Exfoliation: Towards a Derivational Theory of Clause Size[1]

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Abstract

Across the languages of the world, we repeatedly find that the extraction of the subject of an embedded clause correlates with a reduction in the size of that clause. This generalization suggests a novel unification of two questions that are not generally considered to represent parts of the same puzzle:

1. Why do non-finite clauses exist in the first place, and why do the properties of subject position in nonfinite clauses differ so often from their counterparts in finite clauses?
2. What accounts for the obligatory absence in so many languages of the normal declarative complementizer when the subject is Ā-extracted — so-called ”complementizer-trace effects”?

Common accounts of the special properties of the subject position of non-finite clauses take for granted the fact that such clauses exist in the first place, viewing this as a consequence of free lexical choice — and attribute the special properties of their subjects to deficiencies related to case, agreement or tense. Such accounts put nonfiniteness in the explanatory driver’s seat and view the special properties of the subjects of nonfinite clauses as derivative.

I argue for the opposite logic: that nonfinite clauses start out full and finite, and are rendered nonfinite as a by-product of subject extraction — which triggers a rule of *Exfoliation* that peels away outer layers of the clause so the subject ends up occupying its edge. This proposal is essentially a 21st-century revival of an idea from the earliest days of generative grammar: that infinitival clauses are derivationally created from clauses that start their lives full and finite, as a consequence (not a cause) of processes such as raising and control.

On this view, complementizer-trace effects are just the consequence of a shallower application of Exfoliation that leaves tense and agreement untouched, but peels away the CP layer, and perhaps some others — once again, in order to place the subject at the edge of the clause, so that it can be extracted. Though infinitivization is usually studied in the context of A-movement and complementizer-trace effects in the context of Ā-movement, instances of Ā-movement-triggered infinitivization and A-movement-triggered complementizer-trace effects are also found.

The final chapter returns to nonfinite clauses and offers an account of their restricted semantic options as a consequence of the need for a hearer to ”reverse engineer” the contents of material that Exfoliation has deleted in the course of the speaker’s derivation.

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Chapter 1

Introduction

As linguists, we should be puzzled and surprised by the menagerie of clause types and sizes found in so many languages of the world — for example, the variety of italicized English clauses in (1):

(1) a. Mary thinks *that Sue speaks French well*.
b. Mary would prefer *for Sue to speak French well*.
c. Mary considers *Sue to speak French well*.
d. Mary remembers *Sue speaking French well*.
e. Mary heard *Sue speak French well*.

There are of course names for the many variants that we find: finite clause, infinitival clause, gerund, etc. But a name is not an explanation, nor does a taxonomy of clause types tell us why there are so many clause types in the first place — or indeed why there is more than just one.

Reconsideration of this question is not only timely but overdue, because of an odd property of the history of generative treatments of clause type that appears to have gone unnoticed. For more than four decades, the standard approach to clause-type distinctions has had a crucial property that I will call *lexicalist*. In a lexicalist account of clause-type distinctions, the repertoire of lexical items and the rules for syntactic structure-building are assumed to be rich enough to permit the direct generation of the various clause types found in a given language. In such an approach, the choice to build a finite or infinitival clause, for example, is not different in kind from the choice between two different nouns or prepositions. Once the lexical items to be used in a given derivation have been chosen and a particular clause type has been built, this choice then interacts with other factors relevant to further syntactic structure building, permitting certain structures and excluding others.

A lexicalist approach to clause-type differentiation commits us to a particular logic for explaining phenomena that correlate with clause type. The theory of nominal licensing developed in the context of Government-Binding Theory and its descendants offers a good illustration, in the domain of the finite/non-finite distinction. The overall theory presumes that the lexicon makes available a repertoire of items that can be used to build either a finite or a non-finite clause. The choice between these is free, but has immediate implications for the status of that clause's subcomponents — especially its subject. If a finite clause has been built, the subject is case-licensed by the T or Infl of the clause, and (unless it needs to undergo Ā-movement or cliticization) requires nothing further. If an infinitival clause has been built, however, its subject is not licensed within the infinitive, and must rely on some other element for case-licensing — which may mandate further operations such as raising of the embedded subject into a higher clause. These raising operations, in turn, are restricted (by a general "last resort" property of movement) to situations in which the absence of a local licenser for the subject renders the raising mandatory. Consequently, when the subject faces no licensing problem, as is the case in a finite clause, raising is blocked. Lexical choice occupies the "driver's seat" in proposals such as these. One a particular choice of lexical items has yielded

a finite or a non-finite clause, the rest of the syntax is obliged to deal with the consequences of its decision as best it can.

But it is not inevitable that all clause-type distinctions should be a matter of random lexical choice, nor is it inevitable that lexical choice should occupy the driver's seat in explaining correlations between phenomena such as raising and finiteness. And indeed, the lexicalist approach to clause-type differentiation is not the only approach that has been explored in generative grammar, nor was it the first. In the first decade and a half of generative syntax, most work that made reference to clause type adopted a very different approach, which I will call *derivationalist*, pioneered by Lees (1963) and Rosenbaum (1965, 1967), among others. In these derivationalist approaches, the differentiation of clauses into subtypes such as finite and non-finite was not explained as a consequence of lexical choice, but rather as a by-product of other syntactic operations. In early derivationalist work, the correlation between raising of an embedded subject and clausal non-finiteness, for example, did not result from an already-built infinitival clause forcing the movement to take place. Instead the non-finiteness of the source clause in raising constructions was treated as a *consequence* of the raising operation — the infinitivization of an initially full finite clause as an obligatory by-product of the movement. A similar logic governed early accounts of the correlation of non-finiteness with control in English and many other languages. Like subject raising, the operation that yielded a controlled subject in early derivationalist theories ("Equi-NP Deletion") had infinitivization as a by-product. Even English *for*-infinitives could be derived from finite counterparts in this research tradition by a transformational rule that inserted *for-to*, with the infinitivization of the clause as a by-product of that process.

At the beginning of the 1970s, however, the field abruptly and overwhelmingly abandoned derivationalist approaches in favor of a lexicalist alternative. This happened for very good reasons: a set of forceful arguments advanced for the lexicalist approach by Kiparsky and Kiparsky (1971) and by Bresnan (1972) (henceforth **K&K/B**). These arguments rested on two key observations. The first concerned selection:

(2) *Clause-type differentiation and selection:* Different predicates select for different clause types.

This observation had a compelling implication in the context of the model of syntax that K&K/B presupposed, the so-called Standard Theory of Chomsky (1965). In this model, both the choice of lexical items and basic structure building (the work done by External Merge in more modern approaches) took place in a *Base Component* that derivationally preceded the *Transformational Component* within which movement and deletion rules applied. Because movement was assumed to leave nothing behind in the source position (neither traces nor copies formed part of the theory), the selectional requirements of a lexical item had to be enforced at the interface between the Base Component and the Transformational Component, the level of *Deep Structure* — as a matter of logic. For this reason, it followed inevitably from (2) that the clause types in question must already be differentiated in the Base Component, and could not be a by-product of transformations such as Raising.

The second key observation concerned interactions with semantics:

(3) *Clause-type differentiation and semantics:* The choice of clause-type has semantic implications.

In the model assumed by K&K/B, Deep Structure also provided the input to semantic interpretation: the so-called *Katz-Postal Hypothesis* (Katz and Postal 1964). This assumption too was a matter of some logical necessity, since deletion and traceless movement could eliminate material that was obviously relevant to semantics. With the Katz-Postal hypothesis as background, the observation in (3) provided a second strong argument in favor of the differentiation of clause-types in the base component, eliminating any possibility that clause-type differentiation could be a by-product of movement operations (or any other

process that took place later than Deep Structure). As Kiparsky & Kiparsky (p.172) put it, "the error [of previous approaches] is that different types of complements (*that*-clauses, gerunds, infinitives) have all been assumed to have the same deep structure, and hence to be semantically equivalent" — their "hence" justified by the architecture of the syntactic model assumed as backdrop.

Since K&K/B's reasoning was absolutely watertight in the context of a then-standard model of syntax, the widespread immediate acceptance of their results should come as no surprise. Twenty-first century readers of this narrative may already have noticed, however, that the properties of the Standard Theory model most crucial to K&K/B's arguments were prominently and fatally challenged in the years immediately following their work. The development of "trace theory" in the 1970s removed the argument that selection and semantic interpretation were properties of Deep Structure (as does the later reconceptualization of trace-leaving movement as Internal Merge). The discovery that Internal and External Merge are interspersed (Lebeaux 1990, 1991; Chomsky 1993, 1995b, chapter 2) eliminated the very possibility of Deep Structure as an interface between two components no longer thought to be distinct. Though the conjunction of the Standard Theory notion of Deep Structure with K&K/B's observations provided an invincible argument against derivationalist theories of clause-type differentiation, the argument disappears entirely if Deep Structure does not exist and movement and deletion can precede rules of semantic interpretation and selection. In the wake of these developments, the observations in (2) and (3) can no longer be taken to support the lexicalist view over its derivational predecessor.

This conclusion does not entail that the lexicalist approach to clause type is wrong, of course, even if it does eliminate arguments specifically in its favor. But at the very least, the abandonment of Standard Theory should have sparked a reopening of the questions that K&K/B's work were thought to have settled.

That is not, however, what happened. Instead, the field as a whole continued to assume K&K/B's conclusions, presupposing without further discussion that lexical choice is the factor responsible for the differentiation of clause-type. In every actively pursued syntactic research tradition familiar to me, an English infinitival clause, for example, is presumed to be an infinitive from the start, the result of a set of lexical choices that includes *to* but not ±Past or a modal. The entire look of today's syntactic theories reflects this assumption — not only proposals about movement and nominal licensing developed within Government-Binding Theory and its successors, but also their counterparts in other research traditions as well. The fact that the arguments in favor of the lexicalist presuppositions of this work no longer hold appears to have gone entirely unnoticed.

The main goal of the present work is to reopen the discussion that K&K/B once seemed to have settled, and to explore the possibility that standard approaches to certain instances of clause-type differentiation have had their logic backwards for over past four decades. In the spirit of the earliest proposals by Lees and Rosenbaum, we will ask whether crucial distinctions among clause-types might arise as a by-product, rather than a trigger, of the syntactic operations with which they correlate. For example, it might be the raising of a subject from an embedded clause to a higher A-position that causes the infinitivization of an embedded clause — not the building of an infinitive that forces the subject to move. At the very least, it is worth asking what a contemporary theory of clausal syntax might look like if reconstructed around this alternative premise.

In fact, I will argue for a stronger conclusion: that for certain key distinctions — especially the finite/non-finite distinction — the road not taken was the right road, and that the standard lexicalist approach to these distinctions should be rejected in favor of an updated derivational account. I will propose that the finite/non-finite distinction, along with some others, is actually a distinction in clause *size*. An infinitival complement to a verb like *consider* on this view, for example, is just like a full finite CP except for the absence of several outer layers of structure. I will argue further that these layers are not missing as a matter

of lexical choice, but as a consequence of a derivational process that I will call *Exfoliation*. Exfoliation, in turn, is the language faculty's response to a locality problem that may arise in the course of the syntactic derivation. Extending the proposal, I will conjecture that the finite-non-finite distinction is just one instance of a broader continuum of clause-size distinctions produced by different degrees of Exfoliation (responding to different locality problems of varying severity) — including the distinction between finite clauses with and without an overt complementizer and perhaps some varieties of anti-agreement (Ouhalla 1993, 2005; Baier 2018). On the other hand, I will argue that some clause-type distinctions do have a lexical component (e.g. the presence or absence of an modal superstructure above CP) — but that even here non-finiteness is derivationally induced.

A variety of arguments will support these proposals. One word of warning will be useful before turning to these arguments, however. Though K&K/B's arguments for the Lexicalist approach (as well as my argument for reopening the debate) rested on observations about selection and semantic interpretation, the present work will not focus on their particular observations about *selection* (though other aspects of selection will play a prominent role), and our initial discussion will have little to say about the *semantic* side of their argument. We will focus instead on other syntactic properties that correlate with clause type, for which it will be argued that the best explanation requires a derivational theory of clause size differences.

Concerning selection, the reader should not enter the discussion with the idea that selection for particular sizes of clauses is in any sense a "bad guy" that the new proposals sketched here can dispense with. Exactly the opposite will turn out to be the case. Selectional properties will play a crucial role in distinguishing lexical items within and across languages, and considerable attention will be paid to these differences at several points in the discussion below. Crucially, however, these selectional properties hold post-Exfoliation, as permitted by contemporary models of grammar, and much of their explanatory force will come from this fact in the novel theoretical setting that I develop in the next chapter and beyond.

Concerning the semantic properties attributable to nonfinite clauses that distinguish them from their finite counterparts, we will have something new to say in the final chapter of this monograph, where I will develop a new explanation (building on work by Wurmbrand 2014) made possible by the syntactic discussion that preceded it. If nonfinite clauses result from the elimination by Exfoliation of the outer layers of an originally finite clause, the hearer of a nonfinite clause has the task of "reverse engineering" the speaker's derivation that produced such a clause — and thus positing an identity for tense features that have no exponents in the surface string due to the Exfoliation rule. I will propose an "unambitiousness restriction" on this reverse engineering process that accounts for some of the key semantic differences between what can be expressed by a finite clause and its nonfinite counterparts (at least in English).

We now turn to the syntactic arguments that favor a derivational approach to clause size over the standard lexicalist alternative.

Chapter 2

Nonfinite clauses

2.1 The correlation between clause size and raising: lexicalist approaches

I will use the term **R1** for the construction traditionally called *Raising to Subject,* and I will use the term **R2** for the construction variously described as *Raising to Object* and *Exceptional Case Marking* (ECM). In this section, I review the important properties of English R1 and R2 and their treatment in standard lexicalist theories of finiteness. I then introduce the derivational alternative that will be explored in this monograph. Since the correct analysis of R2 is less obvious than R1, with a significantly more fraught history of debate, I will start with R2.

The central puzzle of English R2 is the observation that the nominal that immediately follows the higher verb behaves in some respects like the subject of the embedded clause, but in other respects like an object of the higher clause:

(4) **R2: postverbal nominal behaves like lower-clause subject**

a. Mary judged there to be a good reason for the meeting. *expletive* there

b. The detective proved it to have been raining when the murder was committed. *meteorological* it

c. Bill believes the shit to have finally hit the fan. *idiomatic reading available*

(5) **R2: postverbal nominal behaves like higher-clause object**

a. Mary believed ✓me/*I to have solved the problem. *object vs. subject pronoun form*

b. Sue$_i$ proved ✓herself/*her$_i$ to be a capable leader. *upper-clause binding domain*

A natural resolution to the puzzle posits movement of the postverbal nominal from subject position in the lower clause to some position in the higher verb phrase, as first proposed by Rosenbaum (1965, 1967). The proposed movement, however, is string-vacuous in simple cases — licensing the suspicion that the embedded subject might not raise in to the higher verb phrase after all, and that the observations in (4) and (5) should be reconciled in some alternative manner (Chomsky 1973, 1981).

Postal (1974) argued at length against such an alternative, and in favor of movement. He noted, for example, that when the higher verb phrase is modified by a low postverbal adverb, this adverb *follows* the crucial postverbal nominal in the R2 construction (pp. 146-7):

(6) **R2: postverbal nominal precedes higher-clause low VP adverbs**

a. Mary proved Sue conclusively to deserve the prize.

b. She believes Bill with all her heart to be the best candidate.

c. Somebody found Germany recently to have been relatively justified in the *Lusitania* sinking. (Postal 1974 p. 147)

Bach (1970) (as discussed by Postal, 120-124 and Lasnik and Saito 1991) presented additional evidence from anaphora that the crucial postverbal nominal in an R2 construction may bind into a higher-clause adverbial phrase:

(7) **R2: postverbal nominal c-commands low elements in higher clause**

a. *Principle C*

*John believes him$_i$ to be a genius even more fervently than Bob$_i$'s mother does.

cf. *John believes that he$_i$ is a genius even more fervently than Bob$_i$'s mother does.*

b. *Principle A*

The DA proved the defendants$_i$ to be guilty during each other$_i$'s trials.

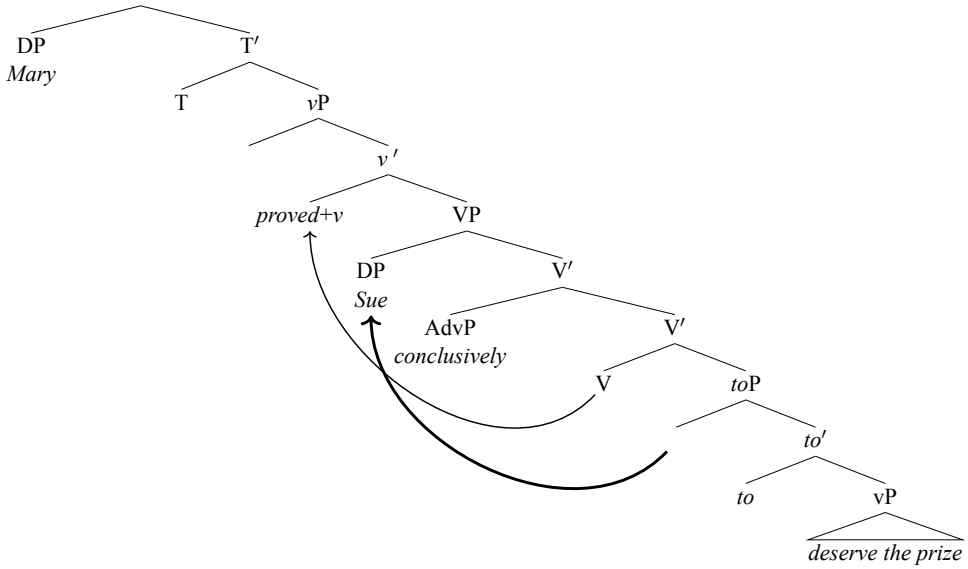
cf. **The DA proved that the defendants were guilty during each other's trials.*

Taken together, these arguments and others like them support the view that the postverbal nominal in R2 constructions has indeed raised from subject position in the embedded clause to a position in the higher verbal domain. In this position, it may precede and c-command a VP-level adverb in the higher clause, while still following the higher verb.[1] If this view is correct, the next important question concerns the position to which it raises. A proposal compatible with other findings concerning verb phrase structure analyzes the R2 construction as involving two instances of movement (building on proposals by Johnson 1991 and Lasnik and Saito 1991): (i) raising of the embedded subject to form a specifier of the higher V (crossing any VP-level adverbs that may have been merged), and (ii) raising of V to *v* in the higher clause (crossing the raised embedded subject). The analysis is exemplified in (8):[2]

1. Neeleman and Payne (2019) present data from scope reconstruction that they suggest argues against analyses of Postal's adverb data in which it is R2 movement of the subject into the higher VP that places it to the left of higher-VP adverbs. In particular, they claim that readings that require the subject of the embedded clause to reconstruct into the embedded VP are absent. They explain this with an analysis along the lines of Pesetsky (1982b, 346-347, fn. 10) according to which the subject of the embedded clause remains within the subordinate clause, the higher-VP adverb is right-adjoined to the VP, and the predicate phrase of the subordinate clause (minus the subject) extraposes rightward over that adverb. Given the VP-internal subject hypothesis, the extraposed predicate phrase contains a trace of the subject — i.e. is an instance of remnant movement. Consequently the subject may not reconstruct into this VP, as an instance of an effect first observed for other instances of remnant movement by Barss (1986). Neeleman and Payne's examples of alleged blocked reconstruction involve inverse scope between embedded subject and object, which has been argued by Lebeaux (1991), Hornstein (1995), and Katz et al. (1998) (among others) to require the subject to reconstruct into the verb phrase (where it can be outscoped by the object adjoined to it). I am not convinced that the blocking of inverse scope that they document will not yield to appropriate intonation. But more important, I believe reconstruction below an intentional predicate is clearly possible in Postal-type examples, in contrast to Barss environments: e.g. *She believes a new approach quite sincerely to be needed* vs. *#How likely to be needed is a new approach?* For this reason, though Neeleman and Payne's findings merit further exploration, I will continue to assume that Postal's data should be analyzed as a consequence of subject raising over a higher adverbial, rather than rightward extraposition of a predicate phrase stranding its subject within the embedded clause.

2. I have labeled projections of *to* as *to*′ and *to*P, rather than T′ and TP with malice aforethought, for reasons that will become clear in section §2.2

(8) **Analysis of R2**



Crucially, the original subject of the infinitival clause in an R2 configuration may not follow the main-clause adverbial in such constructions:

(9) *Mary proved conclusively Sue to have committed the crime.

With Koizumi (1993, 118; 1995, 34), I will take this fact as evidence that raising of the subject to the higher VP is an obligatory component of an infinitival R2 construction.[3]

Additional support for the verb movement crucial to this analysis is provided by the behavior of the R2 verb-particle predicate *make out* 'represent'. Johnson (1991) argued that a verb-particle construction with verb-object-particle order (e.g. *throw the trash out*) arises when the verb strands a particle originally attached to it by leftward movement over the direct object to a position we can now identify as *v*— a proposal modeled on the analyses of German and Dutch separable prefixes in verb-second constructions by Bierwisch (1963, 34-35) and Koster (1975). If these proposals are correct, the position of the stranded particle diagnoses the original position of the verb. It is therefore significant that in an R2 construction with a stranded particle, the raised subject follows the main-clause verb but precedes the particle (and main-clause VP adverbs), as predicted by the analysis sketched above (cf. Johnson 1991; Koizumi 1993, 1995; and Lasnik 2002, 2003, building on Kayne 1984b):[4]

3. This claim is controversial, however, as debated by Lasnik (1999) and Bošković (2002), among others. I return to this controversy in section 4.2. See also footnote 26 below.

