to be unlikely it cannot always be true. The argument is then raised, remaining nonfactive.

(104) [$_{DP}$ That John is four feet tall] seems unlikely.



This leaves us with the counterexample in (94c) above, repeated here:

(105) That John is rich is widely **believed** by his classmates. (He's managed to fool them all!)

The sentential subject is nonfactive but it is still presuppositional. The issue here is the verb *believe*, which is incompatible with factives across the board:

(106)??Bill believed the fact that John was rich.

(107) # Bill believed the rumors.

Utterance (107) is well-formed, but rumors are not facts. Without entering into metaphysics, it seems that *believing* is not compatible with factivity: if what one believes is a fact, then believing should become *knowing*.[16]

This talk of passives and raising predicates raises another question, the last one we will consider in this section: why is the DP shell for sentential subjects not available in object position?

7.5 D and Clausal Complements

The same question was posed in different ways by a number of authors (Alrenga 2005; Farudi 2007; Takahashi 2010; Sheehan and Hinzen 2011; Hartman 2012): if sentential subjects have a silent DP shell, why don't objects? Put otherwise, why is (108a) not a possible DP shell if (108b) is?

(108) a. * This formulation of the rule captures [$_{DP}$ D [$_{CP}$ that these nouns behave differently]].

b. [$_{DP}$ D [$_{CP}$ That these nouns behave differently] is captured by this formulation of the rule.

The emerging consensus in the literature is that a complement CP must be made into a DP in one way or another using a "dummy" D before it can become a sentential subject. Hartman (2012:62) calls this a Last Resort principle, for instance, inserting a DP shell post-cyclically. Sheehan and Hinzen (2011) invoke the Empty Category Principle. Takahashi (2010) uses a more elaborate system, placing an uninterpretable feature on D and an EPP feature on Topic, forcing movement.

But the issue runs deeper. Here is another way of looking at it. Take the examples from (20) on page (9), repeated here as (109). Why isn't (110) a good structure for (109b)?

(109) a. The President answered [$_{DP}$ the question].

b. The President answered [$_{CP}$ that construction will go ahead as planned].

(110) The President answered [$_{DP}$ Δ [$_{CP}$ that construction will go ahead as planned]]. (to be rejected)

The system we have built makes a prediction regarding the interplay of syntax and semantics for presuppositional verbs. Consider the kinds of events that these are. Response stance verbs (*deny*, *admit*, *accept*) are speech acts, undertaken with regards to a certain proposition. Non-stance verbs (*remember*, *forget*, *realize*, *notice*) are a kind of psych-verb, denoting a subject-internal reaction to a proposition. These verbs denote events in which the subject accesses a filecard and updates it.

[16] An exploratory Google search did not turn up any appropriate examples for the string {*believed the fact that*} within the first 50 results. However, the minimally distinct string {*believe the fact that*} was relatively common in downward-entailing environments.

(i) Why cant right handed people believe the fact that left handed people are smarter? [http://answers.yahoo.com/question/index?qid=20121106114105AAYwuDm]

(ii) GOP Lawmaker Refuses To Believe The Fact That Rep. Eric Cantor Is Shorting U.S. Treasury Bonds [http://thinkprogress.org/politics/2011/07/08/263264/olson-cantor-shorting-treasury/]

(iii) I Don't Believe The Fact That Teachers Have Extra Eyes Behind Their Heads [http://www.facebook.com/pages/I-Dont-Believe-The-Fact-That-Teachers-Have-Extra-Eyes-Behind-Their-Heads/280518226833]

All examples were retrieved May 2013. We leave further investigation into this phenomenon, if it ever does hold up to further scrutiny, to future work.

On the other hand, there are verbs that entail the creation of a new entity. For example, Diesing (1992:111) writes that verbs like *write*, *draw* and *paint* "denote the bringing of their objects into existence and therefore are incompatible with the notion of preexistence". The same goes for the volunteer stance verbs: they bring about the existence of a proposition. It is not possible make a drawing and have that exact same drawing already exist. Likewise, it is not possible to make a novel proposition and have that proposition already exist. But it is possible to refer to an existing proposition. Technically speaking, verbs like *say*, *think*, *answer* and *iterate* (on its volunteer stance reading) do not license the presuppositional determiner Δ.