4. If we adapt Johnson's analysis of English particle-stranding to a view of the verb-phrase that distinguishes only VP and *v*P, the stranding of a particle to the right of the direct object entails either a head-final linearization of VP or movement of the complement of V to the specifier of VP (perhaps problematic, as discussed by Abels 2003). An alternative analysis closer to Johnson's original proposal would posit some distinct maximal projection between VP and *v*P as the actual landing site of object raising in both particle-stranding and R2 constructions, rather than VP itself. If the possibility of hosting an adverb below *v*P is restricted to VP, the impossibility of adverbs intervening between the higher verb and the raised subject of an embedded clauses would also follow from this friendly amendment to the proposal sketched in (8). For the sake of simplicity, however, I will not adopt this alternative here, and will continue to assume that V itself provides the landing site for subject raising in the R2 construction.

(10) Mary made Sue out (conclusively) to have committed the crime.

If English R2 uniformly involves movement of the embedded subject, it is of course a twin of R1, where movement is not in doubt, since it is not string-vacuous. What ingredients does the standard lexicalist theory need to explain the core properties common to R1 and R2 constructions?

First, if movement of an element α requires a relation between a c-commanding *probe* with an EPP property and a featural requirement that α satisfies (as extensively argued over the past two decades), the availability of R2 movement to V indicates the presence of an appropriate probe on V.[5] This probe is limited to a specific class of verbs such as (the active form of) *believe*, a topic to which we will return. Similarly, we may assume that the possibility of R1 movement in a given environment indicates the presence of an R1 probe on a head higher than V, a probe also limited to certain predicates. Anticipating future discussion, I will assume that this head is *v*, so that R1 movement proceeds through an edge position in *v*P. Continuing to anticipate future discussion, I also assume that this probe on *v* is distinct from the Ā-probe that *v* also bears.

(11) **Probes relevant to movement of an embedded subject (***background assumption: lexicalist***)**
   a. R2 probe on V (∈ *believe, consider, judge*...)
   b. R1 probe on *v* (∈ *seem, appear, tend*...)
   c. Ā-probe on *v*

Restricting our attention for now to (11a-b), we note that the presence of these probes *permits* R1 and R2 movement to take place, but what accounts for the fact that this movement is *obligatory*, in lexicalist approaches? Presupposing the free generation of infinitival clauses, a standard proposal holds that the production of an infinitive has consequences for the case-licensing of the embedded subject. Specifically:

(12) **Case-licensing account of the obligatoriness of subject raising in R1 and R2 (***background assumption: lexicalist*)
   1. The subject position of the infinitival clause is not case-licensed, which means that if the subject remains in situ, the Case Filter (or its counterpart in related frameworks) is violated…
   2. …unless the subject moves to a case-licensed position

Besides stipulating that a non-finite clause fails to provide a clause-internal licenser for its subject, the theory must also stipulate in some fashion that unaccusative and passive *v*Ps, *a*Ps and *n*Ps fail to provide such a licenser, in order to account for the unacceptability of examples like those in (13):

5. The discussion of movement in this work is couched in terms familiar from much recent literature: internal Merge occurs when a probe bearing unvalued features F and an EPP attribute searches its c-command domain and successfully locates a nearest goal (Chomsky 2000). Nonetheless, I believe that the results reported here are also compatible with other proposals, including the possibility that probe-goal relations act as a filter on free internal Merge (a.k.a. "Move α"; Chomsky 2015, 14) and the possibility that the need for overt movement might be explained as a consequence of more fundamental considerations, e.g. prosodic requirements (Richards 2016). What is crucial is that contact between a probe and a goal be viewed as a precondition for Internal Merge. Any proposal that includes this as a component (whether fundamental or derived from other factors) should be compatible with the proposals advanced here.

(13) **Environments posited to lack a case-licenser for a raised subject (***background assumption: lexicalist*)

a.	*It seems Mary to have solved the problem.	*unaccusative vP*
b.	*It was believed Sue to speak French well.	*passive vP*
c.	*Mary is aware Bill to be the best candidate.	*aP*
d.	*Mary's belief it to have been raining	*nP*

Another important property of R1 and R2 constructions can be stated in a lexicalist approach as (14):

(14) **Clause size requirement on Raising (***background assumption: lexicalist*)
The clause from which R1 or R2 movement takes place may not be a full CP.

The primary evidence for (14) is the fact that R1 and R2 constructions cross-linguistically are incompatible with an overt complementizer (Landau 2013, 18ff.) in a wide range of languages[6] — a generalization exemplified by French, and Italian (Kayne 1981, 351-3; 1984a, 106), Hebrew (Landau2002, 474-5 footnote 9), Romanian (Landau 2013, 19), Moro (Jenks and Rose 2017), and Lusaamia (Carstens and Diercks 2009), among others. There are some apparent counterexamples to (14) (see Ura 1995, chapters 2-3), two of which, Mongolian (Fong to appear) and Zulu (Halpert 2012, 2016, 2018), will be discussed in some detail in section 4.3. I will argue that these languages, at least, are exceptions that prove the rule, so that the generalization behind (14) could turn out to hold without exceptions.

Finally, in many, but not all languages, the clause from which R1 or R2 subject movement takes place must be non-finite, i.e. lacking tense and subject-agreement morphology. This has been taken to indicate that the correlation between the absence of case licensing for an unmoved nominal and the possibility of R1/R2 movement for that nominal is two-way — i.e. not only does the absence of in situ case licensing entail that the subject must raise, but also the availability of in situ licensing of the subject blocks it from raising. This is the "last resort" concept mentioned in chapter 1:

(15) **A-movement as a last resort (***background assumption: lexicalist*)
A-movement of a nominal (including R1 or R2 movement) is possible only if failure to move would leave the nominal unlicensed.

A variety of proposals have been advanced that embed (15) in a broader generalization or derive it from more general principles (such as the Activity Condition of Chomsky 2000, p. 123) — leaving open the question of why some languages appear to disobey (15), allowing raising from a case-licensed subject position (dubbed "hyperraising" by Ura (1994)), a topic to which we return in section 4.3.

Notice how the lexicalist presuppositions of the past four decades color the entire standard approach to the problems of R1 and R2 constructions. With the finiteness of a clause and the presence and absence of a complementizer layer presumed to result from free lexical choice, the proposals in (11)-(15) are all designed to jointly answer the following question: "Given that the derivation has built an infinitive, how does the system solve the problems that follow from this choice?"

But is this the right question in the first place? In the next section, I present a derivationalist alternative, in which it is the raising of the embedded subject that triggers infinitivization, by stripping away the CP and TP layers from a previously full finite CP — rather than the free building of an infinitive that triggers the raising. This alternative seeks to answer a different question from the standard approach: not how

6. Landau contrasts this observation concerning R1 and R2 with control constructions that often do permit an apparent overt complementizer (as Idan Landau, personal communication, reminds me in this context). In section 2.4.3, control will end up presenting a more complex picture for us that has the potential to cloud this generalization.

to solve the problems created by freely building an infinitival clause, but rather "under what circumstances can a full finite CP be legally reduced to an infinitive?" After presenting this derivationalist alternative, I will compare the two approaches at some length.

2.2 A derivationalist theory of infinitival clause creation

2.3 Exfoliation

At the heart of the derivationalist alternative developed here will be the hypothesis stated informally in (16):

(16) **Full CP hypothesis**
Every embedded clause is built by Merge as a full finite CP, and may be reduced to a less-than-full clause only as a consequence of later derivational processes.

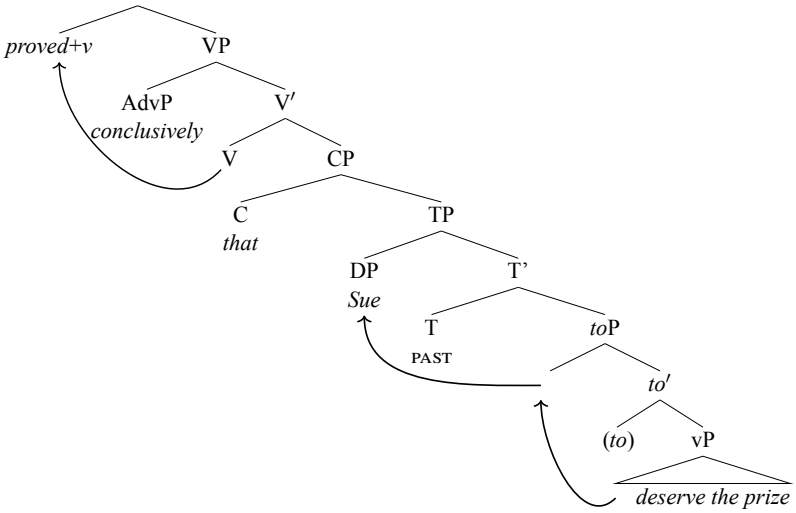
To clarify what "reduced" means (for English, at least), I must posit a small innovation concerning the position of the infinitival marker *to* in clause structure. Because *to* is in complementary distribution with ±Past and the modals such as *can* and *will*, it is common to view *to* as an instantiation of T — so that the complementarity of *to* and these other elements follows from the general fact that a clause contains only one instance of T. I propose instead that *to* is a distinct head, merged lower than T in the clause.[7] The complementarity of ±Past and modals with *to,* on this view due to the restriction in (17), to be restated shortly:

(17) **Overtness of *to* (preliminary)**
English *to* is overt only when not c-commanded by T within its clause.

An embedded *that*-clause with no raising of the subject will thus have the following structure, where the parentheses surrounding *to* indicates its non-overtness. I also propose that *to*, like T, bears a φ-probe with an EPP property, so that the subject *Sue* moves successive-cyclically, forming a specifier of *to*P before moving to form the specifier of TP in a clause that remains finite:

7. It is an interesting question, not explored here, to what extent the clausal spine positions posited in this work correspond to the hierarchy of positions posited by Rizzi (1997) (and subsequent work in the "cartographic" research program). Given its relative location and its status as a host for *to*, one might identify our *to*P with Rizzi's (1997)TP and our TP with Rizzi's FinP. I will leave as a topic for future work, however, the reconciliation of these proposals. I have deliberately chosen the name "*to*P" to emphasize the fact that we cannot yet supply a *raison d'être* for this category independent of the results reported here (also an issue, I believe, for Rizzi's FinP).

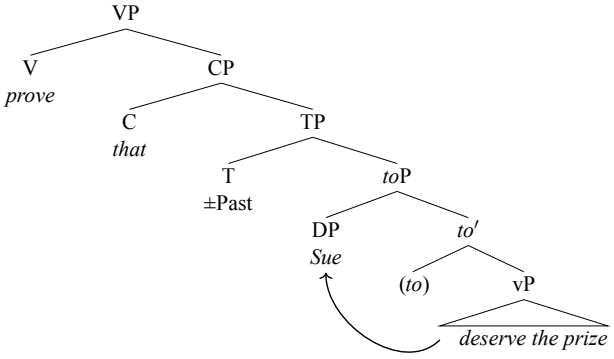
(18) **Structure of full finite CP (including *to*P distinct from TP)**



I will suggest later that (17), though in need of further justification, is not *ad hoc*, but is an English instance of a phenomenon found in other languages as well — crucial to the analysis of the much-discussed *que/qui* alternation in French, and counterparts in languages such as Bùlì and West Flemish.[8]

Now let us consider a variant of (18) in which the subject *Sue* has raised to form a specifier of *to* within the embedded clause, responding to an EPP property of *to*, but has not raised further to form a specifier of T, and the derivation has progressed as far as the point at which the higher R2 verb has merged:

(19) **Subject moved only as far as *toP***



Take it as a premise that *prove* in the derivation under discussion bears an R2 probe, i.e. a φ-probe with an EPP attribute. Assume further that the embedded CP does not itself satisfy the needs of this probe (for reasons we shall return to), rendering *Sue* the closest potential goal for this probe. The CP phase boundary, however, separates *Sue* from this probe, and *Sue* does not occupy the edge of this phase. As a conse-

8. Even internal to English, back-handed support for structures like (18) and the claim in (17) can be found in the existence of the semi-modal constructions *ought to* and *used to,* in which *ought* and *used* can be viewed as T-elements that exceptionally fail to trigger the silent version of *to,* i.e. as exceptions to (17). *Ought to* in particular shows other behavior typical of English modals, including movement over the subject (rather than *do* support) in matrix questions (*Ought we to read this book?*) and non-triggering of *do* support under sentence negation (*Bill ought not to have read this book*). The status of *used* in *used to* is less clear, since though it can act like *ought* with respect to negation (*Sue used not to read books*), *do* is also possible (*Sue didn't used to read books*) and movement in matrix questions is impossible (*Did you used to read books vs. *Used you to read books*).

quence, common ideas about the impenetrability of phases might prevent the R2 probe on *prove* from finding *Sue* across the CP boundary. I propose to the contrary that the CP is *not* a barrier to an external probe's ability to find a potential goal — so the R2 probe on *prove* does find *Sue* in (19). Call this property *phase penetrability.* Nonetheless, I also propose that one aspect of the standard view of phase *im*penetrability was correct. In order for the probe to successfully trigger movement of its goal across a clause boundary, that goal must indeed occupy the edge of the embedded clause. For this operation at least, a phase is *im*penetrable:[9]

(20) **Probing across a clause boundary**

a. **Phase penetrability:** A probe π with an EPP property can locate a goal γ across a CP boundary, even if γ does not occupy the edge of that CP…

b. **Phase *im*penetrability:** …but γ can move to π only if it occupies the edge of its clause.

Given (20), *Sue* in (19) can be located by the R2 probe on *prove.* Unless some operation places *Sue* at the edge of the embedded clause, however, it cannot satisfy the EPP requirements of the probe.

I will argue that an operation with this property exists: *Exfoliation*. Exfoliation takes as input a situation like (19) in which a goal located by a probe should occupy the clausal edge but does not — and removes just enough structure from the periphery of the clause to situate the goal at that edge. In (19), where the subject *Sue* has moved to the specifier of *to*P but no further, Exfoliation applies to reduce the embedded phasal CP to a *to*P whose edge is occupied by *Sue,* as required by (20b):

(21) **Exfoliation**

a. **Structural Description:** ... β ... [$_{\text{YP (phase)}}$ ... [$_{\text{γP (non-phase)}}$ ... α ...]], where

(i) YP is the phase that dominates α but not β,

(ii) α occupies the edge of γP,[10] and

(iii) a movement-triggering probe on β has located α as its goal.

b. **Structural Change:** Replace YP with γP, which takes the phasal property of its predecessor.

In (19), if the higher V bears an R2-triggering φ-probe for which the specifier of *to*P is its goal, Exfoliation applies, replacing CP by the *to*P that it contains — in effect, deleting the CP and TP layers of the clause. The result is a clause whose head is *to*, i.e. an infinitive, which counts as phasal:[11]

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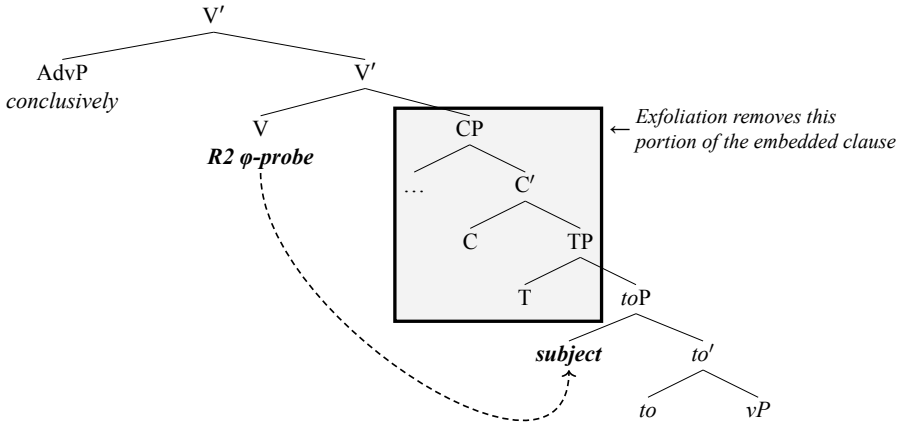
9. Most of our discussion will focus on clausal phases, turning to phasal *v*P only in chapter 6 — hence the cautious formulations in 20, which mention only clauses.

10. For present purposes, we can define *edge of α* as the XP immediately dominated by the maximal projection of α.

11. As Elise Newman (personal communication) pointed out, if the Exfoliated structure did not inherit phasal status, it would be sufficient to eliminate the CP layer to render a subject occupying the specifier of *to*P accessible to a clause-external probe — which is the wrong result, as will become clear. Details of the Exposure condition introduced below (but developed further throughout this work) will also turn out to motivate this conclusion.

(22) **Exfoliation**



We can now restate (17) more satisfyingly as specifying overtness for *to* only when Exfoliation has made it the head of a phase, a property we may call *exposure.* The definition of exposure will be revised in section 3.3.2 below, but (23) will do for now:

(23) **Exposure (version 1)**
α is *exposed* iff it heads a phase.

(24) **Overtness of *to* (final)**
English *to* is overt only when exposed.

Recall from (16) that all clauses are initially built as full finite CPs, and that an infinitival clause is created only by a later reduction of this full clause. This analysis entails that no clause should present a case-licensing problem for its subject of the sort that motivates R1 and R2 in standard lexicalist theories, eliminating the availability of case-licensing as an explanation for the obligatoriness of R1 and R2 from an infinitival clause.

What then does account for the correlation between subject movement and non-finiteness in R1 and R2 configurations? The answer lies in one additional important claim: that Exfoliation is the *only* grammatical operation that can reduce a full finite clause to an infinitive.[12] Exfoliation in turn applies when its Structural Description is met, and not otherwise. If two elements are in a probe-goal relation, but not separated by a phase boundary, or if two elements are in a probe-goal relation, but the goal occupies the edge of a phasal rather than a non-phasal category — Exfoliation is not triggered, and an infinitive is not produced. In sections 2.5.1 and its immediate successors, I will argue that unacceptable infinitival clauses whose status has been attributed to case theory should instead be understood as instances of illegal Exfoliation (that is, as instances of infinitival clauses not produced by (21)), and show how this proposal solves a number of problems that arise for case-theoretic accounts of R1 and R2.

It is the claim that infinitival clauses are derived from full finite clauses by Exfoliation, which is triggered by movement, that distinguishes the work presented here from other proposals in the literature that have points of similarity with it. Chomsky (1981, 66 and passim), for example, proposed that a rule of "S̄-deletion" (S̄ ≈ CP) obligatorily removes the complementizer layer from the embedded clause in what

12. The phenomenon of *restructuring* (Aissen1970; Rizzi 1978) poses a challenge for this proposal, since it appears to involve complementation with clausal semantics, smaller than CP but not self-evidently motivated by the configuration specified as the Structural Description for Exfoliation. To the extent that restructuring in some languages such as German may involve a clause even smaller than *v*P (Wurmbrand 1998, 2001), it is possible that some other factor creates or licenses this structure. I will leave discussion of restructuring that might involve larger domains (Wurmbrand 2015) for future work — and will (with regrets) ignore such constructions here.

we have been calling R1 and R2 constructions, for reasons internal to the theories of case assignment and trace-licensing that he developed in that work. An additional point of similarity can be discerned in the fact that what was crucial about S̄-deletion was the fact that it rendered the embedded subject crucially accessible to clause-external processes. At the same time, however, the non-finiteness of the embedded clause in examples like those discussed above was not viewed as a result of S̄-deletion, but as a property already in place when S̄-deletion applies, a matter of lexical choice. Indeed, it was in this context that the case-theoretic proposals concerning the subject position of infinitival clauses were developed that I argue against in section 2.5 and the sections that follow.[13]

There is a deeper potential kinship between the work reported here and recent proposals for "structure removal" by Müller (2016, 2017). Müller argues for feature-driven structure removal as a natural inverse of feature-driven structure building — in the context of a theory in which heads bear a stack of features triggering both kinds of operations. As a consequence, a head that bears a feature motivating Merge of some element with it may host another feature lower on its stack that motivates the removal of α and its replacement with the complement of α. Though Müller does not explore structure removal as a source (much less the sole source) for non-finite structures, his work could be extended in that direction. A crucial difference between his work and ours, however, concerns the trigger for structural removal: the selecting head for Müller, a probe triggering extraction of the subject (and similar elements, as discussed below) for us. To the extent that the arguments developed throughout this work are correct, they will constitute an argument for our approach over Müller's; but the similarities between the two proposals are strong enough to permit the adaptation of many specific analyses from one approach into the other. An example will be offered in chapter 6, where I briefly sketch a way of adapting Müller's interesting and compelling "structure removal" analysis of passive voice into the Exfoliation framework developed here.

2.4 Salient issues

This proposal raises a number of questions and issues that are obvious enough to occur to the reader at this point, and salient enough to merit a brief discussion. This section briefly deals with these issues, in no particular order.

2.4.1 *Alternation with finite clause*

The first concerns the fact that R2 forms part of an *alternation*. What permits a finite *that*-clause to co-exist as an an alternant with R2 in pairs such as (25a-b)?

(25) **R2 alternates with full finite CP**
   a. Sue believes Mary to have solved the problem.
   b. Sue believes that Mary has solved the problem.

The existence of such pairs might simply indicate that the R2 probe on V is optional — and a similar conclusion could be drawn for the R1 probe with verbs like *seem,* which show a similar alternation:

(26) **R1 alternates with full finite CP**
   a. Mary seems to have solved the problem.
   b. It seems that Mary has solved the problem.

13. In more recent work, Chomsky (2008) continues to assume smaller-than-CP complementation as a concomitant of R1 and R2, and derives from more general considerations (feature inheritance by T from C) what was stipulated in earlier work: that the subject position of an infinitive is case-theoretically special, motivating movement from that position. Once again, the background concerning non-finite complementation is crucially lexicalist, and the arguments presented here against lexicalist case-theoretic explanations for the properties of R1 and R2 apply equally to this variant as well (and render unnecessary in the first place the notion of feature inheritance).