Here is an algorithmic view of how to use silent definite determiners.

(111) Attempt to merge a DP headed by Δ with V. Is the DP licensed by V?

a. If so, interpret it as the object. Idiomatic interpretation and factivity might be involved.

b. You may raise this DP to subject in order to satisfy the EPP.

c. If the DP is not licensed by V, attempt to raise it to subject in order to satisfy the EPP.

This leaves us with the question of why verbs like *capture* do not license Δ. Simply put, *capture* is not a response stance or a non-stance verb. It patterns together with a number of other verbs of communication (Kuno 1973; Grimshaw 1982; Jacobson 1992; Alrenga 2005; Takahashi 2010)):

(112) a. This formulation of the rule {**captures** / **expresses** / **reflects** / **brings out**} [$_{DP}$ the fact/*D [$_{CP}$ that these nouns behave differently]].

b. Even Aristotle **contemplated** [$_{DP}$ the possibility/*D [$_{CP}$ that the moon is made of cheese]].

c. We have **given** [$_{DP}$ the possibility/*D [$_{CP}$ that Jack is a double agent]] serious **consideration**.

While it is true that these verbs refer to some proposition, they are not speech acts like the response stance verbs nor are they factive verbs, expressing a psychological attitude towards a proposition. So they are not the kind of verb that licenses Δ.

7.6 Summary

In this section we suggested that sentential subjects are Overt Definite Presuppositionals, thereby accounting for two observations made previously: that they are factive and that they are nominal. This analysis also explains why they are headed by certain determiners crosslinguistically. We also considered counterexamples to these generalizations: nonfactive sentential subjects, which stem from passives and raising verbs. The facts all fall into place from our minimal assumptions about the selectional requirements of different predicates.

A [D] feature on T forces elements in Spec,TP to be DPs. This means that every subject is a DP, and accordingly that every sentential subject is a DP. Some sentential subjects are born DPs, some achieve DP-ness, and some have DP-ness thrust onto them. The combination of an object DP with V may result in idiomatic interpretation and factivity. If the object is just a CP complement, raising it to subject will force it to be merged as a DP with a silent Δ .

With the analyses of selection, extraction, fronting, anaphora, interpretation and sentential subjects behind us, there are a few alternative accounts to consider.

8 Alternative Analyses

The original account of factive verbs in Kiparsky and Kiparsky (1970) posited the existence of a silent FACT heading the embedded clause (113a). Already the Kiparskys themselves noted (Kiparsky and Kiparsky 1970:147ff) an immediate problem with this analysis, which is that even though verbs like *know* and *realize* are factive, it is not possible to say (113b). We add that it is also impossible to say (113c). This kind of analysis was also not built to handle the extraction, fronting and interpretation facts presented here.

(113) a. I know FACT that John is here.

b. *I know the fact that John is here.

c. *I know FACT which John is here.

Similar problems hamper Kayne's proposal (Kayne 2008, 2009; see also Arsenijević 2009) which keeps the silent FACT as the head of a relative clause, in a system which attempts to reduce all subordination to relativization. Later accounts have departed from the silent FACT analysis.

8.1 Defective phases

A different tack is pursued by Basse (2008)—adopting and adapting de Cuba 2007—who treats factive clauses as defective phase heads lacking an Edge Feature, namely [ASSERTION]. Without an Edge Feature no element can pass through the phase edge. Fronting is then ruled out, since there is no left periphery to move to.

To explain the extraction facts, Basse suggests that direct objects are probed by the matrix V: its [ACC] feature probes into the embedded clause, finding the object within it. The degradedness (in some languages) or ungrammaticality (in others) of extraction from factive clauses is then said to be a result of multiple agreement: first the lower V checks [ACC] on the object and then the matrix V does the same.

It is unclear, though, why the higher V must trigger movement of the embedded object rather than checking its feature *in situ*. Furthermore, this system cannot explain why it is complements rather than objects that can be extracted, in accordance with the Empty Category Principle (Chomsky 1986). Extraction of the complement of V is as good as extraction of the complement of P, meaning that this movement cannot be reduced to accusative case checking.

(114) Repeated from (26):

a. What do you remember [(that) John **stole** ___]? [V DP]

b. Where do you remember [John came **from** ___]? [P DP]

8.2 Bulgarian [PP [DP CP]]

Krapova (2010) has proposed an account of factive clauses based on Bulgarian data which resembles our Selected Embedded Presuppositionals to a certain extent. Her account embeds the CP in a DP, but then embeds the latter in an additional PP layer: the structure in her theory involves a P and a D.

The Bulgarian data are different than the kind surveyed here, though: the embedding predicates in question are not factive but emotive (*worry*, *be sorry*, *be happy*), and the C involved is the relativizer rather than the factive complementizer. As for the analysis, we do not require a silent embedding P but that does not preclude our structure from being embedded by a silent P in Bulgarian if necessary.

Slavic languages are not addressed at all in our paper; the behavior of elements like *čto* 'what' and *to* 'that' in Russian and related languages is complicated and must be left for further work, though see Progovac (1998) for a possible starting point.

8.3 Contrary Islands

Our treatment of presuppositional islands buys into the theory of weak islands in Honcoop (1998), which aims to integrate the algebraic insights of Szabolcsi and Zwarts (1997) into a dynamic semantics framework. More recently, Abrusán (2011) has been developing a system that seeks to explain presuppositional and negative islands in terms of the contradictions that might arise during interpretation. Take for example her treatment of "one-time-only" predicates like *get*. These predicates induce island effects under factives, unlike their iterable counterparts like *show* (Abrusán 2011:277):

(115) a. To whom do you regret having **shown** this letter?

b. *From whom do you regret having **gotten** this letter?

The first example (115a) is unproblematic, since it presupposes that you have shown the letter to more than one person. But if you are presupposed to get the letter from more than one person, that is impossible. This is why (115b) is bad.

The problem with this account is that it does not extend easily from factive verbs as in (115) to the other kind of presuppositional verbs, namely response stance verbs. For factive verbs every individual holds the belief expressed by the embedded clause, since it is true no matter who utters it. But for response stance verbs it is enough that one individual holds the belief; it may not actually be true for everyone. To her credit, (Abrusán 2011:291) tackles this issue head-on with the following example, her (98).

(116) *Context:* Peter, Fred and Mark and their wives. Each of Peter, Fred, and Mark believe that John slept with their wives (and only their wives).
Which of these three women did Bill deny/admit that John slept with?

As she puts it, "the existential presupposition of the alternative answers can be satisfied by different individuals in the context" (Abrusán 2011:292). But if that were the case, then utterances like the following should be allowed, contrary to fact:

(117) *How did Bill deny/admit/verify that John fixed the car?

This issue arises because the system in Abrusán (2011) needs for a certain individual to project the presupposition. That allows for (116). However, that wrongly predicts that (117) should be fine. Our account in effect projects the presupposition already in the syntax. It is handed off to the interpretative component, at which point the system developed by Honcoop (1998) kicks in and makes the right predictions.

8.4 Referentiality Operator

Haegeman and Ürögdi (2010a) have developed an analysis in which a referential (i.e. factive, i.e. presuppositional) operator intervenes between the left periphery and TP in the embedded clause, ruling out movement. The idea is that leftward movement of a factive element is blocked in a Relativized Minimality way by an operator that has the same factive feature (Rizzi 1990, 2004): the factive element cannot be probed by an element in the left periphery since the operator is found instead. In a way, this is the mirror image of Basse's account; where his embedded clause is [-ASSERT], theirs is [+REFER].