Alternatively, however, such alternations might indicate that both the subject of a CP complement and the CP itself can serve successfully as goals for an R2 or R1 probe — with Minimality failing to prefer one over the other in R2 and R1 configurations because one of these possible goals (the complement clause) dominates the other (its subject).[14] This alternative view suggests a particular treatment of English expletive *it* and its clausal associate. If an R1 probe on *v* selects a complement CP as its goal, it may satisfy its EPP property by merging a doubling *it* as its specifier, as in (26b), rather than a full copy of the full embedded CP.[15] With an R1 verb like *seem*, on this view, the doubling option must be stipulated to be obligatory (since *seem* may not take its CP argument as its surface subject), but other R1 predicates such as *likely* permit internal merge of the full CP as well — a difference that I will not attempt to explain here.[16]

For reasons that will become clearer in section 2.5.3, I will assume the correctness of this alternative proposal — i.e. that a complement CP and its subject compete to serve as a goal for an R1 or R2 probe, with the use of expletive *it* in English reflecting one outcome of the the choice of CP as goal.

2.4.2 *Nominative vs. accusative subjects*

Another issue concerns the NOM-ACC alternation that correlates with the absence vs. presence of R2 in pairs like (25a-b), as discussed in connection with English pronouns in (5a), and robustly attested in rich case-marking languages like Icelandic. I will assume that the embedded subject receives NOM case before the R2 probe triggers raising, and that NOM is replaced or overwritten by ACC in the high clause. The distribution of anaphors and pronouns that have undergone R2 movement documented in (5b) will be discussed in section 2.6.1.

2.4.3 *Control*

Another obvious question concerns infinitives whose subject is the target of *control*, rather than R1 and R2 as normally understood. We will return to this topic in section 5.2, and will (with apologies) pretend that control infinitives do not exist until that point. Furthermore our discussion will be tentative and incomplete, a signpost for future research rather than a comprehensive proposal — an insufficiency of the present work that it is only fair to warn about in advance.

2.4.4 *Subject as specifier of toP and the EPP property of T*

Assuming that subjects originate within *v*P (Kitagawa 1986; Kuroda 1985, 1988; Sportiche 1988), we must ask why it is even possible for the subject to stop at *to*P, without raising further to form a specifier of TP — given that T has an EPP property that should force the subject to raise further. Here Exfoliation itself provides the answer. If the unacceptability of a finite clause in which the subject has raised incompletely is due to an unsatisfied EPP property of T, but T is deleted from the structure as a consequence of Exfoliation of the CP and TP layers — we are not surprised to see the violation rendered undetectable, since the bearer of the unsatisfied EPP feature has been eliminated in toto. This is the logic of "salvation by deletion", familiar (though controversial) from work on sluicing (Ross 1969; Chomsky 1972), verb movement (Lasnik

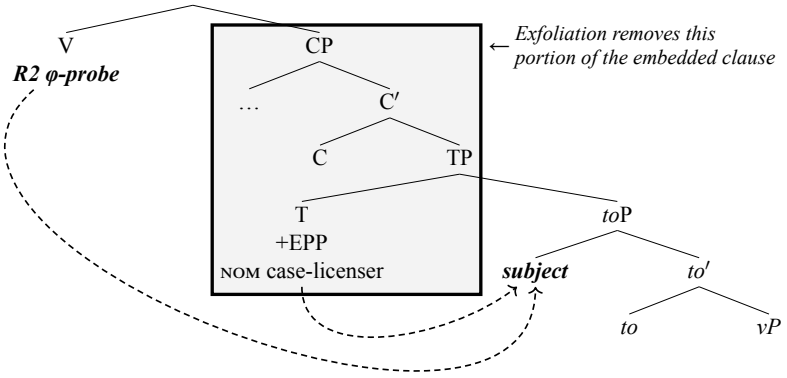
14. The assumption that two goals count as equidistant from a probe if one dominates the other contradicts the key premise of Kitahara's (1994) explanation of the *Müller-Takano* generalization (Müller 1993, 1998; Takano (1994)). This generalization blocks remnant movement derivations in which the two instances of movement involve the same kind of probe. Kitahara's explanation relies on Minimality treating a potential goal as closer to its probe than any potential goal that it dominates. I leave this contradiction as an unsolved problem.

15. Wu (2017) offers a independent argument, building on Hartman (2011), that expletive *it* originates within the verbal domain, from where it raises to form the specifier of TP (rather than being initially merged in the TP system, as proposed by Chomsky 2000). See also Deal (2009) for arguments that expletive *there*, at least, originates as the specifier of *v*P, which lends plausibility to a comparable analysis for *it*.

16. An R2 predicate also permits the satisfaction of its EPP feature via merge of a doubling *it*, but this choice yields a factive interpretation (which makes it incompatible with some predicates): e.g. *Sue doesn't believe it that Mary solved the problem* (which presupposes the truth of its complement). I will not attempt to account for this fact here.

2000, chapter 3) and other phenomena.[17] At the same time, the presence of finite T prior to Exfoliation is sufficient to case-license the subject in specifier of *to*P, by downward probing of the sort familiar from work over the past two decades:

(27) **A fuller picture of infinitive-producing Exfoliation**



Of course, we must also ask what happens if the subject *does* raise to form a specifier of T and is contacted by a probe in a higher clause. We return to that topic in chapter 3, and ignore this question until then. Our most immediate task is showing that an Exfoliation approach to the creation of infinitival clauses is viable and solves problems that arise for the traditional lexicalist approaches. That is the topic of the next major section.

2.4.5 *What happens to specifiers of an exfoliated phrase?*

Because Exfoliation was formulated as a replacement operation in (21), it is clear that if α was a complement of a head H before Exfoliation and is replaced by a subconstituent β as a consequence of the operation, β will be the new complement of H. In effect, β inherits this position from its pre-Exfoliation predecessor, and of course all pre-Exfoliation dependents of β (its specifiers, adjuncts, and complements) remain dependents of β. Questions do arise, however, if α hosted dependents other than its complement before Exfoliation — for example, if a pre-Exfoliation CP hosted a specifier. Do such dependents disappear, or do they become dependents of β or H?

It seems clear that these dependents may remain. Consider, for example, how successive-cyclic *wh*-movement proceeds from the clausal complement of an R2 predicate in an example like (28):

(28) ***Wh*-movement from an R2 construction**
Which problem did Sue believe [Mary to have solved ___]?

If the R2 probe is a property of V, while *v* above V bears the Ā-probe responsible for extracting a *wh*-phrase from the embedded clause, this *wh*-phrase will still occupy the specifier of the embedded CP when Exfoliation is triggered by the R2 probe on V. Clearly, therefore, Exfoliation does not eliminate the specifier of the phrase it eliminates (since it is available as a goal for the Ā-probe on *v* at a later derivational stage). It must therefore reattach in some position.

Additional evidence is provided by observations of McCloskey (2000, 68 ff.) concerning the stranding of pluralizing *all* in intermediate landing sites of *wh*-movement in the West Ulster dialect of English. McCloskey famously noted that pluralizing *all* may be stranded by elements such as *who* in the specifier

17. We know independently that failure to satisfy the EPP property of T at any random point during the course of a derivation does not yield the sensation of unacceptability, since the EPP property of a head is by definition satisfied only by a Merge operation later than the one that introduces that head.

position of a declarative CP, thus supporting analyses that posit this position as an intermediate landing site for Ā-movement. In the same study, he also notes that *all* may be stranded to the right of the raised subject in an R2 construction. This follows if the position in which *all* is stranded is the specifier of the embedded clause — so long as R2 does indeed raise the subject into the higher VP, as we have assumed above.

(29) ***All*-stranding in R2 constructions (West Ulster English)**

Who did you expect/want your mother [—— all —— to meet —— at the party]?

'Who-PL did you expect/want your mother to meet at the party?'

(McCloskey 2000, 70, ex. (39a-b))

This observation also entails, of course, that the contents of the specifier of CP may remain after its host CP has been deleted. McCloskey notes that stranded *all* must follow the raised subject in examples like (29), and may not precede it. This suggests that the specifier of an exfoliated phrase may reattach as a specifier of its replacement, so that the previous specifier of CP becomes a specifier of *to*P in (29). Exfoliation might therefore be better reformulated as a replacement not of CP by *to*P in R1 and R2 constructions, but as a replacement of an intermediate projection of C by the mother of *to*, but other formulations can also be envisioned. For simplicity's sake, I will retain the statement of Exfoliation in (21), while noting separately the need for an addendum like that discussed here.[18]

Likewise, as Liliane Haegeman (personal communication) points out, successful binding of the reciprocal by the matrix subject in (30) suggests that the copy of the *wh*-phrase that originally constituted the specifier of the embedded CP remains after the φ-probe on V has eliminated this CP by Exfoliation — since this might be the only position in which the reciprocal may take *the women* as its antecedent without violating Principle A, and *these women* is not merged into the structure until *v* is merged with VP, i.e. after Exfoliation:[19]

(30) **Principle A reconstruction in R2 constructions**

Which aspects of each other do the women believe [—— Sue to have appreciated ——]?

Finally, note that I have carefully suggested that reattachment of a specifier may happen, but not that it is obligatory. This issue will not be important to the results reported in the body of this work, but will arise once again in the chapter 6, where the analysis of passive will be briefly discussed.

2.4.6 *Movement to specifier of CP and Antilocality*

An additional important question concerns the apparent inability of the subject in the configurations discussed here to move successive-cyclically through the specifier of CP position on its way to its final R2

18. In addressing a similar question arising in the context of a somewhat different proposal mentioned above, Müller (2017, 6 ff.) suggests that when a phrase αP is removed, its specifiers reattach as a specifier of the higher head that triggered the operation — rather than as a specifier of the phrase that replaces αP, as I propose here. Müller's proposal would yield the same result for McCloskey's data in an Exfoliation context only if the theory can ensure that the specifier of the exfoliated CP becomes an *inner* specifier of the higher V — so that follows and never precedes the raised subject. This could be achieved by an ordering of operations that requires reattachment motivated by Exfoliation to precede the movement that Exfoliation makes possible.

19. Omer Preminger (personal communication) notes that the argument is weakened by the possibility that successive-cyclic *wh*-movement to the matrix *v*P may permit the external argument of *believe* to bind the reciprocal in that position — if the subject may be an outer specifier, thus c-commanding the landing site for *wh*-movement. At the same time, he also points out that examples like *Which aspect of himself did Mary seem to Bill to like best*, though not relevant to the question of post-Exfoliation reattachment of specifiers, do at least point to the existence of a clause-peripheral landing site for Ā-movement out of R1 infinitives (and thus argue for an Exfoliation analysis in which such infinitives start as full CPs). Only in a position below *to Bill* but above *Mary* within the embedded clause will binding of the reflexive not run afoul of Principle A.

position within the higher VP. In the context of the work reported here, this issue will not be viewed as a minor addendum, but will assume some considerable importance in later chapters. If a feature on C has the ability to trigger successive-cyclic movement movement in constructions such as long-distance *wh*-movement, and if infinitives start their lives as full CPs (as claimed above), something must be preventing C from attracting the subject in configurations like (27). In (27) itself, if the subject stopped off in the specifier of the embedded CP without raising first to the specifier of TP, Exfoliation could not take place. The embedded clause would remain finite — and would be judged deviant, because the EPP requirements of T will not have been satisfied.

One might imagine that this derivation is blocked when the subject is an ordinary nominal because it lacks a feature such as *wh,* topic or focus that would make it a goal for an Ā-probe on C. This cannot be a general solution, however, since the subject of an R2 or R1 construction may be a moved or in situ *wh*-phrase (or may be used as a topic or focus) without changing the paradigm in any way (e.g. *Who believes who to have solved the problem*). A more general solution is needed to prevent a probe on C from attracting the subject at all. For the moment, let us simply stipulate that this pattern of attraction is blocked, by positing an *Antilocality* constraint that forbids movement to the specifier of CP unless it crosses *v*P*,* similar to proposals that have been advanced by many previous researchers (Saito and Murasugi 1998; Bošković 1994; Ishii 1999; Grohmann 2003; Erlewine 2016; Brillman and Hirsch 2014)**:**

(31) **Antilocality constraint** (*to be replaced*)
Movement to the edge of CP must cross a phase boundary.

I will argue in section 3.1 that Antilocality should be replaced by a more general "Lethal Ambiguity" condition with a slightly different character. For the time being, however, let us assume that Antilocality is correct. Antilocality and its replacement will play a crucial role at more than one point in the following discussion.

2.5 Predictions of an Exfoliation account of R2 and R1 infinitival clauses

2.5.1 *Surprising Case Filter-like effects on non-nominal subjects*

The starting point for the theory of nominal licensing proposed by Vergnaud (1976/2006) was the observation that the distribution of nominal phrases is restricted in a way that the distribution of a CP or PP argument is not. At the heart of the theory is the proposal that this difference in distribution reflects licensing needs particular to nominals but absent from CPs and PPs. The examples in (32) exemplify this distinction for CPs vs. nominals:

(32) **A CP complement does not need to be case-licensed in complement position.**
a. We are sure [that the world is round].
cf. **We are sure* [*the world's roundness*].
b. my proof [that the world is round]
cf. **my proof* [*the world's roundness*]
c. They assured us [that the world is round].
cf. **They assured us* [*the world's roundness*].
d. It was proved [that the world is round].
cf. **It was proved* [*the world's roundness*].

This contrast follows in standard accounts from the joint action of a Case Filter (or similar restriction) that requires nominals, but not other categories, to be licensed — plus the exclusion of the bracketed complement positions in (32) from the roster of positions in which licensing is possible. In the previous section,

we reviewed the extension of this standard theory that governs the distribution of subjects. Against the background of a lexicalist perspective on clause-types, this extension adds finite T to the roster of heads that can license a nominal in English, but excludes non-finite T. Consequently, in a non-finite clause, a subject nominal that fails to move to a position in which it can be case-licensed by finite T (and is not licensed by a higher element such as *for*) fails the Case Filter, yielding contrasts like those in (33):

(33) **Nominal subjects of an infinitival clause**

a.	Sue considers Mary to have solved the problem.	*R2*
b.	Mary seems to speak French well.	*R1*
c.	*It seems Mary to have solved the problem.	*unacc. V*
d.	*It was believed Mary to speak French well.	*passive V*
e.	*Mary is aware Bill to be the best candidate.	*A*
f.	*Mary's belief it to have been raining	*N*

[(c-f) repeated from (13a-d)]

This standard proposal makes a clear prediction in light of (32). A non-nominal phrase that is acceptable as the subject of a finite clause should be fully acceptable, all things being equal, as the subject of any kind of clause, finite or non-finite, whether R2 movement takes place or not — including all the positions occupied by *Mary* in (33c-f).

This prediction, however, is strikingly false. In English, CP subjects show exactly the same distribution as nominal subjects, as if they needed to be case-licensed when functioning as subjects, despite lacking this need when functioning as complements:

(34) **Clausal subjects of an infinitival clause**

a.	Sue considers [that the world is round] to be a tragedy	*R2*
b.	[That the world is round] seems to be a tragedy.	*R1*
c.	*It seems [that the world is round] to be a tragedy.	*unacc. V*
d.	*It was believed [that the world is round] to be a tragedy.	*passive V*
e.	*Mary is aware [that the world is round] to be a tragedy	*A*
f.	*Mary's belief [that the world is round] to be a tragedy	*N*

By contrast, in a derivationalist approach that attributes clause size distinctions to Exfoliation, the explanation for the distribution of nominal subjects in (33) is not case-theoretic at all. No contrast is predicted between nominal and clausal subjects. On this approach, *all* subjects of all clauses are licensed, since all clauses start their lives as full finite CPs, capable of licensing their subjects. Examples like (33c-f) are excluded not because the embedded subject fails the Case Filter, but because these examples show *illegal infinitivization* — infinitival clauses that could not have been produced by Exfoliation because no probe attracted the embedded subject into the higher VP. Recall that an embedded clause is reduced to an infinitive on this approach only under very specific circumstances: if the specifier of *to*P has been probed by a CP-external head. To block the starred examples in (33), where the subject of the embedded clause is nominal, it is sufficient to propose that no CP-external head has successfully probed the specifier of *to*P in the embedded clause — in particular, no head with the power to move it to the position in which we see that element on the surface. If the region above the embedded clauses in (33) lacks an R2 probe, then the embedded subjects in (33c-f) can only be parsed as occupying a position internal to the embedded clause. This entails that no Exfoliation has taken place. Consequently, the embedded clause should have remained finite. Crucially, exactly the same prediction holds for (34), where the subject of the embedded clause is clausal. Case-licensing of the embedded subject is irrelevant to all these contrasts. The only thing

that matters is whether the embedded subject, be it nominal or clausal, has been extracted from its clause in response to a CP-external probe. If this is not possible in (33c-f) for lack of an R2 probe, it should be equally impossible in (34c-f).

It might be objected that this theory needs something ad hoc: a list of environments that do and do not contain an R2 probe, in order to predict the contrasts in (33) and (34). It is therefore important to note at this point that *every* proposal compatible with the general picture of R1 and R2 constructions sketched in the previous section must distinguish a list of heads that bear an R1 or R2 probe from those that do not. Of course, ultimately one wants this list to follow from more general considerations, but such an achievement should be no more difficult in an Exfoliation approach than in its competitors.

For present purposes, I will assume the following list of probes in the verbal domain of English (*v*P and VP) to be exhaustive:[20]

(35) **Probes that yield movement of an embedded subject in English**

a. **R2 probe — triggering movement to Spec,VP:** present on [a subset of] active instances of V (but not passive or unaccusative verbs, or A or N)

b. **R1 probe — triggering movement to Spec,*v*P:** present on unaccusative *v* or *a* taking a subset of predicates as their complement (usable as an intermediate landing site on the way to a case position in passive and unaccusative configurations if no intervener blocks the movement)

c. **Ā-probe — triggering movement to Spec, *v*P:** present on *v*, *a*, and *n*

This argument for the Exfoliation approach based on the distribution of CP subjects is not watertight, however. In particular, one might question a key premise of the argument of the previous section by proposing that English clausal subjects are actually obligatorily nominal in some fashion — and therefore in need of case-licensing, in contrast to clausal complements. The parallel between (33) and (34) could then be attributed to standard case-theory in a lexicalist approach to finiteness, and would no longer support the Exfoliation approach over the lexicalist case-theoretic alternative.

The puzzle for case theory is not limited to clausal subjects, however. Every type of constituent that can function as a subject in English shows the same paradigm. (By "function as a subject" I mean "fulfill the same EPP requirement that is otherwise fulfilled by a preverbal nominal in English".) Consider, for example, the predicate fronting construction illustrated in (36), where the fronted predicate satisfies this requirement:

(36) **Predicate fronting in a finite clause**
Even more important than linguistics is the fate of the planet.

Predicate fronting in a finite clause reveals exactly the same paradigm as (33) and (34):

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20. Omitted from this list is whatever triggers or licenses rightward displacement of a "heavy" embedded-clause subject (an instance of "Complex NP Shift" noted by Postal (1974, 83 ff.) (and discussed further by Rizzi 1990b, 34 ff.) in examples like the following:

a. Sue proved ___ to be prime [every number on this list].

b. Allen showed ___ to be Martians [those teachers who continually gave him poor grades]. (Postal 1974, 85, ex.(4f))

If rightward movement is not entirely excluded by antisymmetry or some other factor, one possibility is a +EPP probe on *v* that for some reason, possibly prosodic or information-structural, linearizes its goal to the right — the same probe to which one might attribute rightward Heavy Shift of complements. In cases like these, R2 movement forming a specifier of V might feed rightward Heavy Shift triggered by the probe on *v*, or the probe on *v* might find the embedded subject within its clause, triggering Exfoliation itself. The possibility called "Kayne's paradigm" in the next subsection suggests that the second derivation must be at least permitted. I will not discuss Heavy Shift at any length here, reserving discussion for the occasional footnote.

(37) **Predicate fronting in an infinitival clause**

a.	Sue considers [even more important than linguistics] to be the fate of the planet.[21]	*R2*
b.	[Even more important than linguistics] seems to be the fate of the planet.	*R1*
c.	*It seems [even more important than linguistics] to be the fate of the planet.	*unacc. V*
d.	*It was believed [even more important than linguistics] to be the fate of the planet.	*passive V*
e.	*Mary is aware [even more important than linguistics] to be the fate of the planet	*A*
f.	*Mary's belief [even more important than linguistics] to be the fate of the planet	*N*

It is unlikely that one can successfully argue that non-arguments like the fronted predicates in (37) are nominal and therefore in need of case. The Exfoliation alternative, by contrast, straightforwardly explains the data without reference to case or obligatory nominality. I take the relative acceptability of (37a) to indicate that the R2 probe, like T or *to* in (37), is able to attract the fronted predicative phrase in the first place. It is therefore not a φ-probe hunting exclusively for nominals, but a probe with a more general set of requirements. The predicate fronting paradigm in (37) is predicted by the same principles that predict its counterparts with nominal and clausal subjects.