(118) The basics of the referentiality account (Haegeman and Ürögdi 2010a:137):

a. Non-factive predicates take either a referential or a non-referential clause, while factive predicates can take only referential clauses.

b. Referential clauses denote a proposition with no illocutionary force. A referential clause cannot be an utterance or a speech act unto itself.

c. Non-referential clauses involve a conversational move, i.e. a speech act. Factive verbs cannot embed speech acts because speech acts must contain novel information (de Cuba and Ürögdi 2009).

Our system has clearly benefited from Haegeman and Ürögdi's contribution, but we find it preferable to theirs for a number of reasons.

The authors propose that a referential operator intervenes between the left periphery and any material in the embedded clause, ruling out extraction. However, this operator is a theoretical device which does not seem to be overt in any language. Its characterization as a referential operator is also somewhat vague (Bhatt 2010; Kallulli 2010) and its exact position in the clause is still a matter of debate (Aboh 2010; Lipták 2010). It is also there to do the relevant syntactic and semantic work of a functional head without binding any variable as operators normally do.

The claim that referential clauses have no illocutionary force whatsoever is debatable. Under this account, a referential clause is comprised of a proposition, made referential by an operator, embedded in illocutionary force, (119a). The result is referential thanks to the referential operator and utterable thanks to Force; in their system, the referential clause is not a DP. Our analysis embeds the presupposed proposition in a DP, resulting in a presuppositional (or "referential") element. This D endows the proposition with referentiality, turning it into a DP along the way, (119b).

(119) a. [Force [Op$_{referential}$ [proposition]]] $\leftrightarrow$ *it*$_{referential}$

b. [Δ [proposition]] $\leftrightarrow$ Δ *it*$_{referential}$

Furthermore, the notion of referentiality as used in this theory is not sharply defined, and it is not clear whether or not it is indeed empirically different from factivity or presupposition (Kallulli 2010; Bhatt 2010; Haegeman and Ürögdi 2010b).

Under this theory, fronting and extraction are linked such that a single operator blocks both operations. The theory then makes the prediction that fronting should never be allowed where extraction is not, and vice versa. We will now present some evidence from Greek that this prediction is too strong, with the important caveat that Haegeman and Ürögdi (2010a) do not discuss any Greek data. Neither they, nor us, present an in-depth analysis of the Greek complementizer system. That said, fronting in Greek factives is easier than in English or Hebrew:

(120) *o Tom kseri oti* [*afto to vivlio, i Maria den to djavase*].
the Tom knows that [this the book, the Mary not it read
'Tom knows that this book, Mary didn't read.

As mentioned above in our discussion of extraction, there may be idiolectal or dialectal variation among speakers of Greek. But if for some extraction is banned while fronting is allowed, that would constitute a point against a unified analysis as in Haegeman and Ürögdi (2010a).

This theory has two additional shortcomings when compared to the one developed here: it is not built to account for the difference in interpretation between DPs and CPs, but more importantly, it predicts that sentential subjects should be CPs and not DPs (since referential clauses are not DPs in this system). As we have seen, though, sentential subjects are nomi-

nal. Any analysis that posits a null operator which is not a determiner faces the problem of accounting for the DP-like properties of presuppositional clauses. Assuming as we do that the relevant operator is actually a determiner kills both birds with one stone.

Lastly, our analysis has the added benefit that it does not postulate an extra element, insofar as Δ is syntactically and semantically motivated crosslinguistically in a way that the referential operator is not. And so although the prospect of unifying fronting and extraction effects under one referential-operator analysis constitutes a creative approach to factivity effects, we do not adopt it.

8.5 Moving Clauses

We conclude with work that bridges alternative analyses and avenues for future exploration. Recently, Takahashi (2010) and Moulton (2009, 2012, 2013a,b) have advanced the debate on where clauses are generated and how they are moved by considering a variety of reconstruction and binding facts. Their discussion not only ties in to the issue of whether sentential subjects are subjects or topics but has additional consequences regarding what elements can move in the grammar.