Locative inversion yields an identical paradigm, as do constructions with expletive *there* — with the same considerations favoring an Exfoliation account over a case-theoretic alternative:

(38) **Locative inversion in an infinitival clause**

a.	Sue considers [in this room] to be found the finest examples of Athenian sculpture	*R2*
b.	[In this room] seems to have been found the finest examples of Athenian sculpture.	*R1*
c.	*It seems [in this room] to be found the finest examples of Athenian sculpture	*unacc. V*
d.	*It was believed [in this room] to be found the finest examples of Athenian sculpture	*passive V*
e.	*Mary is aware [in this room] to be found the finest examples of Athenian sculpture	*A*
f.	*Mary's belief [in this room] to be found the finest examples of Athenian sculpture	*N*

(39) **Expletive in an infinitival clause**

a.	Sue considers [there] to be a riot in progress.	*R2*
b.	[There] seems to be a riot in progress.	*R1*
c.	*It seems [there] to be a riot in progress.	*unacc. V*
d.	*It was believed [there] to be a riot in progress.	*passive V*
e.	*Mary is aware [there] to be a riot in progress.	*A*
f.	*Mary's belief [there] to be a riot in progress	*N*

One loose end that should be mentioned at this point concerns the position from which the non-nominal phrases discussed above undergo R2. In a simple finite clause, these expressions satisfy the general English requirement for a "subject", making it natural to suppose that they are attracted by the same probe on T that otherwise attracts a nominal subject. If this probe is a φ-probe, then CPs, predicates, locatives, and expletive *there* must be viewed as bearing one or more φ-features serving as a goal for T. In the R2

21. Some speakers do not fully accept predicate fronting in a R2 infinitival (perhaps because the R2 probe is not fully happy with a predicate as its goal) — but the relevant contrast remains clear. A similar comment holds of (38a) below).

constructions discussed above, this element has moved only as far as the specifier of *to*P in the embedded clause. This in turn suggests that *to* bears the same kind of φ-probe as T. [22]

Though Exfoliation provides a uniform explanation for all the paradigms discussed in this chapter, a lexicalist defender of the standard case-theoretic approach might reply as follows. The constructions in (37)-(39) all include a postverbal nominal. This nominal also needs to be case-licensed. Perhaps it is this postverbal nominal's needs that remain unsatisfied in the starred members of these paradigms. This lexicalist alternative would require distinct explanations for the paradigms in (34) and the paradigms (37)-(39), in contrast to the uniform explanation provided by the Exfoliation alternative. It would also need some account of how the postverbal nominal gets licensed in R2 constructions where it is the fronted predicate, fronted locative, or *there* that undergoes R2 movement, and there is no visible finite T within probing distance of the embedded postverbal nominal that could plausibly license it. On an Exfoliation account, by contrast, the postverbal nominal is licensed pre-Exfoliation, by whatever mechanism licenses this nominal in non-exfoliated, fully finite clauses. I will return to this topic in section 2.6 below, where a similar (but even more revealing) construction in Icelandic is discussed.

Of course, there is no *logical* reason to require a uniform explanation for the various phenomena discussed in this subsection, beyond general considerations of explanatory parsimony. In the next subsection, therefore, we examine another puzzle posed by infinitival subjects for case theory that dissolves under an Exfoliation view — and poses an even more difficult problem for case theoretic accounts of the subject position of infinitives.

2.5.2 *Surprising absence of Case Filter effects on nominal subjects: derivational opacity*

The previous subsection offered an Exfoliation explanation for non-nominals that behave under standard lexicalist theories as if they anomalously require case. This subsection discusses nominals that seem to behave under these same theories as if they anomalously do *not* need case — and argues against an alternative under which case actually is assigned to them in a special fashion. Once again, I will argue that a derivationalist theory of finiteness based on Exfoliation eliminates the puzzle. There will be one wrinkle, concerning clauses whose subject is expletive *it*, for which I will tentatively suggest an explanation that is simple, but does require an additional stipulation.

Consider a configuration in which an active instance of V has been merged with a (full finite) CP, but the subject σ of the embedded clause may not be accessed by an R2 probe on V. On an Exfoliation approach to infinitival clauses, there are two scenarios that might produce such a situation:

(a) the higher clause lacks the R2 probe; or
(b) an intervening nominal blocks contact between the R2 probe and σ for reasons of Minimality.

In an Exfoliation approach, the embedded clause in both scenario (a) and (b) may still become an infinitive if a *non*-R2 probe makes contact with σ and successfully extracts it from the embedded clause. In scenario (a), the extractor could be either an R1 probe or an Ā-probe. In situation (b), the extractor could only be an Ā-probe, since the same Minimality considerations that would block an R2 probe from extracting the embedded subject should also block an R1 probe from doing the same. I show below that these predictions are fulfilled. In the context of a lexicalist approach to finiteness, in which infinitival clauses are born and not made, however, these predictions (especially the one that concerns Ā-movement) look like additional puzzles of case theory.

22. Alternatively, it might be supposed, as often argued, that one or more of these non-nominal subjects is actually attracted by a head distinct from T (and perhaps from *to* as well). The same result would follow, so long as this head may be lower in the structure than T, producing an infinitive when Exfoliation applies.

The predictions of the Exfoliation approach in scenario (a) are instantiated in French, on the following assumption:

(40) **French *believe*-class verbs**
A French verb of the *believe*-class (unlike its English counterparts) does not bear an R2 probe.

The claim in (40) immediately predicts (41a), which would have an acceptable parse if the higher V had an R2 probe. More interestingly, it also predicts the sharp contrast between (41a) and the fully acceptable (41b), in which the embedded subject has moved in response to an Ā-probe on the higher *v*. Likewise (41c), in which an R1 probe on passive *v* triggers longer-distance A-movement of the embedded subject, is also predicted to be acceptable:[23]

(41) **Kayne paradigm with French verbs like 'believe' (= (41)**

a. **R2:**
* Je croyais cet homme être arrivé.
'I believed this man to have arrived.'

b. **Ā-movement:**
l'homme que je croyais ___ être arrivé…
the man that I believed AUX.INF arrived…
'the man that I believed to have arrived…' (cf. Kayne 1981, p. 357, ex. (65))

c. **passive:**
% Marie a longtemps été crue ___ avoir résolu ce problème.
Marie AUX.3SG long.time AUX.PTCP believed AUX.INF solved this problem.
'Mary has for a long time been believed to have solved this problem.'
(Pollock 1985, p. 307, ex. (56))

English also instantiates scenario (a) with verbs such as *wager*, a class whose properties were discovered by Postal (1974, 305 ff.):[24]

(42) **Scenario (a) instantiated by English *wager*-class verbs**

a. * We wagered Mary to be the most likely winner.
b. Mary, who we wagered ___ to be the most likely winner...
c. Mary was wagered ___ to be the most likely winner.

(43) **Other verbs in the *wager*-class**
admit, affirm, announce, assert, avow, claim, conjecture, declare, decree, disclose, grant, guarantee, intimate, maintain, mumble, mutter, note, observe, posit, recollect, said, scream, shout, sight, state, stipulate, verify, whisper, yell, ...

Pesetsky (1991) noted that most of the verbs that behave like *wager* are also obligatorily agentive, and argued that this correlation was systematic. For example, a non-agentive *believe*-class verb coerced into agentivity (by use in an imperative, for example), loses the possibility of R2:

23. Cross-clausal passive as in (41c) is not fully acceptable to all speakers, as discussed by Pollock (1985), and not uniformly available to verbs of the *believe* class.
24. Postal described these verbs as obeying a "Derived Object Constraint", which licenses an infinitival complement so long as its subject does not end up in the R2 position, which for Postal was a direct object position in the higher verbal domain.

(44) **Coercion into the *wager*-class entails loss of R2 probe**
a. Sue ultimately understood Bill to have died only after we had explained it to her many times.
b.??No, you can't talk to Bill. Try to understand him to have died.
(cf. *No, you can't talk to Bill. Try to understand that he has died.*)

On an Exfoliation approach, the stipulation in (45) (for which one obviously would like a deeper explanation), an English counterpart to (40), immediately accounts for the paradigm in (42), just as it accounted for (41):[25]

(45) **Agent-R2 stipulation (English) (***background assumption: derivationalist*)
An obligatorily agentive verb does not bear an R2 probe.[26]

Scenario (b) is exemplified by English double-object verbs such as *assure*, which I will call the *Kayne paradigm* after its discoverer (Kayne 1984a, xiii):

(46) **Scenario (b) exemplified by English double-object verbs (Kayne paradigm)**
a. *I assure you Mary to be the best candidate.
b. Mary, who I assure you ___ to be the best candidate …
c. *Mary was assured you ___ to be the best candidate …

Here, even if we assume *assure* bears an R2 probe (since it is not obligatorily agentive; cf. *the evidence assured us that Mary was the best candidate*), the fact that the main-clause indirect object intervenes between the higher verb and the embedded subject will prevent the R2 probe from finding the embedded subject in the first place, accounting for (46a). The same considerations apply to the R1 probe in (46c). On the other hand, the Ā-probe on *v* should not be blocked by the indirect object from contacting the embedded subject in the specifier of *to*P within the embedded clause — so long as the embedded subject, but not the indirect object, bears relevant Ā-features. The contrast between (46a) and (46b) is thus predicted as well.

Let us now compare these derivationalist, Exfoliation-based explanations with plausible case-theoretic, lexicalist alternatives. If we assume that the infinitival clauses in (41), (42), and (46) are produced as a matter of free lexical choice, and that an infinitival clause fails to furnish a clause-internal case-licenser for its subject, the question posed by the unstarred members of these paradigms is whether the derivation provides a clause-*external* licenser for the embedded subject. Putting aside the passive (c) examples for the moment, let us consider how this approach might explain the contrast between unacceptable R2 in the (a) examples and acceptable Ā-movement of the same element in the minimally contrasting (b) examples.

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25. Rightward Heavy Shift of the embedded subject (see footnote 20) is possible with *wager*-class verbs, as noted by Postal (1974, 305, ex. (42d))

They wagered ___ to be double-agents [all of the Parisians who the CIA had hired in Nice]. (adapted from Postal)

This indicates that whatever probe is responsible for Heavy Shift, it is not the R2 probe itself.

26. Aliaksei Akimenka (personal communication) raises a question concerning the availability of this probe in constructions in which an agentive verb takes one or more DP complements, rather than a clausal complement. Koizumi (1993; 1995) has argued that obligatory raising of the object to the specifier of VP explains why an adverb may follow a first object but not precede it (*Mary handed* (**slowly*) *the book* (*✓slowly*) *to Sue*). It would be natural to view the probe responsible for this raising as the same R2 probe responsible for raising the subject of an embedded clause. But verbs like *hand* are agentive, and thus should lack this feature, given (45). The very verb *wager* presents this issue as well: *We wagered* (**recently*) *five dollars* (*✓recently*) *that the world was round.* Because the actual source of the Agent-R2 stipulation (45) remains mysterious, we are free to restrict it to agentive verbs taking a clause as its sole complement — but Akimenka's observation increases the urgency of figuring out what the actual constraint consists of, and why. I leave this as an open problem.

The natural response on a lexicalist approach is to posit a case-licenser in the higher clause that becomes accessible to the subject of the embedded infinitive only when it moves. Kayne (1981; 1984a, xiii) offered a proposal of just this sort. He proposed that in configurations showing (what I have dubbed) the Kayne paradigm, the embedded infinitival clause presents a barrier to assignment of case from the higher clause to the embedded subject. But if that subject undergoes successive-cyclic Ā-movement through an embedded specifier of CP of the infinitival clause, it is accessible to case-licensing from the higher clause while in that intermediate landing site.

If case-licensing is blocked by a structurally intervening nominal, then this specific proposal will not explain the fact that the *croire* and *wager* paradigms extend to double-object configurations like (46b), since Ā-movement of the embedded subject to the edge of its own clause will not raise it above the higher-clause indirect object. The updating of Kayne's proposal by Rezac (2013, 310 ff.) avoids this problem by positing the specifier position of the main-clause *v*P as the position in which this licensing takes place.

At the center of Kayne's and Rezac's proposals, however, is the presupposition that the embedded subject of an infinitival clause requires a case-licenser in the higher clausal domain in the first place — a claim denied by the Exfoliation alternative, under which the infinitival clause started out full and finite. This claim can be tested. If the embedded subject in the (b) sentences above does indeed rely on a higher-clause case-licenser, then we expect the possibility exemplified in these examples to disappear if the predicate of the higher-clause is replaced with an element that does not otherwise case-license nominals.

In fact, however, when the main-clause predicate is a passive verb, an adjective or a noun, we continue to observe the Kayne paradigm. Ā-extraction of an embedded subject still saves the subject of an embedded infinitival clause:

(47) **Putative case-licensing of subject of infinitival under Ā-movement insensitive to distinctions that matter for licensing complements**
background assumption: lexicalist

a.	Mary, who I've been assured ___ to be the best candidate…	*passive*[27]
b.	Mary, who I am positive ___ to be the best candidate…	*adjective*[28]
	Mary, who we're confident ___ to be the best candidate…	
c.	Mary, who I have a hunch ___ to be the best candidate…	*noun*[29]

Recall now that Kayne's variant according to which the Ā-moved nominal is case-licensed in the embedded specifier of CP in (41b), (42b), and (46b) also runs afoul of Minimality considerations in explaining the double-object example (46b) — in contrast to variants like Rezac's that posit the specifier of the higher-clause *v*P as the licensing position. Suppose now that one attempts to deal with the problem posed by (47) for all versions of this proposal with a claim that the distinction between licenser and non-licenser disappears for some reason when the licensing position has been targeted by Ā-movement. Such a proposal would have to stipulate that this kind of liberal case-licensing is available to an Ā-moved nominal only when it has been extracted from the subject position of an infinitive. Ā-movement of a nominal complement does not save the nominal from case-filter effects, as (48) shows:

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27. Kayne himself observed that passive morphology fails to block the possibility seen in examples like this.

28. Kayne appends a star to *John Smith, who I'm sure __ to be one of the very best students in the class…*, supporting a conclusion opposite from the one advanced here. I suspect that Kayne's example may suffer from a garden-path problem, since *sure* is both a transitive adjective (*I am sure that John Smith is one of the very best students…*) and an unaccusative R1 adjective. A tendency to misparse the subject *I* as the filler of the subject gap in the infinitival clause might be the source of the star reported by Kayne. I have chosen adjectives without this ambiguity for my examples above, and have not found disagreement with the judgment that they are acceptable.

29. I find myself somewhat queasy about this example, but I have not found any objection to it from other speakers.

(48) **Putative case-licensing in Ā-specifier position limited to moved subject of infinitival clause**
background assumption: lexicalist

a. your honesty, which I've been assured *(of)… *passive*
b. Mary, who I am positive *(about)… *adjective*
c. Mary, who I have a hunch *(about)... *noun*

Thus neither Kayne's nor Rezac's proposal appears to be sustainable as an explanation for the Kayne paradigm. I conclude that the solution to the puzzle does not involve the positing of an infinitive-external licensor for the moved subject, but instead involves a classic kind of *derivational opacity*. The subject of the embedded clause is case-licensed in an entirely normal fashion by finite syntactic structure that later disappears as a consequence of Exfoliation triggered by the movement of that subject. The generalization that subjects are licensed by material not overtly present in an infinitive (e.g. tense or agreement) is not surface-true, but is true at an earlier derivational stage. This conclusion thus supports the derivationalist view of finiteness developed here, according to which the embedded clause is constructed by Merge as full and finite. As we have seen, the if certain higher predicates lack an R2 probe, that single claim predicts all the paradigms discussed so far under an Exfoliation analysis of infinitive formation — precisely because its central question is not "Now that Merge has built an infinitival clause, can movement solve the problems that this creates for the subject?", but "Was the infinitival clause legally produced by Exfoliation?"

2.5.3 *A puzzle for the Kayne paradigm*

The claim that only Exfoliation can produce an infinitival clause is crucial to the explanation of the array of contrasts that follow in standard lexicalist accounts from the special case-licensing problems faced by the subject of such a clause. The impossibility of (42a) and (46a) above, for example, follows in the Exfoliation approach from the fact that no probe has made contact with the subject of the embedded clause — not from any difficulty with licensing of the the embedded subject. By limiting itself to situations in which the crucial goal is one phase away from the probe, Exfoliation as stated in (21) also entails that Ā-movement of a non-subject from inside *v*P will not trigger the rule (in contrast to the Kayne paradigm just discussed, in which the subject itself undergoes Ā-movement):

(49) **Non-subject Ā-movement does not motivate Exfoliation**

a. *French, which Mary wagered Sue to speak fluently ___ …
b. *This book, which I assure you Sue to have read ___ …

The *wh*-phrase in the unacceptable (49a-b) originates within *v*P of the embedded clause, from where it can reach the specifier of the highest CP by successive cyclic movement through phase edges, without ever triggering Exfoliation. We return to the actual path that it takes shortly.

There is one pattern, however, for which which the traditional lexicalist case-theoretic approach makes a correct prediction, but which the derivationalist alternative explored here fails to predict on its own.[30] The Kayne paradigm is surprisingly unavailable if the higher-clause contains an R1 predicate such as *seem* or *likely*, or the passive form of transitive verbs like *believe* — and if the subject of that predicate is expletive *it*:

(50) **Kayne-paradigm Ā-extraction impossible with an R1 predicate and expletive *it***

a. *Mary, who it seems ___ to be the best candidate …
b. *Mary, who it is likely ___ to be the best candidate …
c. *Mary, who it was believed ___ to be the best candidate …

30. To the best of my knowledge, these facts, though well-known in their own right (Chomsky, 1980, 28 ex. 77), have not been previously noted as posing a particular problem for the analysis of the Kayne paradigm.

The unacceptability of examples comparable to (50) but without Ā-movement, such as the following, has already been explained.

(51) **Examples comparable to (50) but without Ā-movement**

a. *It seems Mary to have solved the problem. (=(33c), (13a))

b. *It is likely Mary to be the best candidate.

c. *It was believed Mary to be the best candidate.

Since an unaccusative predicate like *seems* lacks an R2 probe, there is no parse for (51a-c) in which the embedded subject has been extracted out of its original clause. Consequently, the infinitival clauses in these examples could not have been produced by Exfoliation in the first place.

As things stand, however, the examples in (50) should not have the same status. All things being equal, the *wh*-phrase in (50) should be able to participate in a derivation in which it raises only as far as the specifier of *to*P in the embedded clause, where it is eventually targeted across the embedded CP boundary by the Ā-probe on *v* in the higher clause. This configuration meets the structural description for Exfoliation.

The unavailability of the Kayne paradigm in these R1 constructions cannot be attributed to any general incompatibility of the paradigm with unaccusativity or passive voice. As examples like (47a) above already showed, when the subject of a passive ditransitive verb is a raised indirect object, rather than expletive *it,* Kayne-paradigm Ā-extraction of the embedded subject is successful. The availability of subject Ā-extraction from the complement of an R1 predicate appears to be sensitive to whether the higher-clause subject is argumental or expletive. The promotion of expletive *it* to subject position that must somehow be incompatible with this pattern of extraction — and that fact is unexpected under the proposal as developed so far.[31]

I propose that the source of the incompatibility is the availability of a successfully competing derivation in which it is *wh*-phrase subject of the embedded clause rather than expletive *it* that raises to the specifier of the higher *v*P — and ultimately forms the subject of the higher clause before undergoing *wh*-movement:

(52) **Alternative to (50a-c)**

a. Mary, who ___ seems ___ to be the best candidate …

b. Mary, who ___ is likely ___ to be the best candidate …

c. Mary, who ___ was believed ___ to be the best candidate …

Recall our discussion in section 2.4.1, of alternations like those in (53)-(54) below:

---

31. It might be possible to demonstrate the same with an unaccusative ditransitive. If it is indeed a general fact that an unaccusative predicate may not be passivized, as first argued by Perlmutter and Postal (1984), the unavailability of passivization for a verb of saying whose subject refers to an inanimate message source (e.g. a book chapter) might indicate that the surface subject is a raised locative rather than an external argument:

(i) **Unaccusative use of communication verbs**

a. Mary claims that language is innate.

b. It is claimed by Mary that language is innate.

c. Chapter 3 claims that language is innate.

d.* It is claimed by chapter 3 that language is innate.

The Kayne paradigm is available with the active version of this type of construction, which might thus be an unaccusative counterpart of examples like (47a):

(ii) **Kayne paradigm with (arguably) unaccusative communication verb**

Language, which chapter 3 claims ___ to be innate …

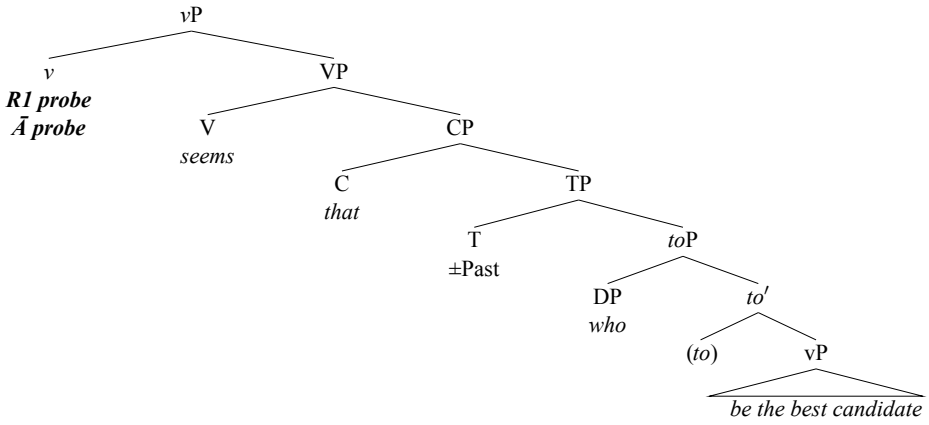
(53) **R2 alternates with full finite CP (= (25))**
   a. Sue believes Mary to have solved the problem.
   b. Sue believes that Mary has solved the problem.

(54) **R1 alternates with full finite CP (= (26))**
   a. Mary seems to have solved the problem.
   b. It seems that Mary to have solved the problem.

One of the two accounts considered in that discussion proposed that both the complement CP and its subject are possible goals for the R2 probe on a higher V or the R1 probe on a higher *v*, and that free choice among these options is responsible for the alternation. The choice is free because the domination relation between CP and its subject prevents either phrase from counting as an intervener for the other. In addition, I suggested that variants with expletive *it* like (54b) reflect the choice of the CP as a whole as the goal for the R1 probe on *v* — with the merger of *it* satisfying the probe's EPP property.

Note now that both the R1 probe and the Ā-probe relevant to *wh*-movement are located on *v*. With this in mind, consider the choices available to the R1 probe on *v* in a potential Kayne-paradigm situation in which a *wh*-phrase has formed the specifier of *to*P in the embedded clause (and has not raised further to T):

(55) **Potential Kayne-paradigm situation**



All things being equal, the R1 probe on *v* should have two choices for the goal that satisfies its EPP requirements: (1) the entire embedded CP, or (2) *who*, which forms the specifier of the embedded *to*P. Crucially, however, choice (2) is also the (only possible) goal for the Ā-probe that is also located on *v.* A natural Economy condition in such situations is the following:[32]

(56) **Economy condition on multiple probe satisfaction**
When two probes can satisfy their requirements with a single operation (in (55), movement of *who*), this option blocks any alternative derivation in which the same pair of requirements are satisfied with two distinct operations (in (55), movement of *who* and merge of *it*).

This Economy condition in effect blocks each example in (50) because of the availability of the corresponding example in (52). In each case, the ability to satisfy both probes on *v* by the raising of *who* pre-

32. Exactly this logic was pursued by Pesetsky and Torrego (2001) in their account of the complementizer-trace effect, though their account cannot be cited as independent support for the present proposal, in view of the very different analysis of this effect offered below. Ideas of a similar sort have been advanced under the rubric of "multitasking" (Rackowski and Richards 2005; Kotek 2014b; Van Urk and Richards 2015; among others), though it remains to be seen whether there is a consistent logic to these proposals that works across the various cases in which it has been applied. I leave this (ultimately crucial) task for later research.

empts the separate satisfaction of the R1 probe by *it*-CP doubling and of the Ā probe by the raising of *who*. Condition (56) does not, however, prevent expletive *it* from cooccurring with Ā-movement from lower positions in the clause, as in (57) below, since the only possible clause-internal goal for the R1 probe on *v* is *Mary*, which is not a possible goal for the Ā-probe on *v:*

(57) **Ā-movement not generally incompatible with expletive *it***
this problem, which it seems that Mary has solved …

Likewise, the Economy condition does not block (47a), where the main-clause indirect object is a closer goal for the R1 probe on *v* than the embedded subject. Once again, this is not a situation in which the requirements of both probes on *v* may be satisfied by a single goal.

Finally, before leaving the Kayne paradigm, it is worth reflecting on how remarkable and challenging the paradigm is in its own right — whether or not the account of the Kayne paradigm presented here proves correct. Note first that all the constructions discussed in this subsection represent a rather learned register — not normal conversational English. Nonetheless speakers have stable intuitions that a particular set of predicates disallows normal R2, but does permit an infinitival complement so long as:

- the matrix predicate is a passive or unaccusative verb, an unaccusative adjective, or noun, and the embedded subject undergoes R1 movement; or
- the embedded subject undergoes Ā-movement and the embedded clause is not doubled by expletive *it* in the subject position of the higher clause.

The contrast discussed in this subsection and summarized in the second bullet above, is especially remarkable. The judgments are clear and stable, but they concern an strikingly obscure set of circumstances in a paradigm that is already confined to a special register of English. Whatever accounts for the comings and goings of Ā-extraction in the Kayne paradigm should almost certainly be rooted in principles of far greater generality than the descriptive statements above. The logic of this point is not new, of course, and mirrors Chomsky's well-known remarks concerning the parasitic gap construction:

> "A descriptive statement ... does not resolve the problem of parasitic gaps; rather, it poses the problem. The problem is to explain why the phenomenon exists with the properties it has. For the reasons discussed earlier, the answer is very likely to be that the phenomenon exists with the properties it has because of other properties of UG and the particular grammar that are quite independent of parasitic gaps; again, it is most unlikely that particular grammars have rules governing parasitic gaps or that UG includes specific principles bearing on this phenomenon, which is a particularly interesting one for just this reason. While this seems a very plausible assumption, it amounts to quite a strong claim, as noted earlier. It means, for example, that all of the quite intricate properties of parasitic gaps must be reducible to general principles of UG, given rules and structures of the particular grammar that are established on other grounds; it means as well that if languages appear to differ with respect to the existence or properties of parasitic gaps, these differences must be completely explained on the basis of other structural differences among the languages in question. The task for the linguist, then, is to show how independent principles of UG and independent properties of a particular grammar interact to yield the distribution and interpretation of parasitic gaps." (Chomsky 1982, 75)

Though the Kayne paradigm has not received the attention accorded to parasitic gaps, I believe it poses the same exciting and instructive challenge to the theory of syntax , for reasons identical to those enumerated by Chomsky in this passage. If the discussion here is correct, the Kayne paradigm as a whole follows

from the very nature of the process that creates infinitival clauses in the first place; and the remarkable observation in the second bullet above might follow from a general Economy condition on probe-goal interaction.

2.6 Unraised nominatives in Icelandic: another derivational opacity argument

In section 2.5.1, several English constructions were discussed in which the DP that would otherwise be the subject of the sentence occupies a post-verbal position, and some other element appears to satisfy the EPP requirement for a preverbal subject. The constructions in question included predicate fronting, locative inversion and clauses with expletive *there*). The point of interest in that section was the fact that when these constructions are found embedded as infinitives, the preverbal phrase behaves, from a standard lexicalist perspective, as if it anomalously requires case — and the observation that no such anomaly arises in the Exfoliation theory. In the concluding paragraph of that section, however, we made an additional important observation: that the Exfoliation approach also correctly predicts that the post-verbal nominal runs into no special licensing problem in an R2 clause. It is licensed before Exfoliation by whatever licenses it in finite clauses that never undergo Exfoliation, and therefore remain finite).

Very similar observations can be made about an infamous puzzle in Icelandic syntax noted by Yip et al. (1987, 240-242) and further discussed by Marantz (1991) and others. As is well-known, Icelandic permits a subject to bear a so-called "quirky" case when required as a lexical property of the verb. A non-quirky third-person complement of such a verb bears nominative morphology and governs number agreement on the finite verb, as (58) exemplifies.

(58) **Quirky subject, nominative object in finite clause (Icelandic)**

a. Barninu batnaði veikin.
the.child.DAT recovered.from.**3SG** the.disease.**NOM.SG**
'The child recovered from the disease.' (Andrews 1982, 462)

b. Barninu bötnuðu veikirnar.
the.child.DAT recovered.from.**3PL** the.disease.**NOM.PL**
'The child recovered from the diseases.'

A point of particular interest has been the fact that the same case pattern is found in R2 constructions, where the embedded clause is infinitival, as (59) shows. The possibility of the parenthesized matrix adverbial following the raised subject makes it clear that this is indeed an R2 construction:

(59) **Quirky subject, nominative object in an R2 infinitival complement(Icelandic)**

Læknirinn$_i$ telur barninu (í barnaskap sínum$_i$) hafa batnað veikin.
the.doctor.NOM believes the.child.DAT (in foolishness his) have.INF recovered.from the.disease.**NOM**
'The doctor$_i$ believes the child (in his$_i$ foolishness) to have recovered from the disease.'

The embedded NOM object in (59) is particularly unexpected under standard lexicalist theories of case and nominal licensing that accept the following statements as tenets:

(a) A nominal must be case-licensed through agreement with an appropriate head, and nominative case is the result of agreement with finite T.

(b) Non-finite clauses are born non-finite.

In examples like (59), as Marantz (1991, 18-19) notes, "if tensed inflection with agreement is the source of NOM case on the objects of DAT subject verbs, we would expect the object to lose its NOM case in an infinitive, because infinitive inflection does not assign NOM. Instead [...], such DAT subject/NOM object verbs still take a NOM object in infinitival constructions although there is no element around to assign NOM case." The only finite instance of T is located in the main clause, separated from the embedded NOM argument by an intervening DAT, and assigns its NOM (in standard theories) to the main-clause subject.

One of the two propositions (a) or (b) must therefore be false. Marantz argued that it is (a) that must be jettisoned, and that case is irrelevant to nominal licensing.[33] If proposition (b) is false, however, as has been argued here, we need not take phenomena like (59) to even bear on the question of whether (a) is correct. Just as in the case of the English constructions discussed in 2.5.1, we are free to propose that the object of the embedded verb in (59) is licensed and bears NOM morphology as a consequence of pre-Exfoliation agreement with the φ-probe on the finite T of its clause.

Of course, as a matter of logic, the Exfoliation approach does not by itself provide independent support for such a proposal. It merely removes examples like (59) as an obstacle to to it. We might accept the arguments for Exfoliation but still have other reasons to propose that an Icelandic object bears NOM morphology not because it is targeted by a φ-probe on T, but because it is the highest nominal in its clause in need of case morphology — as in the "Case in Tiers" proposal of Yip et al. (1987) and the "Dependent Case" model of Marantz (1991). On this view, NOM might be a trigger rather than a consequence of agreement with T in languages like Icelandic, just as argued by Bobaljik (2008). But even so, one could still argue, in view of patterns like (32) and much other work (for example, Levin 2015), that nominals do require special licensing, as I have been assuming throughout.

Whatever the correct view of the relation between NOM and agreement might be, the Exfoliation approach entails that there is a derivational stage at which agreement obtains between T and NOM even in an in infinitival clause like the embedded clause of (59).[34] Is there independent evidence for such a stage? If some other phenomenon can be successfully argued to correlate specifically with agreement (rather

33. In place of traditional ideas about the relation between case-licensing and the distribution of nominals, Marantz advocates an account of R1 that is EPP-based — with a preference for movement over external Merge accounting for the obligatory movement of the subject of an infinitive in English seen in (33). The distinction between nominals and non-nominals in other positions (such as the patterns in (32)) is left without an explanation on this view.

34. Nicholas Longenbaugh (personal communication) points out that this conclusion raises a problem concerning the order of operations. It has been widely argued in the literature that a DAT subject in Icelandic blocks person agreement (and, for some but not all speakers, number agreement as well) between T and NOM in a DAT-subject construction — unless the DAT argument undergoes A-movement to a position where it no longer structurally intervenes between T and NOM (Sigurðsson and Holmberg 2008 and references cited there). When a DAT subject is attracted into a higher VP by an R2 probe, movement of just this sort takes place, so it might seem that all is well. The ordering problem arises, however, if Exfoliation derivationally precedes the raising of the DAT argument. After Exfoliation, the T of the embedded clause, which might have agreed with the embedded NOM argument, is no longer present. If the arguments in the following subsections are correct, T does agree with NOM before Exfoliation removes the TP layer. There are two families of solutions. First, we might permit agreement to take note of the movement of the intervening DAT into the higher VP *before* Exfoliation, either by specifying the following ordering or by viewing all three processes as simultaneous. Exfoliation on this view is not so much a precondition for movement from a non-edge position as a rescue strategy when such movement happens:

1. move embedded subject into the higher VP
2. mark T-NOM agreement in the lower clause as a non-violation of minimality
3. Exfoliation applies

Alternatively, we might permit T to find NOM as its goal across an intervening DAT, but mark the violation of minimality on T itself — so that when T is eliminated as a by-product of Exfoliation, the violation disappears as well. I leave the issue of the correct solution open.

than with NOM case, independent of agreement), and if that phenomenon is detected in infinitival clauses like the embedded clause of (59), it would provide a new independent derivational opacity argument for an Exfoliation analysis of such clauses. Below, I discuss two Icelandic phenomena with exactly these properties.

2.6.1 *Anaphor Agreement Effect in Icelandic infinitives*

The first phenomenon of relevance is the common incompatibility of reflexive anaphors with agreement, which Rizzi (1990a) dubbed the *Anaphor-Agreement Effect* (**AAE**), exemplified in (60) for English and Icelandic:

(60) **Anaphor-Agreement Effect**

a. *Mary believes that herself gave a good talk.

b. *Jón segir að sig elski Maríu. (Icelandic)
John says that REFL love.SBJV.3SG Mary

The phenomenon seen in (60) is widespread across unrelated and geographically diverse languages, suggesting that its roots run deep — and in particular, that we are not dealing with an idiosyncratic paradigm gap. Evidence that it is *agreement* that is cross-linguistically toxic to reflexives, and not NOM case (or subjecthood), comes from multiple sources — in particular, two important predictions noted by Woolford (1999, 258). First, the AAE hypothesis predicts, apparently correctly, that a NOM-marked reflexive anaphor should be acceptable in a language without subject agreement (as long as its antecedent is sufficiently local). It also predicts, again apparently correctly, that any syntactic position that is agreed with, even a non-subject, should block the appearance of a reflexive in that position. Further indirect evidence for the cross-linguistic reality of the AAE is the fact that languages often seem to go out of their way to provide an expression of reflexivity that does not run afoul of the AAE. These strategies may be particular to AAE-inducing positions, permitting the suppression of otherwise obligatory φ-agreement (marginally possible in Italian; Sundaresan (2016, 79 ex. 3)) or the replacement of normal object φ-agreement morphology with an invariant marker (as in Swahili, discussed by Woolford). Alternatively, the special strategy may involve the reflexive itself, which may be lexically designated as a bearer of an oblique case that side-steps agreement (as in the Inuit languages studied by Bok-Bennema 1991 and discussed in an AAE context by Woolford and by Yuan 2017a), or which may be embedded in a larger nominal that can be the target of agreement without running afoul of the AAE. [35]

Since long-distance binding of a reflexive across a subjunctive clause boundary is generally permitted in Icelandic, it is no surprise that when a reflexive in such a clause bears quirky case and therefore fails to trigger φ-agreement, it is acceptable as a subject:

(61) **No AAE effect for quirky subject (Icelandic)**

Hún sagði að sér þætti vænt um mig.
she said that REFL.**DAT** was.SBJV.3SG fond of me
'She$_i$ said that she$_i$ was fond of me.' (Maling 1984, 216 ex. (8b); Woolford 1999, 261 ex. (9a))

It is likewise no surprise that a NOM object, which *is* a target for agreement by finite T, may not be a reflexive in a finite clause . This is, in essence, just an Icelandic example of the AAE affecting direct objects:

35. See Sundaresan (2016) for a recent discussion of many such strategies. I owe my own understanding of these possibilities to the preliminary sections of Yuan (2017a).

(62) **AAE effect for NOM object (Icelandic)**
*Maríu leiðist sig.
Maria.DAT find.boring.3SG REFL.**NOM**
Intended: 'Maria finds herself boring.'
(Everaert 1991, 289, ex 27; cf. Woolford 1999, 261 ex 8b)

Surprising from an AAE perspective, however, is the fact that a reflexive is also excluded as the NOM object in an *infinitival* R2 clause like (59), where there is no visible agreement morphology whatsoever in the embedded clause, as illustrated in (62):

(63) **AAE effect for NOM object (Icelandic)**
*Ég tel Maríu leiðast sig.
I believe Maria.DAT find.boring.INF REFL.**NOM**
Intended: 'I consider Maria to find herself boring.'
(Heimar Viðarsson and Halldor Sigurðsson, personal communication; building on Everaert 1991)

The unacceptability of the reflexive in (63) cannot be attributed to a failure of c-command by the DAT antecendent, since a DAT nominal may serve as the antecedent for a *non*-NOM reflexive, as noted by Zaenen et al. (1985, 456 ex 31) and Taraldsen (1996, 200 ex 28), among others. If we adopt a lexicalist approach to infinitival clauses, and if it is truly agreement that blocks the reflexive anaphor in examples like (60) and (63), we do not expect (61) to contrast with (63), since in both constructions the reflexive has a local antecedent and in neither construction is there visible agreement between the verb and the reflexive.

From the derivationalist perspective developed here, however, this contrast is expected. Before Exfoliation, the embedded clause in (63) was fully finite, and as such showed agreement between the embedded T and the NOM object. If the AAE is a correct generalization (and if no other factor explains the unacceptability of the reflexive in examples like (63)), this observation constitutes independent evidence for a derivational stage in which infinitival clauses are full and finite. It also constitutes a striking example of *opaque interaction* in syntax, since all signs of the agreement that otherwise correlates with the impossibility of a reflexive have been obliterated by Exfoliation.

At least one significant problem remains, however. The impossibility of an embedded NOM object reflexive in an R2 construction like (63) contrasts with the complete acceptability of a reflexive as the raised ACC subject in an R2 construction — despite the fact that here too the reflexive occupied a position targeted by agreement before Exfoliation took place:

(64) **No AAE effect for raised ACC subject in R2**
a. She believes herself to be strong.
b. Hún telur sig vera sterka. (Icelandic)
She.NOM believes REFL.ACC be.INF strong.F.ACC

What accounts for this contrast? One obvious difference between the raised subject in (64) and its unraised counterpart in examples like (63) is the fact that the embedded subject in (64) has received a new case (ACC) after moving into the higher VP, while nothing comparable takes place in examples like (63). I suggest that this fact holds the key to the contrast.

One sign that case, rather than raising per se, is responsible for the contrast comes from R2 constructions in which a new case is not assigned after movement of the embedded subject. Icelandic differs from English in permitting an R2 probe on an unaccusative V with DAT-subject verbs like 'seem' and 'appear' — as in (65), where the availability of the parenthesized higher-VP subject-oriented parenthetical to the

right of the raised subject argues for R2 movement. Famously, the case of the raised subject is NOM, as predicted in multiple ways by the various proposals mentioned above — since it is not locally commanded by a distinct non-oblique nominal either before or after raising into the matrix VP, and enters an agree relation with the embedded T before Exfoliation, and with the matrix T after raising:

(65) **"Nominative with infinitive" construction (Icelandic)**
Mér sýndist Haraldur (í barnaskap mínum) hafa gert þetta vel.
me.DAT seemed Harold.NOM (in foolishness my) have.INF done this well
'Harold seemed to me (in my foolishness) to have done this well.'
(Thraínsson 1979, 426, ex 121)

Crucially, the raised NOM subject in this construction may not be a reflexive:

(66) **AAE effect in "Nominative with infinitive" construction (Icelandic)**
*Mér sýndist sig hafa gert þetta vel.
me.DAT seemed REFL.NOM have.INF done this well
'I seemed to myself to have done this well.'

This problem can be resolved if we view Icelandic case and nominal licensing as sharing key properties with case and licensing in Sakha, as analyzed by Baker and Vinokurova (2010, esp. 639) — and add to the picture a novel view of the source of the AAE: that it is a Case Filter effect. Baker and Vinokurova argued at length, on grounds unrelated to the present discussion, that nominal licensing in Sakha takes place in one of two ways: either (1) by agreement with an element such as T, or (2) by the assignment of dependent case (under local c-command by a distinct non-oblique nominal). The novelty in their proposal was two-fold. First, the integration of dependent case into a view that also countenances agreement as a source of case; and second, the idea that dependent case has a licensing role and is not purely morphological (a view independently supported by Branan 2017 on Kikuyu). If Icelandic has essentially the same system as Sakha (and the clause is a locality domain for dependent case), then licensing by agreement with T should be the only strategy available for the subject of a finite clause, or for a direct object locally c-commanded only by an oblique nominal within that clause.[36]

Now let us introduce the novel view of AAE to be advanced here. I propose that positions targeted by agreement are not intrinsically toxic to a reflexive, as in standard views of the AAE, but merely fail to case-license the reflexive:

(67) **AAE revised**
Agreement does not case-license a reflexive anaphor.

It follows from (67) that a reflexive that remains in a position where agreement with T is the only possible source of licensing will violate the Case Filter. But if the reflexive moves to a case-licensing position not subject to (67), no violation will ensure. I suggest that this is what saves the reflexives in (64), assuming a Baker-Vinokurova theory of case assignment.

If this proposal is correct, an obvious question concerns the reasons why (67) should hold. One possibility is that a reflexive is simply not an appropriate agreement target in the first place for a probe on T — either because of some intrinsically anti-reflexive property of agreement (as suggested by Picallo 1985 and

36. An oblique nominal like the dative subject in (61) may be presumed to be licensed by a null P — another form of licensing (cf. Levin (2015)). Note that in the Exfoliation theory, this does not prevent such obliques from undergoing Raising, since no Activity Condition is assumed.

Rizzi 1990a) or perhaps because reflexives are deficient in some φ-feature, as has often been suggested, crucial to successful agreement.[37] I will leave this matter for future research.

2.6.2 *Syncretism-related amelioration of a person restriction in Icelandic infinitives*

We now turn to the second agreement-related phenomenon that might provide additional evidence for a derivational stage in which the verb of an R2 infinitive is finite and shows agreement with a NOM argument.

As is well-known, [+Participant] (first-person and second-person) NOM objects are problematic in finite clauses with overt agreement, for most speakers. Example (68) demonstrates this effect for clauses with present and past-tense indicative verbs.[38]

(68) **NOM objects in present- and past-tense indicative clauses (Icelandic)**

	Present			**Past**			
a.	(?)	Henni	leiðist	ég.	g. (?)	Henni	leiddist	ég.
		her.DAT	find.boring.PRS.1SG	I.NOM		her.DAT	find.boring.PST.1SG	I.NOM
		Intended: 'She finds me boring.'				Intended: 'She found me boring.'		
b.	(?)	Henni	leiðist	þú.	h.	(?)	Henni	leiddist	þú.
		her.DAT	find.boring.PRS.2SG	you.NOMSG			her.DAT	find.boring.PST.2SG	you.NOMSG
		Intended: 'She finds you (sg.) boring.'					Intended: 'She found you (sg.) boring.'		
c.	✓	Henni	leiðist	hann.	i.	✓	Henni	leiddist	hann.
		her.DAT	find.boring.PRS.3SG	he.NOMSG			her.DAT	find.boring.PST.3SG	he.NOMSG
		'She finds him boring.'					'She found him boring.'		
d.	*	Henni	leiðumst	við.	j.	*	Henni	leiddumst	við.
		her.DAT	find.boring.PRS.1PL	we.NOM			her.DAT	find.boring.PST.1PL	we.NOM
		Intended: 'She finds us boring.'					Intended: 'She found us boring.'		
e.	?	Henni	leiðist	þið.	k.	?*	Henni	leiddust	þið.
		her.DAT	find.boring.PRS.2PL	you.NOM.PL			her.DAT	find.boring.PST.2PL	you.NOM.PL
		Intended: 'She finds you (pl.) boring.'					Intended: 'She found you (pl.) boring.'		
f.	✓	Henni	leiðast	þeir.	l.	✓	Henni	leiddust	þeir.
		her.DAT	find.boring.PRS.3PL	they.NOM			her.DAT	find.boring.PST.3PL	they.NOM
		'She finds them boring.'					'She found them boring.'		