Takahashi (2010) reaches the conclusion that clausal complements are CPs, base-generated low in the structure as complements of the verb. An anaphor in a sentential subject does not cause a Condition A violation since it reconstructs low:

(121) [That some student from his$_i$ class cheated on the exam] seems to [every professor]$_i$ to be captured ~~[that some student from his$_i$ class cheated on the exam]~~ by this document . (Takahashi 2010:349)

But the verb *seem* shows an anti-reconstruction effect, implying that there is no copy left down low:

(122) D [That John$_i$'s sister cheated on the exam] seems to him$_i$ to be captured *t* by this document. (Takahashi 2010:362)

Capitalizing on the notion that sentential subjects are headed by a covert D, Takahashi hypothesizes that the clause *that John's sister cheated on the exam* merges counter-cyclically as the restrictor of D only once D itself has raised, as has been proposed for adjuncts (Lebeaux 1988; Takahashi 2006). That is to say, the embedded clause attaches to D at the end of the derivation.

This system is compatible with ours, since the verb can take both CP and DP complements. The two main differences are that it is not meant to deal with presupposition, interpretation, extraction or fronting facts; and that movement of a raised sentential subject is possible because the covert D is equipped with an uninterpretable feature F that is attracted by the EPP feature on Topic (Takahashi 2010:359). This theory also does not explicitly address the fact that the D in sentential subjects is the same D in certain clausal complements crosslinguistically, nor why this D is always a definite determiner.

Moulton (2013b) builds a different kind of theory; for him, clauses never move. His framework is thus more compatible with an analysis including high CPs coreferential with lower null DPs, as in the Koster (1978) analysis of sentential subjects. The range of data he provides is impressive but we cannot do justice to it in this brief summary. A representative example is his (42), reproduced here as (123), in which a CP appears in what looks like a left-dislocated position. Moulton takes this as evidence that CPs may be base-generated high, but not DPs.

(123) a. …but [$_{CP}$ that he$_i$ gave the wrong answer to Mrs. Brown$_j$], I don't think she$_j$ would want any student$_i$ to believe/worry about.

b. *…but [$_{DP}$ the paper that he$_i$ gave to Mrs. Brown$_j$], I don't think she$_j$ would want any student$_i$ to worry about. (Moulton 2013b:260)

When Moulton does address sentential subjects he makes interesting findings. For psych-verbs, he notes a few binding properties attributed to the factors discussed by Belletti and Rizzi (1988). We, too, have not discussed the role of psych-verbs in these constructions, though we should in the future, especially considering how prevalent they are in sentential subject constructions (*That the building collapsed surprised/saddened/amazed/intrigued him.*)

Finally, the "canonical" sentential subjects as discussed by Takahashi and by us are argued to be base-generated low, since the representative example (147), reproduced here as (124), does not show reconstruction effects.

(124) …but [that he$_i$ might be too old for Mary$_j$] didn't appear to her$_j$ to enter any man$_i$'s mind. (Moulton 2013b:287)

The evidence thus seems to converge on the idea that sentential subjects are generated as subjects, behaving differently from topicalized CPs.

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9 Conclusion

The novel data in this paper come in two flavors: differences in interpretation depending on the kind of complement, and differences in presupposition (what is sometimes called "factivity"). The syntactic category of the complement is important: presupposition and special interpretations cannot arise unless there is a definite DP in the structure. The result is that presupposition and interpretation go hand in hand, dictated by the selectional properties of the embedding predicate. This result lends insight into our understanding of argument structure, furthering our knowledge of the kind of arguments different verbs can take.

We started off with the idea that presuppositional verbs do not introduce a new discourse referent but call up an existing one from the conversational Common Ground. One we modelled this discourse referent as a definite DP, a range of facts fell into place. We summarize the main arguments brought forward and consider possible extensions.

9.1 Summary of the Arguments

Presuppositional clauses are definite DPs: crosslinguistic data show that they may be headed by an overt D which is always definite, never an indefinite article or a distal demonstrative. The definiteness serves to pick out a salient discourse referent, i.e. a presupposed one. Extraction effects can be viewed in terms of extraction from a weak island (for Selected Embedded Presuppositionals) or from a Complex NP/adjunct island (for Overt Definite Presuppositionals).

Fronting effects are explained by allowing Selected Embedded Presuppositionals to have a reduced left periphery, a technical implementation of the reduced illocutionary force exhibited by presupposed utterances as opposed to assertions. It is made available through selectional relations between the matrix verb, the selected determiner Δ and the embedded complementizer.

That Selected Embedded Presuppositionals are DPs serves to explain why certain clauses can be referred to using the CP anaphor *as* and others using the DP anaphor *which*.

Clausal complements can be CPs or DPs: different meanings arise depending on the kind of complement. In other words, there is a form-meaning isomorphism in which CPs are appositives and DPs are individuals with potentially unpredictable meaning.

Sentential subjects are Overt Definite Presuppositionals crosslinguistically. They, too, are DPs containing a presupposed clause. They are headed by the same D as embedded factive clauses, a fact that has escaped notice so far.

The lexical semantics of the matrix predicate interacts directly with D and C/Force it embeds, accounting for patterns of presupposition, interpretation and polarity. By considering whether a certain predicate selects for a CP or a DP we are able to predict syntactic and semantic effects. Selection for a proposition corresponds to selection for CP, whereas selection for a definite individual corresponds to selection for a definite DP. The crosslinguistic data corroborate the claims made here.

9.2 Future Work

We have already pointed out a number of issues worth looking into along the way. These include psych-verbs, non-verbal predicates such as *is clear* and *is so tall*, factivity in downward-entailing environments, embedded clauses in Slavic, and comparison with topicalization of clauses.

An additional topic would be the further investigation of the illocutionary V-D-C spine; Adger and Quer (2001) have demonstrated a syntactic-semantic thread running through "unselected embedded questions" between a matrix predicate, the D embedding the complement clause, and the embedded C. Our study reaches similar conclusions for presuppositional predicates. It is not implausible to expect similar interactions in additional domains, besides polarity-sensitive items and presuppositional items. Put otherwise, the question is what is the nature of the semantically-sensitive determiner Δ and what is the semantic role of COMP-drop.

The study of assertions and fronting has benefited from much inquiry into Mainland Scandinavian (e.g. Bentzen 2010). Detailed examination of V2 phenomena within the theory proposed here is yet to be carried out, but one place to start would be with the claim that sentential subjects are in and of themselves a Main Clause Phenomenon and cannot be fronted (Lohndal to appear).

Cross-linguistic differences arise in intriguing ways under our theory. English, Norwegian and German allow sentential subjects without an overt D and NP; Hebrew, Greek and Persian do not; and American Sign Language shows variation. What does this difference mean? Perhaps a silent element like Δ can satisfy the EPP under its reformulation in Landau (2007) in some languages but not in others.

And finally, in some languages the kind of clause (main or embedded, perfective or imperfective) seems to correlate with a different form of the verb. For example, in Japanese there are two kinds of complementizers, nominalizer-like complementizers that pattern with determiners (they take case markers, can be coordinated with DPs, act as objects of postpositions and so on) and those that pattern with "ordinary" complementizers (Hiraiwa 2010). The former are factive and appear with verbs in the END FORM, which is the form of the verb in main clauses. The latter are nonfactive and appear with verbs in the ADNOMINAL FORM, which is used in relative clauses and nominalizations. Our system predicts that the "factive" ones will turn out to be presuppositional and show the same kind of behavior as presuppositional clauses in English, Hebrew, Greek and Persian. In Hungarian, differences in factivity and interpretation are often collapsed together, such that one entails the other: perfective prefixes on the matrix verb entail a factive reading for the embedded clause. Granted, the Japanese and Hungarian phenomena may be unrelated. Still, once these data are properly reviewed, we might learn

something new about what makes embedded elements "more presupposed" or "more nominal" in some languages (cf. Potts 2002; Legate 2010). We have shown here that the two notions are strongly related.

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