Most accounts of the contrast between [+Participant] and third-person NOM attribute the effect to some failure connected to agreement with [+Participant] NOM objects. In one family of accounts, the DAT argument is a structural intervener that blocks person agreement between T and the NOM object — which in turn runs afoul of a licensing requirement on [+Participant] nominals that requires such agreement (Anagnostopoulou 2003, 272-274; Béjar and Rezac 2003, 56ff.). Third-person nominals lack person features entirely, and are thus immune to the agreement requirement. One sign of the relevance of agreement to these

37. If this is correct, a question arises about some of the strategies mentioned above as "end runs" around the AAE in some languages. In particular, the suppression of otherwise obligatory φ-agreement marginally possible in Italian and the replacement of normal object φ-agreement morphology with an invariant marker found in Swahili could be viewed as instances of special case-licensers available for reflexives.

38. For the comparative judgments given here, I am very grateful to Höskuldur Thráinsson (reporting judgments of two others as well) and to Halldór Ármann Sigurðsson, p.c. The overall strength of their judgments of deviance differed somewhat, but I believe the pattern presented here represents their data fairly. It is unfortunately important to emphasize the uncertainty with which these judgments were given, and the variation that seems to exist among Icelandic speakers. I am also grateful, for example, to Iris Edda Nowenstein, a younger generation speaker, who permits 3PL agreement in the (d) and (j) examples of (68) and dislikes the (c) and (f) examples of (69) below at a level comparable to the others in that paradigm.

contrasts is the fact that the contrast disappears for speakers who have replaced NOM objects in their speech with ACC objects, which do not trigger verbal agreement (and is not found in closely related Faroese, where ACC is often the norm).

It is therefore significant that a similar effect (for some speakers) surfaces even in *infinitival* R2 clauses, as first noted by Sigurðsson (2004, 155 note 14) and discussed in more detail by Schütze (2003):

(69) **1PL and 2PL NOM objects in an R2 infinitive (Icelandic)**
Ég tel henni leiðast…
I believe her.DAT find.boring.INF…
'I consider her to find boring…'

a.	?* …ég. …I.NOM.SG	d.	* …við. …we.NOM
b.	?* …þú. …you.NOM.SG	e.	?* …þið. …you.NOM.PL
c.	✓ …hann. …he.NOM	f.	✓ …þeir. …boys.they.NOM

If the contrast between third-person and [+Participant] subjects in (68) is due to an agreement problem, then we must conclude that the same kind of agreement is present in the infinitival embedded clauses of (69), precisely as predicted by an Exfoliation account.

The point might be taken even further. There might be evidence that the actual *exponents of finite agreement* are in derivational play before Exfoliation. Let us now pay attention to the fact (ignored so far) that the judgments listed for the deviant, non-third-person examples in (68) are not equally strong. The worst example in every paradigm is the 1PL form; the second worst example is the 2PLform; and the singular [+Participant] forms are judged deviant, but not quite as bad. Schütze (2003) attributes to Sigurðsson the important observation that these shaded judgments correlate with the degree of syncretism of the relevant [+Participant] verbal morphology with the unmarked3SG form of the verb (which one may view as a non-agreeing form). Quoting Schütze's summary of the generalization (adapted to the two paradigms listed above):

> "[In a] detailed survey of agreement judgments, [...] Sigurðsson (1990-1991, 1996) observed the following descriptive generalization: 'Many speakers seem to accept [1st- and 2nd-person] nominative objects in so far as they can be interpreted such that they both do and do not control agreement.' Thus, [(68a/g) and (68b/h)] are essentially fine because all three singular forms of this verb [in both tenses] are syncretic; [(68d/j)] is completely out because the 1PL form sounds nothing like the 3SG form; [(68k)] is marginally possible, according to Sigurðsson, because the 2PL verb form sounds very similar to the 3SG form." — and [(68e)] is even better because the 2PL past tense form is fully syncretic with 3SG. (Schütze 2003, 299)

Schütze offers a proposal to explain this generalization, according to which a φ-probe on T that finds and agrees (or attempts to agree) with the DAT argument in constructions like these may probe further and agree for a second time with the lower NOM argument (with some degree of marginality) — so long as the morphological consequence for the verb of finding the DAT argument (i.e. 3SG, the unmarked form) and the morphological result of agreement with the [+Participant] argument sound the same or very similar. Sigurðsson's generalization and Schütze's proposal thus groups this phenomenon with other cases of feature conflict resolution ameliorated by syncretism, such as those discussed by Pullum and Zwicky (1986) and Citko (2005, 486-488), among others. Asarina (2011, 188 ff.) attributes the phenomenon to the

possibility of a single node bearing a split feature-structure as a consequence of multiple case assignment or agreement. This result is acceptable so long as the condition in (70) is obeyed:

(70) **Spellout of multiple feature structures** (Asarina 2011, 191)
All feature structures on a single item must be spelled out by a single insertion rule.

If these proposals concerning (68) are on the right track, than the recapitulation of the paradigm in (69) argues not only that an R2 infinitive spends some derivational time as a full finite clause, but also that provisional lexical insertion takes place during the finite phase of the derivation (updated after Exfoliation), so that syncretisms and non-syncretisms that disappear after Exfoliation nonetheless interact with (70) in a manner detectable in speaker judgments.

This result is potentially, in my view, a particularly strong argument for the Exfoliation approach, if correctly analyzed — and an interesting example of the kind of derivational opacity predicted by the approach. The main grounds for caution appear to be empirical, given the (presently unknown) degree of variation and uncertainty that surrounds some of the important contrasts. For that reason, I will leave for future research the possibility of a less cautious presentation of the findings of this subsection.

We conclude this chapter with one troubling issue that I will not pretend to fully solve. As Shrayana Haldar (personal communication) has pointed out, the fact that the ability or inability to realize a pre-Exfoliation verb form affects speaker judgments contrasts with the inability of pre-Exfoliation EPP violations to affect speaker judgments, as discussed in section 2.4.4. Recall from that section's discussion, however, that it is an independently observable fact that an unsatisfied EPP feature is only toxic if it remains to the end of the derivation. The phenomenon discussed in this section, by contrast, involves a failure of *process*: failure to find a pronounceable form. It is plausible, though perhaps not inevitable, that this is the reason for the contrast in effect.

Speaking only partly in metaphor, we might characterize the origins of perceptions of deviance as follows. Every unsatisfied featural need is a source of linguistic pain, as is every failure to find an exponent when lexical insertion takes place. Pain at any point in the derivation is remembered for the rest of the derivation, all things being equal, and perceived as a judgment of deviance by a language user. The memory of an unsatisfied featural need, however, is erased when the bearer of that feature is eliminated from the derivation — one situation in which all things are not equal. The memory of a failed attempt at lexical insertion, however, is not failure of a featural need, and thus does not get erased if the element that caused the failure is eliminated.

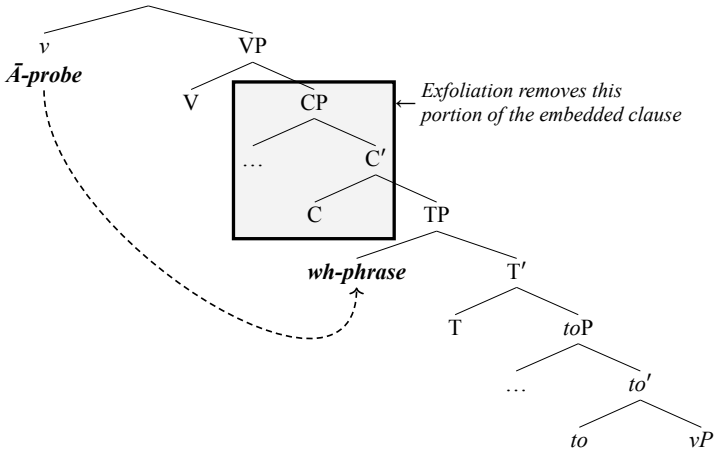
Chapter 3

Exfoliation of CP alone

3.1 Complementizer-trace effects

The discussion so far has focused on derivations in which the subject of an embedded CP raises only as far as the specifier of *to*P, yielding infinitivization when it is the goal of one or another clause-external probe. But the subject of an embedded clause may also satisfy the EPP property of T by raising to the specifier of TP, of course, where it may be targeted by the very same higher probes. Such a scenario should also trigger Exfoliation, but should not yield an infinitive. Clausal layers higher than TP should disappear, but the finite TP layer will remain. Consider, for example, the predicted effect of an Ā-probe on *v* that finds a *wh*-phrase in the specifier of TP of a complement clause. This *wh*-phrase should be able to move into the higher *v*P, so long as the CP layer of the embedded clause is exfoliated away:

(71) **Exfoliation of only CP layer**



The Antilocality constraint (31), repeated below, entails that there is no way for the *wh*-phrase specifier of TP in (71) to escape from the embedded clause except by skipping the specifier of CP, triggering Exfoliation, as shown. There is no "plan B".

(72) **Antilocality constraint** (=31)
Movement to the edge of CP must cross a phase boundary.

Consequently Ā-extraction of the subject from a clause that remains finite should be incompatible with the appearance of an overt complementizer. This prediction is correct and well-known as the *complementizer-trace effect* first explored by Perlmutter (1968, 1971) and studied by many others since.[39] The comple-

39. Fillmore (1963, 220-221, esp. ex 32) appears to be the first discoverer of the effect that Perlmutter rediscovered a few years later. See Pesetsky (2017) for a survey of the many accounts that have been offered.

mentizer *that* is obligatorily absent when the subject of a finite clause is extracted by Ā-movement, with no comparable requirement when a *v*P-internal element such as the direct object is extracted:[40]

(73) **Complementizer-trace effect**
a. Who do you think (that) Sue met ___ .
b. Who do you think (*that) ___ met Sue.

None of the elements of this explanation for the complementizer-trace effect are specific to it — perhaps uniquely among the various explanations that have been advanced for the effect. Exfoliation has been extensively argued for in the previous chapter, and the Antilocality constraint was a crucial component of the explanation of the Kayne paradigm. The account is also robust enough to correctly predict complementizer-trace effects with Ā-movement of non-nominal phrases that satisfy or obviate the EPP requirement of T, in the Locative Inversion and Predicate Fronting constructions discussed in section 2.5.1:

(74) ***That*-trace-Effect with Locative Inversion and Predicate Fronting**
a. How much more important than linguistics did she say (*that) ___ was the fate of the planet.
b. In which room did she say (*that) ___ were found the finest examples of Athenian sculpture.

There are some missing pieces, however. One concerns the optional absence of *that* when a non-subject is extracted, an instance of the more general optionality of overt *that* in complement clauses in English. We will offer an Exfoliation explanation for this in section 3.4. Another problem is the fact that Antilocality blocks short-distance movement to the specifier of CP in constructions such as *Who read the book?* — a topic that we will take up shortly.

A third problem concerns Antilocality itself. As we have seen, it correctly predicts a complementizer-trace effect for a variety of elements Ā-moved from the region between *v*P and CP, including locatives and predicate phrases in inversion constructions, as well as canonical subjects. On the other hand, the constraint wrongly predicts that a *v*P-external adjunct should also show a *that*-trace effect. As Huang (1982, 575) and Lasnik and Saito (1984, 255 ff.) observed, this is not the case. Extraction of *why* from an embedded clause is acceptable even across an overt *that*. In example (75b), the fact that the reason variable bound by *why* outscopes negation in the embedded clause makes it clear that *why* originates in a position outside the embedded *v*P. Movement of this adjunct should thus have been subject to Antilocality, yielding a complementizer-trace effect. Example (75c) makes the same point for a different adjunct, showing that the problem is not a peculiarity of *why*:

(75) **No *that*-trace Effect with extraction of adjunct from a *v*P external position**
a. Why do you think [(that) he left early ___]? (Lasnik and Saito 1984, 255 ex. 80)
b. Why did the reporter say [(that) Mary won't vote for the bill ___]?
c. According to which meteorologist did Sue say [(that) it wasn't going to rain tomorrow ___]?

The *v*P-external elements that yield a complementizer-trace effect do have a property in common that distinguishes them from those that do not: they have all *moved* into the *v*P-external domain to the position

40. Ours is not the first account to entertain the possibility of a bare CP-less clause in the acceptable variant of (73b). Earlier proposals with this property include Doherty (1993/2013, 103 ff.), Erlewine (2017), Rizzi and Shlonsky (2007, 150), and Chomsky (2015, 10 ff.). In contrast, most other attempts to explain the complementizer-trace effect in English, including those surveyed by Pesetsky (2017), assume the continued presence of a complementizer when the subject is extracted, and take it as their main task to determine why the complementizer must be null under these circumstances. In this work, I will attempt a detailed comparison with earlier proposals, in the hope that the generality of the Exfoliation approach speaks for itself.

from which they Ā-move from a lower position within the *v*P. This is true of normal subjects, assuming the VP-internal subject hypothesis, and is self-evidently true of the fronted locative and predicate phrases in (74) — but is not true of the adjuncts in (75), which enter the derivation *v*P-externally.

If movement from *v*P proceeds through the edge of that phase, an alternative generalization emerges that can successfully replace Antilocality. Consider the situation in which an Ā-probe on C finds a goal external to *v*P that has moved there from the edge of *v*P. This goal occupies multiple distinct positions that are all visible to that probe — including the specifier of *v*P and the goal's final position, plus any intermediate *v*P-external positions that the goal might have moved through. By contrast, when such a probe finds an element like *why* that was externally merged outside *v*P (and did not move within the *v*P-internal domain), this goal does not occupy multiple accessible positions. If the presence or absence of multiple accessible positions is the significant factor in blocking vs. permitting movement to the specifier of CP, it suggests that a kind of *Lethal Ambiguity* condition (McGinnis 2004) is at work, rather than Antilocality per se:[41]

(76) **Lethal Ambiguity Antilocality Constraint (LAAC)**
Movement of α to the edge of a phase π is possible only if α occupies a unique position visible in π.

(77) **"Visible"**
α is *visible* in a phase π iff
a. every phase that dominates α also dominates π[42]; or
b. α occupies the edge of phase ρ and every phase that dominates ρ also dominates π (i.e. ρ is the phase constructed immediately before π).

The reference to phase edge is necessary in order to permit multi-step movement to non-phase-edge positions, as when a nominal raises from the specifier of *v*P to form the specifier of *to*P, and continues to undergo phase-internal A-movement to a position such as the specifier of TP. Reference to phase edge as a landing site rather than probe-goal interaction with the phase head will be relevant to a proposal concerning English relative clauses below. Obviously, this raises the question of why movement to the phase edge should be special in this way — a question I will leave open here. In what follows, I will assume that it is (76) that works hand-in-hand with Exfoliation to yield the complementizer-trace effect (though one further emendation will be necessary in section 3.3.1 below)

Under LAAC in (76), an object or other *v*P-internal element that undergoes Ā-movement to the specifier of *v*P position may be directly attracted by an Ā-probe on C without creating any problem, so long as it does not stop at any other position between *v* and C. Notice also that the initial step of movement to the specifier of *v*P in such derivations does not itself violate (76), so long as it proceeds directly from a θ-position or from the specifier position of a lower phase.[43] The same conclusion holds even if the element

41. The contrasts among extractions that do and do not trigger a complementizer-trace effect, along with the proposed account of these contrasts, also argues against drastic proposals that deny that the specifier of CP is ever a possible intermediate landing site for movement (in contrast to the specifier of *v*P) — for example, Den Dikken (2009a, 2009b). Independent arguments that successive-cyclic *wh*-movement may proceed through the edge of CP also militate against a general ban on the specifier of CP as an intermediate landing site (e.g. McCloskey 2000; Van Urk and Richards 2015; Van Urk 2015; Davis 2018a, 2018b).

42. This formulation assumes that domination is reflexive, so π dominates itself.

43. Ā-movement to the specifier of *v*P from the subject position of an R2 infinitive would violate (76) if it stopped off in the specifier position of the higher VP first, since both that position and its earlier position as the specifier of *to*P would be accessible to the Ā-probe on *v*. As we saw in our discussion of *wager*-class verbs, Romance *believe*-class verbs, and the Kayne paradigm, however, (section 2.5.2) there is no reason to assume that the moving phrase needs to stop in the specifier of VP, since direct Ā-movement into the *v*P domain from the specifier of *to*P is possible (and will trigger Exfoliation just as movement to the specifier of VP would).

in question is a nominative-marked *v*P-internal subject of the sort found in languages like Italian (Rizzi 1982; Brandi and Cordin 1981, 1989).

3.2 Adverb amelioration of complementizer-trace effects: more derivational opacity

In sections 2.5.2 and 2.6, derivational opacity arguments were presented for the derivationalist view of infinitivization: generalizations about the subjects of reduced infinitival clauses that are not surface-true, but hold exceptionlessly at an independently motivated derivational stage in which these clauses are full and finite. In this section, I will outline an argument with a similar logic that supports the account of complementizer-trace effects presented in the previous section: that the complementizerless finite clause obligatorily found in English when a subject is extracted started life as a full CP including a complementizer. The argument comes from a repetition constraint on double-complementizer configurations that is also observed when the second complementizer has been removed by Exfoliation, so only one of the complementizers triggering the constraint is present in the surface form.

McCloskey (2006, 23; citing Richard Kayne, personal communication) called attention to the fact that conversational English permits embedded clauses that feature two instances of *that* separated by intervening adverbial material:

(78) **Double-*that* complements**

a. "We know that for all intents and purposes that the government created a rating agency oligopoly that prevented the market from enjoying more competition." (*Congressional Record* vol. 155, pt. 23 p. 31300; http://bit.ly/2ExmceW)

b. "But the simple analysis which suggests that because American investment takes place here that we should be a lapdog for their efforts in the war is one that I think is quite objectionable and quite offensive." (McCloskey 2006, 104 ex. 69a; from *Irish Times*, February 7, 2003)

c. "He thinks that if you are in a bilingual classroom that you will not be encouraged to learn English." (McCloskey 2006, 104 ex. 69b; from Student Essay, California)

I propose that the adverb in such constructions modifies a phonologically null and semantically bleached predicate whose meaning is something like "it is the case that" or perhaps "it may be claimed" — with the result that these constructions are actually bi-clausal (deviating here from McCloskey's analysis):[44]

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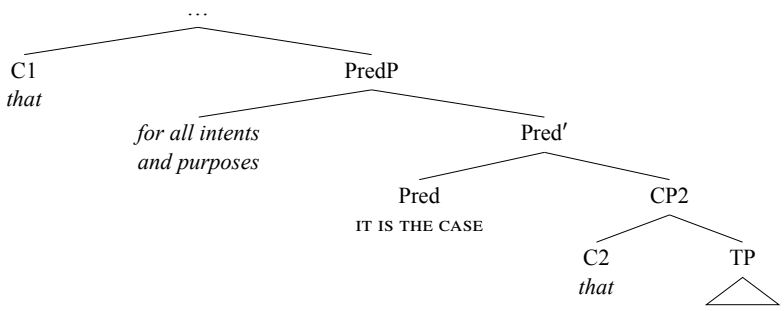
44. McCloskey (p. 105) also discusses Irish English examples with a similar flavor, in which both instances of C are interrogative:

a. Patsy asked him if, when he was sent to college, was it for a clergyman or a solicitor.

b. John was asking me if, when the house was sold, would they move back to Derry.

One might posit an agreement rule that links the interrogativity of a higher complementizer to the interrogativity of the lower. Alternatively, and more in the spirit of the analysis of the declarative clauses discussed in the main text, would be positing a null predicate meaning something like "it is known": e.g. "John was asking me if, when the house was sold, IT IS KNOWN whether they would move back to Derry.

(79) **Double-CP complementation**



McCloskey also noted that the presence of overt material like the adverbial in (79) is obligatory. If the two occurrences of *that* are string-adjacent, the result is unacceptable:

(80) **Unacceptable complementizer doubling**
*We know that that the government created a rating agency oligopoly.

We may account for the effect in (80) with a rule that stigmatizes C immediately adjacent to another instances of C by appending an asterisk to a complementizer that meets the rule's structural description, which causes a sensation of deviance at PF when C is pronounced:

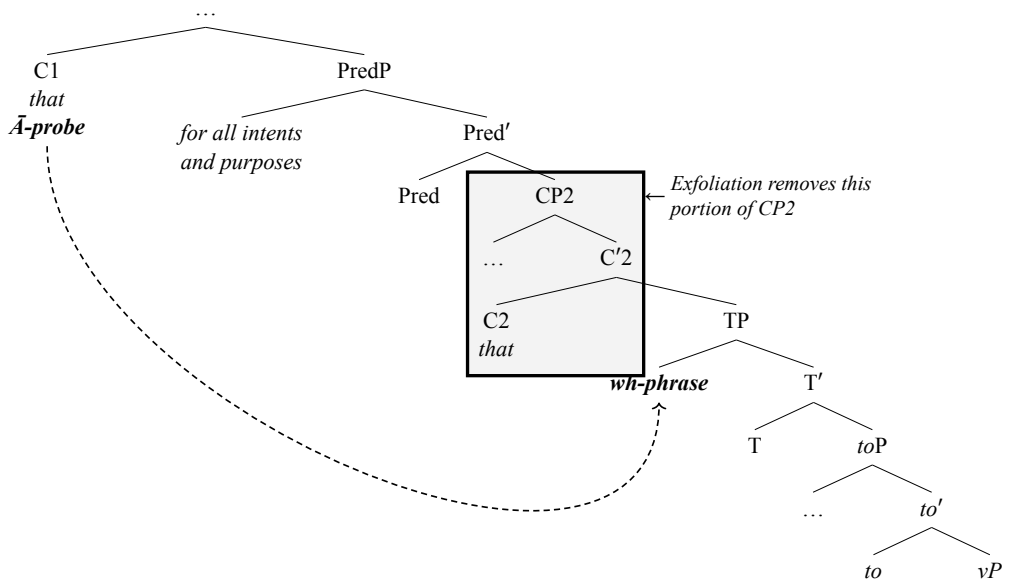
(81) **C Identity Avoidance Rule**
C ⟶ *C / adjacent to a distinct instance of C

The reasons for this specific formulation (rather than a general filter) will become clear in section 3.4, where English complementizerless clauses (without obvious subject extraction) are discussed.

Consider now the predicted consequences of Ā-extracting an element from CP2 in a structure like (79). If the extracted element is the subject, Exfoliation of the CP layer of CP2 should be required — so the lower instance of *that* should obligatorily disappear. No Exfoliation should be required when a non-subject is extracted — permitting the lower instance of *that* to remain. Crucially, nothing requires the *higher* instance of *that* to disappear under either circumstance, since nothing triggers exfoliation of the higher CP. These predictions are correct:

(82) **Apparent amelioration of the complementizer-trace Effect with Double-CP complementation (the "adverb intervention exception")**
a. What kind of rating agency oligopoly did she claim that for all intents and purposes that the government had created ___ ?
b. Which government did she claim that for all intents and purposes (*that) ___ had created a rating agency oligopoly?

(83) **Analysis of (82b)**



The availability of double-CP structures thus offers a legal means for producing a subject extraction that superficially appears to obviate the complementizer-trace effect. I call the appearance of an end run around the complementizer-trace effect merely "superficial", because the overt complementizer that co-occurs with subject extraction is not actually the complementizer of the clause in which the subject originates, but a higher instance of C.

Strikingly, however, the availability of this end run around the complementizer-trace effect is restricted by the effects of the C Identity Avoidance Rule. Apparent violations of the complementizer-trace restriction are limited to constructions in which adverbial material intervenes between the overt complementizer and the extraction site of the subject — or else the field would never have discovered the complementizer-trace effect in the first place (at least for English). This is exactly the phenomenon made famous by Bresnan (1977, 194, fn 6) and Culicover (1993a, 1993b), often described as an "adverb intervention exception" to the complementizer-trace effect . If examples of this "exception" uniformly involve a double-CP structure like (83), there is no actual exception here, just a *faux ami* resulting from the combination of this double-CP structure with subject extraction, which triggers Exfoliation of CP2 but not CP1.

The most important point to note is the counter-bleeding relation between the C Identity Avoidance Rule and Exfoliation. This interaction provides us with a hitherto missing derivational opacity argument for the treatment of complementizer-trace effects advanced here. In previous sections, we studied several effects that can be argued to have tense or agreement as their trigger, but show up in infinitival clauses where there is no overt tense or agreement. These effects argued for a pre-Exfoliation derivational stage in which tense and agreement is actually present, and thus for our overall derivationalist approach to reduced clauses (i.e. clauses smaller than full finite CPs). In this section, the effects of a C Identity Avoidance Rule were detected in structures where only one complementizer is actually pronounced. This supports the derivationalist approach in the same fashion as our earlier derivational opacity arguments, this time with respect to complementizer omission in a clause that remains finite. This provides a crucial missing argu-

ment for our approach to complementizer-trace effects, as well as an account that predicts a phenomenon commonly regarded as an exception to these effects.[45, 46]

3.3 Variation in the surface manifestation of complementizer-trace effects

If the results reported here are correct, long-distance extraction of the subject (or any element with a similar syntax) triggers Exfoliation, reducing the size of the clause from which the subject is extracted. Crucially, Exfoliation is the *only* process that produces reduced clauses (putting aside Restructuring contexts, as we will throughout this work). Having discussed infinitivization at length in earlier parts of this work, we then turned our attention to shallower instances of Exfoliation that eliminate the complementizer but leave the clause finite. We observed that several peculiarities of subject Ā-movement in English followed straightforwardly from Exfoliation interacting with other properties of that languages's syntax.

But the correlation of subject extraction with unusual clausal syntax is far from unique to English. Across the world's languages, we repeatedly observe that extraction of the subject and subject-like elements yields a clausal syntax distinct from the configurations found in other circumstances. This is surely no coincidence, and supports a proposal like ours in which subject extraction universally poses a problem for which the system provides a universal solution. Not surprisingly, Poverty of the Stimulus considerations point in the same direction (Chomsky and Lasnik 1977). As Phillips (2013) shows, examples of any kind of extraction from a clause introduced by *that* in English are so rare in child-directed speech that there is no way that input data can be held responsible for the fact that subject extraction (but not non-subject extraction) is incompatible with overt *that*. (See Pesetsky 2017, 2-3 for further discussion.)

At the same time, the actual appearance of a clause from which the subject has been extracted differs in multiple ways from language to language. In English, the idea that subject extraction reduces clause size has immediate appeal, since a clause from which the subject has been Ā-extracted looks entirely normal except for the absence of the complementizer. In many languages, however, this is not the case. Subject extraction in French and Bùlì, for example, yields a clause in which the normal complementizer is missing, but a different morpheme appears instead. More complicated patterns are also found, in which the consequences of subject extraction seem to depend on other details of the clause, and some languages appear to entirely exclude extraction from the canonical subject position.

In this section, I will argue that despite the diversity of the peculiarities that characterize subject extraction in the languages of the world, the view of complementizer-trace effects advanced here actually predicts this variation, once the ingredients already discussed are supplemented with a universal principle governing the pronunciation of functional heads in a universal sequence. These are the factors that combine to make subject extraction look uniformly "special" across the languages of the world. Cross-linguistic differences in the precise nature of this specialness result from the interaction of these universal properties with the lexical resources of individual languages and a limited repertoire of post-Exfoliation selectional restrictions from which languages may choose. For the time being, I continue to restrict the discussion to instances of Exfoliation that do not eliminate the TP layer, leaving the clause reduced but still finite, returning to non-finite outcomes in later sections.

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45. It is crucial to the analysis that the subject is extracted by a probe on C1 and not by a probe on some lower head — or else Exfoliation would wrongly bleed the C Identity Avoidance Rule. CP1 must therefore lack *v*P.

46. Elise Newman (personal communication) raises the interesting question of why a double CP structure like that in (83) should fail to permit extraction of CP2 as a whole, presumably by successive-cyclic movement via the specifier of CP1, yielding examples like ***That the government had created an oligopoly she claimed that for all intents and surface __*. I will leave this issue open.

3.3.1 *The que~qui alternation in French*

The discussion so far has assumed a structure for the upper phase of a finite clause that consists of the heads C, T, *to* and *v*, in that order — with the position of *to* the major innovation of the proposal. An additional necessary innovation was (24), repeated below:

(84) **Overtness of *to* (= (24))**
English *to* is overt only when exposed.

This innovation, through crucial to the Exfoliation analysis of finite/infinitival alternations, is suspicious because of its *ad hoc* character. While the best outcome of further research would be a derivation of (84) from deeper principles, a second-best outcome would be a demonstration that it is just a special instance of a broader family of rules that link pronunciation to exposure. Such a demonstration would not satisfy us that the problem has been solved but would suggest at least that we have made a true discovery, albeit one not fully understood. I will argue that the so-called *que~qui* alternation in French and similar phenomena in other languages provide a demonstration of just this sort.

As first noted by Perlmutter (1971, 99 ff.), when a subject is Ā-moved from a finite clause in French, the complementizer *que* is impossible. This fact would look just like the French counterpart of the complementizer-trace effect, except for the fact that the word *qui* surfaces in what looks like the same position (Perlmutter 1971, 101-102 fn. 2). For this reason, most accounts of this phenomenon have treated *qui* as an alternative form of *que*, i.e. as a complementizer, with the alternation triggered by some property of the structure particular to subject extraction (Pesetsky 1982a; Rizzi 1990b, 56-58; Taraldsen (2001)):[47]

(85) ***Que~qui* alternation (French)**

a. Qui a-t-il dit **que** Marie voulait voir ___ ? *non-subject extraction*
who has-he said that Marie wanted to.see
'Who did he say that Marie wanted to see?'

b. Qui a-t-il dit **qui** voulait voir Marie? *subject extraction*
who has-he said QUI wanted to.see Marie
'Who did he say wanted to see Marie?' (Perlmutter 1971, 99-122)

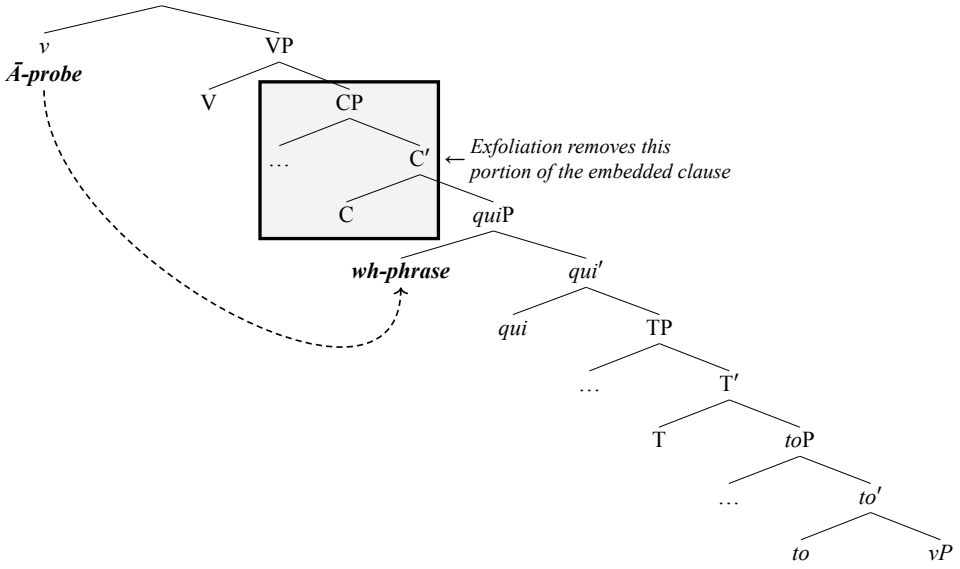
If (84) belongs to a broader class of rules, however, another kind of analysis can be imagined. We might view the embedded clause in (85b) as subject to Exfoliation, and therefore complementizerless — and analyze *qui*, not as an alternative form of the complementizer, but as a lower head distinct from C, with a probe and EPP property that attracts the subject. Crucially, this lower head is overt only when when C is missing, a property that strongly recalls (84):

(86) **Overtness of *qui***
French *qui* is overt only when exposed.

On this analysis, the configuration in (85b) arises when the *wh*-phrase subject raises to form a specifier of *qui*P. From this position, it is unable to be attracted by the Ā-probe on C due to LAAC, as stated in (76) — but is attracted by the Ā-probe on the higher *v*, triggering Exfoliation of the embedded CP. This instance of Exfoliation leaves the embedded clause in (85b) smaller than a full CP, but larger than TP, and the gap is thus located to the left, not the right, of *qui*:

47. The position of the subject gap in (85b) is not indicated for reasons that will be clear immediately below.

(87) **Exfoliation of only CP layer, leaving *qui*P (French)**



For this analysis to achieve the desired result, the theory must exclude an alternative derivation in which the subject raises only as far as T, leaving the EPP property of *qui* unsatisfied. Exfoliation would then eliminate *qui*P as well as CP, yielding an alternate version of (85b) that lacks both *que* and *qui* — in essence, a French version of the English result when a subject is Ā-extracted. Non-satisfaction of the EPP property of *qui* should not yield deviance any more than non-satisfaction of EPP on T yields deviance in the derivation of an infinitival clause. A bare TP outcome of Exfoliation is, however, unacceptable in French:

(88) **Exfoliation of *qui*P as well as CP, leaving a bare TP (French)**

*Qui	a-t-il	dit	___	voulait	voir	Marie?
who	has-he	said		wanted	to.see	Marie

As we noted in chapter 1, however, selectional requirements of heads can in principle be imposed at any point in the derivation, in modern models of syntax without a level of Deep Structure. If French generally bars TP as a complement to V, the derivation that yields (88) will be filtered out by this selectional restriction:[48]

(89) **Selectional property (French)**
*[V TP]

A more specific filter with a similar character might further restrict the availability of *qui*P clauses as arguments of higher predicates. Godard (1986, 55-56) presents judgments that support the following generalization (dubbed "Godard's Generalization by Koopman and Sportiche 2014):

48. Because this restriction and others like it are stated negatively (excluding a particular configuration), several different assumptions about where this restriction is imposed are compatible with the facts: throughout the derivation (as an "everywhere" restriction), when the next phase is complete, or at the end of the derivation.

(90) **Godard's Generalization**
Ā-extraction of the subject from a finite clause introduced with *qui* as in (85b) is possible only when the higher predicate also allows Kayne-paradigm Ā-extraction of the subject from a corresponding infinitival clause like (41b).

For Godard, both types of extraction are possible with a class of verbs that includes *dire* 'say', *croire* 'believe', *penser* 'think', and *savoir* 'know'; less acceptable with *prétendre* 'claim', *supposer* 'suppose', *juger* 'judge', and *estimer* 'feel'; and impossible with verbs like *vouloir* 'want' and *désirer* 'desire'. On the theory under discussion, what is at stake is the ability to tolerate any clausal complement smaller than CP, including *qui*P and *to*P. As a shortcut, let use the feature [+F] to designate the predicates that tolerate such a complement with the feature (Chomsky and Lasnik (1977, 486 ff.)):

(91) **Godard's generalization as a selectional property (French)**
*[-F *x*], where *x* is a clausal projection smaller than CP

The fact that Godard's generalization is so easy to state in an Exfoliation analysis that views both *qui*-clauses and infinitival clauses as smaller than CP counts as a weak but real argument in its favor. Furthermore, the claimed impossibility of *qui* with verbs of desiring such as *vouloir* 'want', which take subjunctive complements, may suggest a role for *qui* as a privative indicative marker (i.e. a marker absent in subjunctive clauses).[49]

3.3.2 *WP superstructures*

The complementizer-trace effects discussed in preceding sections involve long-distance extraction from an embedded declarative clause. Some languages, however, show these effects with (what appear to be) short-distance extractions as well. This fact will turn out to be important to the solution of an outstanding puzzle concerning short-distance subject extraction even in English, the topic of the next subsection. This discussion in turn will provide a crucial stepping stone to a broader survey of variation in complementizer-trace effects.

One example of a complementizer-trace effect in what looks like short-distance extraction was noted by Henry (1995, 107 and 141 fn. 2) in her study of the Belfast dialect of Irish English. Henry observed that Belfast English, unlike Standard English, permits indirect questions to be introduced by a non-subject *wh*-phrase moved immediately followed by the complementizer *that.* Crucially, however, a *wh*-phrase moved from the local subject position may does not permit *that*, as (92b) shows:

(92) **Complementizer-trace effect in short-distance questions (Belfast English)**
a. I wonder which dish that they picked ___ . *object extraction*
b. I wonder which author (*that) ___ wrote this book. *subject extraction*
(Henry 1995, 107 ex. (27) and 141 fn. 2 ex. (9))

49. Unfortunately, some key judgments appear to vary among speakers. Koopman and Sportiche (2014, 54), for example, disagree with Godard in allowing subject extraction with *qui* for desiderative verbs like *vouloir*, while blocking comparable extraction from an infinitival complement to the same verb. This could perhaps be described in an Exfoliation framework, but without the neatness of (91). Koopman and Sportiche also exclude manner-of-speaking verbs and non-attitude predicates such as *parier* 'bet' from the class of [+F] predicates — but in this respect differ from the experimental subjects whose judgments are reported by Berthelot (2017, 159), for whom no reduction in acceptability was detected with *prétendre* and no contrast is found with *parier* 'bet' either. Furthermore, Berthelot's speakers generally found *qui* with subjunctive complements to desiderative verbs *more* acceptable than with indicative complements to verbs of believing and saying. Thus, while Godard's generalization (for relevant speakers) provides support for an Exfoliation approach to the *que~qui* alternation, the empirical picture would benefit from some sharpening.

Since Standard English disallows (92a) as well as (92b), there must be some restriction on the overtness of the complementizer in Standard English that the Belfast dialect manages to evade. Keyser (1975, 27 ex. 66), Chomsky and Lasnik (1977, 446 ex. (53)), and much subsequent work posited a special "Doubly Filled Comp Filter" specific to the C-system to exclude examples like those in (92). An updated statement of their proposal is given in (93) below. A terminological note: a head "retains" a specifier when that specifier does not move further in the course of the derivation (cf. Rizzi's 2006 notion of a "criterial" position):

(93) **The "Doubly Filled Comp Filter" effect**
C is unpronounced if it hosts and retains a specifier.[50]

It may be observed at this point that there is some kinship between between (93) and the pronunciation conditions on English *to* and French *qui* discussed in previous sections. Both kinds of conditions specify the circumstances under which a functional head in the domain above *v*P is pronounced or unpronounced, and both single out phase heads, explicitly or implicitly. Since C is always a phase head, a statement exactly like the formulations applicable to *to* and *qui* would be satisfied trivially. Since *to* and *qui* become phase-heads only as a consequence of Exfoliation, they would also satisfy a statement about them that was modeled on (93) (in caring about hosting and retention of a specifier) whenever they also satisfy the conditions that permit them to be pronounced only when heading a phase. These considerations suggest that we are dealing with a unified notion of *exposure* relevant to pronunciation that makes reference to both phase-head status and retention of a specifier. Let us therefore expand the notion of *exposure,* and generalize the overtness conditions proposed for *to* and *qui* to all functional heads in the relevant domain:

(93) **Exposure (final version; revision of (23)**
α is *exposed* iff it heads a phase and does not retain a specifier.

(94) **Exposure Condition (version 1; replaces item-specific overtness conditions above)**
A functional head[51] [external to *v*P] is overt only if exposed.[52]

Most important, let us explore the possibility that the Exposure Condition is not particular to specific languages or individual functional heads — but is universal and general, at least for the functional heads higher than *v.* The bracketed exclusion of functional heads internal to *v*P is not a matter of principle, but merely reflects the fact that they have not been a principal object of study in this work, so I am not confident about the extension of the Exposure Condition to them.

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50. Reference to specifier retention is employed instead of reference to the overtness of the specifier — which would have been a more faithful updating of Keyser's and Chomsky and Lasnik's proposals. That reference to overtness is inappropriate is indicated by the possibility in West Ulster English of pronouncing in the specifier of CP a pluralizing morpheme *all* stranded by a *who* or *what* that has moved on (McCloskey 2000). This stranded *all* is free to cooccur with an overt complementizer:
What did he say all that he wanted to buy ___ ? (McCloskey 2000, 62, ex. (11b))
If this construction involves scattered pronunciation of *who all* rather than literal stranding, the formulation of the effect in (93) covers this case. The generalization of (93) that follows will reinforce this point.
Reference to overtness would be necessary if we were to adopt the contemporaneous proposal that relative clauses such as *the book that I read* involve Ā-movement of a phonologically null operator, which may co-occur with an overt complementizer, which partly motivated the Doubly Filled Comp Filter. This problem disappears, however, if we adopt the proposal for such relatives discussed in section 3.4.2.

51. I intend "functional head" to exclude elements that may have been adjoined to that head, as in traditional views of head movement. The Exposure Condition does not, for example, silence a verb that may have moved to C.

52. The status of tense and agreement morphology assigned by T will be taken up shortly; cf. (108) below.

Note finally that (94) is stated as a conditional, and not a biconditional, permitting functional heads to be null for other reasons. I will suggest below that the condition can in fact be strengthened to a biconditional, but other results must be in place before we can explore this possibility.

Let us now consider what must be proposed when a language such as Belfast English appears to violate (94) . If we assume that the Exposure Condition (and thus the Doubly Filled Comp Filter effect) is universal, then an example like (92a) must be showing *wh*-movement to a position *above* the embedded CP — a position available in Belfast English, but not in dialects of English where (92a) is impossible. I therefore propose that Belfast English permits an interrogative *superstructure* to be built above a phasal declarative CP. The specifier of this superstructure, not the specifier of the CP below it, is the actual final landing site for Ā-movement in an interrogative clause like the embedded clause of (92a). The CP itself merely hosts successive-cyclic movement into this superstructure.

I will call this superstructural projection **WP** (*W* for *"wh*"), and assume that W takes a normal phasal declarative CP as its complement. Ā-features with interpretive properties such as interrogativity that are otherwise be associated with C are instead associated with W when a WP superstructure is deployed. In effect, if WP is built, apparent examples of short-distance Ā-movement of the subject actually have the syntax of long-distance movement. This proposal immediately predicts the possibility of subject extraction triggered by the Ā-probe on W, with no violation of LAAC, and also correctly predicts the obligatory absence of *that* under such circumstances as seen in (92b) — since even if WP is deployed above CP, the extraction of the embedded subject to the specifier of W position triggers Exfoliation of the CP layer:

(95) **Exfoliation in short-distance questions (Belfast English)**

a. I wonder [$_{WP}$ which dish W [$_{CP}$ ___ that [$_{TP}$ they picked ___]].

b. I wonder [$_{WP}$ which author W [$_{CP}$ that [$_{TP}$ ___ wrote this book]]].

(*Exfoliation deletes the structure in gray circles.*)

In addition, the universality and generality of the Exposure Condition in (94) correctly predicts that W itself should be phonologically null, since its specifier is a "criterial" position (in the sense of Rizzi 2006), and is therefore retained by W The fact that the specifier of CP is not criterial and is therefore not retained by C is what permits the phonological realization of C as *that* in examples like (92a).

This scenario is not limited to Belfast English. Igbo short-distance questions, for example, appear to show exactly the same pattern as Belfast English (Amaechi and Georgi 2017, 2019), and can therefore be accorded the same analysis — with the additional twist that the WP superstructure (and thus the appearance of a Doubly Filled Comp effect violation) is obligatory:[53]

53. Amaechi and Georgi (2017, 2019) present two arguments that the subject in a short-distance subject question like (96b) remains in situ, rather than moving at all. One argument arises from a tonal downstep on the verb triggered by long-distance movement of an interrogative subject and subject relativization, but not by putative short-distance movement of an interrogative *wh*-element. The configuration that fails to trigger the downstep is also unique, however, in showing an overt *wh*-form immediately preceding the verb, so it is perhaps possible that this, rather than the absence of movement, is the relevant factor. Their other argument concerns conjunction: the strong ungrammaticality of any attempt at ATB extraction of an interrogative *wh*-form in which the putative extraction site in one, but not all, conjuncts is the local subject. This might well follow on the Exfoliation approach from the fact that Exfoliation will render such examples instances of coordination of non-likes: TP with CP, if W' coordination is excluded (perhaps because conjuncts must be maximal projections).

(96) ***kà~∅* alternation in short-distance questions (Igbo)**

a. Ònyé kà Òbí hụ̀rụ̀ n'-áhíá *object extraction*
who COMP[54] Obi saw P-market
'Who did Obi see at the market?'

b. Ònyé (*kà) hụ̀rụ̀ Àdá n'-áhíá *subject extraction*
who (*COMP) saw Ada P-market
'Who saw Ada at the market?'

(97) **Exfoliation in short-distance questions (Igbo)**

a. [$_{WP}$ Ònyé W [$_{CP}$ ___ kà [$_{TP}$ Òbi hụ̀rụ̀ ___ n'-áhíá]].

b. [$_{WP}$ Ònyé W [$_{CP}$ kà [$_{TP}$ ___ hụ̀rụ̀ Àdá n'-áhíá]]].

(*Exfoliation deletes the structure in gray circles.*)

The WP proposal transposed into French should yield a *que~qu*i alternation, a correct prediction. In variants of French such as Québécois that permit violations of the Doubly-Filled Comp effect, an extracted non-subject may co-occur with the finite declarative complementizer *que*, as seen in (98a). When a subject is extracted, however, *que* does not appear, but *qui* does (Bouchard 1984, 127 ex 156), just as if the extraction were long-distance, responding to a probe external to CP, as seen in (98b):

(98) ***Que~qui* alternation in short-distance questions (dialects of French)**

a. Je me demande qui **que** Marie voulait voir ___ ?
I wonder who C Marie wanted to.see
'I wonder who Marie wanted to see?'

b. Je me demande qui ___ **qui** voulait voir Marie.
I wonder who QUI wanted to.see Marie
'I wonder who wanted to see Marie.'

Once again, I propose that the final movement step is triggered by a probe external to CP, and thus actually constitutes extraction out of a declarative CP, despite appearances:[55]

54. Amaechi and Georgi gloss *kà* as a focus marker.

55. I distinguish the grammatical formative *qui* that heads *qui*P from the homophonous animate *wh*-form *qui* 'who', indicated here with a subscript *wh* (following Kayne 1977, 265ff and others). Complex *wh*-phrases such as *quelle femme* 'which woman' are not very acceptable in constructions like (98a-b), for unclear reasons (Marcotte 2006; confirmed by Paul Hirschbühler and Jillian Mills, social media communication). Since *wh*-questions formed with *what* have complications of their own independent of the issues at hand (Koopman 1982b, 1983), the best examples of constructions like ((98b)) inevitably involve *qui$_{wh}$,* confusing though the homophony may be. Puzzlingly, Henry (p.140, fn. 3) notes that for some speakers the corresponding constructions in Belfast English are limited to *wh*-questions like those in (92), in which the fronted *wh*-phrase is not bare *who* or *which*, but phrasal — the exact opposite of the French restriction. The fact that the construction in both languages shows the predicted consequences of Exfoliation triggered by subject movement to the specifier of WP suggests, however, that the analyses should not be too distinct, despite this surprising contrast in allowable *wh*-elements.

(99) **Exfoliation in short-distance questions (dialects of French)**

a. Je me demande [$_{WP}$ qui$_{wh}$ W [$_{CP}$ ___ que [$_{qui}$P Marie ø$_{qui}$ voulait voir ___]].

(ø$_{qui}$ *unpronounced due to* (*86*))

b. Je me demande [$_{WP}$ qui$_{wh}$ W [$_{CP}$ que [$_{qui}$P ___ qui voulait voir Marie]]].

(*Exfoliation deletes the structure in gray circles.*)

Precisely the same analysis may be given for what looks like the same alternation in Bùlì, where short-distance extraction of the subject yields a clause introduced by the morpheme *ālì*, while non-subject extraction yields a clause introduced by *ātì.* (All Bùlì data in this section, and the main lines of analysis, are due to Sulemana 2017, except where indicated.)

(100) ***ātì~ālì* alternation in short-distance questions (Bùlì)**

a. (Ká) b^{w}ā **ātì** bí:ká dìgì: ___ ? (subject extraction)
Q what ĀTÌ child.DEF cook
'What did the child cook?'

b. (Ká) wānā ___ **ālì** dìg lāmmú:? (subject extraction)
Q who ĀLÌ cook meat.DEF
'Who cooked meat?'

If this apparent alternation is indeed the Bùlì counterpart of French *que~qui*, then the *wh*-movement gaps are correctly situated in (100a-b) above. Bùlì clauses include a phrase headed by *ālì* analogous to French *qui*P between C and T, and a rule like (101) analogous to that posited for *qui* in (86) regulates the overtness of *ālì.*

(101) **Overtness of *ālì***
Bùlì *ālì* is overt only when exposed.

I will call the head represented by Bùlì *ālì* and French *qui* ALIQUI (to honor both languages).[56] Bùlì differs from French in that there is no option to omit WP and assign the semantic function of W to C. Consequently Bùlì does not permit variants of constructions with overt Ā-movement that omit *ātì* and *ālì.*

Exfoliation removes the CP but not the ALIQUIP layer in examples like (100a), yielding the appearance of an alternation between *ātì and ālì*, though in fact they occupy distinct positions:

56. As was the case with *to*P, I have deliberately chosen an uninformative name for this category, to bookmark the fact that we leave important questions open concerning the category's function — independent of the evidence for its existence presented here. In footnote 7, I took note of a possible identification of our *to*P and TP with the TP and FINP (respectively) of Rizzi's (1997) cartographic proposals. Alternatively, however, one might identify Rizzi's TP with our TP and Rizzi's FINP with our ALIQUIP (leaving *to*P as a category without a correspondent in the cartographic literature). I continue to leave these issues as a question for future investigation.

(102) **Exfoliation in short-distance questions (Bùlì)**

a. [$_{WP}$ Ká b^{w}ā W [$_{CP}$ ___ ātì [$_{ALIQUIP}$ bí:ká ø$_{āli}$ dìgì: ___]].

(ø$_{āli}$ *unpronounced due to* (*101*))

b. [$_{WP}$ Ká wāna W [$_{CP}$ ātì [$_{ALIQUIP}$ ___ ālì dìg lāmmú:]]].

(*Exfoliation deletes the structure in gray circles.*)

Bùlì is of particular interest because it offers an argument from the positioning of adverbs in favor of the hypothesis that *ālì* occupies a lower position than *ātì*, discovered by Sulemana. An adverb like *ɲīem* 'usually' follows *ātì* and the subject when an object is extracted, but precedes *ālì* when the subject is extracted. (Sulemana shows similar data for *diēm* 'yesterday'.) This is predicted by the analysis proposed here if the adverb is merged in the ALIQUIP-domain, *ātì* instantiates the higher head C, and the subject occupies the specifier of ALIQUIP:

(103) **Adverb order with *ātì* and with *ālì* (Bùlì)**

a. (Ká) b^{w}ā **ātì** Azuma **ɲīem** á dīgī? (object extraction)
Q what ĀTÌ (C) Azuma usually IPFV cook
'What does Azuma usually cook?'

b. (Ká) wānā **ɲīem** **ālì** á dīgī lām? (subject extraction)
Q who usually ĀLÌ (ALIQUI) IPFV cook meat
'Who usually cooks meat?'

Unexplained, unfortunately, is the requirement that adverbs like Bùlì 'usually' merge in the ALIQUIP domain, and the apparent fact that comparable adverbs in French do not merge in this domain (since Sulemana's argument cannot be reproduced for French). Despite these unresolved issues, the Bùlì paradigm may nonetheless be taken as a demonstration that an apparent alternation of the *que~qui* type does represent the pronunciation under complementary conditions of two heads in distinct positions.

One might still wonder whether Bùlì *ātì~ālì* and French *que~qui* might be syntactic *faux amis*, so that conclusions reached about the analysis of the Bùlì alternation do not shed light on the French alternation. In this connection, it may be useful to observe (with Sulemana) that Bùlì *ālì* and French *qui* travel together in a second context as well: as a post-subject marker in direct perception complements to verbs like 'see', a construction known in the as the "pseudorelative" (because of its superficial resemblance to subject relative clauses in Romance languages, where they were first studied):

(104) **Pseudorelatives use *qui* (French) and *ālì* (Bùlì)**

a. J'ai vu Marie **qui** rit. (French)
1SG AUX see.PTCP Marie ALIQUI laugh
'I saw Marie laugh.'

b. Mí ɲà Asouk **ālí** à lā (lā). (Bùlì)
1SG see.PST Asouk ALIQUI IPFV laugh PTCL
'I saw Asouk laugh.'

We might seek an analysis of the pseudorelative construction modeled on R2, if the subject can be shown to raise from its original clause, either into the higher verb phrase or into a clausal superstructure along

the lines of the WP posited above.[57] The constituent structure of pseudorelatives cross-linguistically is controversial, however, and I will not explore the construction beyond its ability to hint that Bùlì *ālì* and French *qui* might indeed be counterparts.

Long-distance extraction of subjects and non-subjects behaves as predicted in Bùlì. While extraction of a non-subject from an embedded clause may co-occur with overt complementizers in both clauses (with no *ālì*), extraction of a subject from an embedded clause yields *ālì* and no overt complementizer in that clause (and *ātì* but no *ālì* in the main clause).

(105) ***ātì~ālì* alternation in long-distance questions (Bùlì)**

a. (Ká) bʷā **ātì** fì pá:-chīm **āyīn** mì dìgì: ___ ? (object extraction)
Q what ĀTÌ (C) 2SG think C 1SG cook
'What do you think I cooked?'

b. (Ká) wānā **ātì** fì pá:-chīm wà **ālì** dìg lāmmú:? (subject extraction)
Q who ĀTÌ (C) 2SG think 3SG ĀLÌ (ALIQUI) cook meat
'Who do you think cooked the meat?'

There are two twists that must be mentioned, however, First, on the analysis developed here, where W rather than C is the locus of interrogative or focus semantics in Bùlì, *ātì* must be analyzed as a declarative complementizer selected by W, rather than as the locus of interrogative or focus semantics in its own right, as Sulemana proposes. The embedded clause of (105a) contains a different complementizer *āyīn* selected by 'think'. It and several other complementizers selected by particular predicates are thus simply forms of C *not* selected by W.

Second, it is surprising but also significant that the subject extraction in (105b) leaves a (mandatory) pronoun *wà* where we expect a gap. This pronoun, which agrees with the *wh*-phrase in noun-class, has been argued by Sulemana (in prep.) to have the status of a pronounced trace of movement rather than a resumptive pronoun — since the relation between the *wh*-phrase and the pronoun is sensitive to islands. As a pronounced trace, it does not count as a specifier "retained" by *ālì*, permitting *ālì* to be overt without violating the Exposure Condition in (94). Sulemana also shows that the pronoun is not an instantiation of verbal agreement, but occupies the normal subject position, and, crucially, that such a pronoun is obligatory whenever the subject is extracted, no matter by what kind of probe. In particular, A-movement in R1 configurations leaves a pronoun (also found in some obligatory control complements). Consequently, the presence of the pronoun in (105b) provides an argument that the construction involves movement. The reason why the pronoun must appear in the first place is, however, not addressed by the proposals developed here.

3.3.3 *Short-distance subject extraction*

Standard English and Standard French do not in general permit apparent violations of the Doubly Filled Comp filter of the sort discussed in the previous section that motivated WP superstructures. We might therefore conclude that WP is entirely missing from these languages. These languages present an additional puzzle, however, which suggests a different conclusion.

All things being equal, the Antilocality effect engendered by LAAC should completely exclude short-distance Ā-movement to C from any position external to *v*P but lower than C. Questions like those in (106), for example, should be impossible as an instance of *wh*-movement to C from the specifier of TP:

57. See Koopman and Sportiche 2014 for a broader attempt at a unified analysis of the *qui* of subject extraction and pseudorelatives (building on Kayne 1977, 268-9).

(106) **Short-distance movement of subject**

a. I wonder who has read the book.

b. Je me demande qui a lu le livre. (French)
I wonder who AUX read the book

One might imagine alternative analyses that invoke a strategy other than local movement from the specifier of TP to the specifier of CP (Rizzi and Shlonsky 2007, 119) — for example, "skipping" (Rizzi and Shlonsky's term for direct movement into the CP domain from the edge of *v*P without an intermediate stop in a higher specifier position); or in-situ interpretation without movement (cf. Beck 2006, Kotek 2014a). While skipping appears to be the solution to this problem in languages like Standard Italian, Fiorentino or Trentino that more generally permit the subject to remain *v*P-internal (Rizzi 1982; Brandi and Cordin1981, 1989), it is an unlikely proposal for languages like French and English that lack this option .

In-situ solutions for English short-distance subject *wh*-constructions, on the other hand, have been proposed for English by Chung and McCloskey (1983), Chomsky (1986, 48 ff.), and Brillman and Hirsch (2014), among others — principally because such constructions yield weaker *wh*-island effects for some speakers than counterparts with non-subject extraction. If the subject *wh*-phrase remains within TP in embedded questions like (106a-b), however, we must also determine whether the embedded clause as a whole is a CP or a bare TP. If we analyze it as a CP, the obligatory nullness of C is a mystery, if the subject does not undergo movement to the specifier of CP, where the Doubly Filled Comp Filter effect would cover the situation. If one pursues the possibility that the construction is a bare TP, however, it will be necessary to abandon the Full CP Hypothesis (16), an essential component of all the results of this work so far. For French, it would be necessary to abandon (91) as well, since this would be an instance of a bare TP not produced by Exfoliation.

If examples like (106a-b) can be analyzed as involving Ā-movement into a WP superstructure that embeds a phasal CP, however, these difficulties do not arise. Phase Impenetrability will require Exfoliation of that CP — and if the result is a TP complement to C, (106a-b) are derived. The challenge is to permit this derivation while disallowing derivations in which a non-subject is extracted and the CP complement to W does not undergo Exfoliation, to block apparent Doubly Filled Comp Filter violations like (95a) and (102a). An additional challenge for Standard French is blocking a derivation under which Exfoliation reduces a complement clause to ALIQUI rather than TP, to avoid (102b) in standard dialects. The fact that selectional properties may be imposed throughout the derivation permits these restrictions to be stated as a selectional restriction of W:[58]

(107) **Selectional property (Standard English and Standard French)**
*[W {ALIQUIP, CP}]

The formulation in (107) may be extended if it turns out that there are other potential post-Exfoliation complements to W that must be excluded (including *to*P, to which I return below), but will do for now. For the remainder of this chapter, however, I will assume that the functional sequence between C and *v* is universally limited to C, ALIQUI, T and *to*. Though it may be objected that a deeper proposal might derive language-specific stipulations like (107) from more general properties of the languages for which they are true, it is still important to observe (as we discuss below) that the range of selectional statements permitted

58. Selectional restrictions are stated negatively (as filters) in this work, because this format makes the consequences of the restrictions easier to keep in mind. If the categories forming a clause are fixed cross-linguistically, we could equally well state these properties positively, as in Chomsky 1965: e.g. [+__ TP] as a property of W rather than (107).

by the theory is limited, and appears to predict to a first approximation much of the range of variation in subject/non-subject asymmetries reported in the literature.

3.3.4 *The Exposure Condition as a biconditional*

I propose that the core components of the proposal advanced in this work are universal, i.e. fixed properties of the human language faculty:

(a) Full CP hypothesis (16)
(b) Phase penetrability/impenetrability (20)
(c) Exfoliation (21)
(d) LAAC (76)

In addition, I now advance the possibility that the rules determining the overtness or phonological nullness of elements in the functional sequence between C and *v* are also universal and fixed — contrary to appearances and what is generally supposed. I thus propose that a language may not specify a morpheme such as ALIQUI, for example, as phonologically null. When such a morpheme is phonologically unrealized in a given construction of a language, it is always and only because of the Exposure Condition that it is phonologically null. There is always an overt pronunciation available for it in principle. I therefore propose that the following statements are also cross-linguistically true, among others:

(e) *to* is overt if and only if exposed.
(f) ALIQUI is overt if and only if exposed.
(g) C is overt if and only if exposed.
(h) W is overt if and only if exposed.

For the time being, let us ignore *to*P complementation as a possible outcome of Exfoliation. Let us also ignore the question of null C in languages like English that show an apparent optionality in the use of *that* to introduce embedded declarative clauses, until we return to this topic in section 3.4.

The claim in (f) permits us to avoid stipulating that certain languages, such as English, lack ALIQUI as an explanation for the fact that subject extraction does not yield an overt ALIQUI morpheme as it does in French and Bùlì. If both W and predicates such as V reject ALIQUIP complementation, Exfoliation triggered by subject extraction will yield a clause no larger than TP, thus excluding ALIQUI — and clauses without subject extraction will never show overt ALIQUI, thanks to (f). On this view, both Standard and Belfast English have an ALIQUI after all, pronounceable in principle, but generally unpronounced for selectional reasons. Bùlì, Standard French and Non-standard French, by contrast, exclude TP as a complement of W and predicates such as V, with the result that ALIQUI is overt under subject extraction.

Absent from the list above is T, which, when exposed by subject extraction in a language like English, does not appear as an overt morpheme as ALIQUI does under comparable circumstances in French and Bùlì. This fact might be attributable to the fact that T commonly assigns morphology to a verb (main or auxiliary), which might be taken as satisfying the Exposure Condition in another way. While this proposal raises questions about languages that appear to lack tense or subject agreement morphology, I will leave these questions open, accepting the possibility that the special property of T may ultimately need some other explanation, and tentatively propose (108) as the general principle underlying (f)-(h)

(108) **Exposure Condition (biconditionalized — final)**
A functional head external to *vP* is overt if and only if (i) it is exposed and (ii) its features are not assigned as morphology to the verb.

3.3.5 *Variation attributable to selection*

What does the work of regulating the nullness and overtness of the functional heads above *v*P on this view are the selectional restrictions of elements that take CP as a (pre-Exfoliation) complement. Let us therefore take stock by considering one by one the patterns predicted by different selectional options for W and V (which I will take as representative of the class of argument-taking categories, arguably also including A and N) — and how they are exemplified in individual languages.

We first consider selectional restrictions that exclude some single category as a complement to W, but allow others. The consequences of excluding TP or AliquiP have already been discussed and exemplified in preceding discussion.

(109) ***[W TP]**

Consequences:
WP possible ⟶ *wh* + C sequences permitted
Short-distance subject extraction with obligatory aliqui

Examples:
Non-Standard French (98), *Bùlì* (100)

(110) ***[W AliquiP]**

Consequences:
WP possible ⟶ *wh* + C sequences permitted
Short-distance subject extraction with no aliqui

Examples:
Belfast English (92), *Igbo* (96)

Unfortunately, I do not know of a language exemplifying the predicted consequences of excluding only CP:

(111) ***[W CP]**

Consequences:
WP possible only under Short-Distance subject extraction ⟶ *wh* + C sequences not permitted
Short-distance subject extraction with optional aliqui

Examples:
unknown

If the exclusion of TP is added to (111), however, so that only AliquiP is permitted as a complement to W, the result should be a language in which only short-distance subject extraction is compatible with WP. Thus there should be no *wh*+C sequences observed with non-subject extractions, but an Aliqui morpheme should obligatorily appear under short-distance extraction of the subject. One such a language is Kreyòl (Haitian Creole), where a morpheme *ki*, which we may identify as Aliqui, surfaces obligatorily under short-distance subject extraction, but not when a non-subject is extracted, yielding an apparent ∅~*ki* alternation.

(112) **∅~*ki* alternation in short-distance questions (Kreyòl)**

a. Kilès Mari te wè? (object extraction)
who Mari ant see
'Who did Mari see?'

b. Kilès *(ki) te wè Mari? (subject extraction)
who *(aliqui) ant see Mari
'Who saw Mari?'
(Takahashi and Gračanin-Yuksek 2008, 223 ex. (1); Michel DeGraff, personal communication)

Another example is the standard dialect of Norwegian described by Taraldsen (1986) (restricting our attention to embedded questions), where we may identify as ALIQUI the morpheme *som* that surfaces obligatorily under short-distance subject extraction but not otherwise:

(113) **∅~*som* alternation in short-distance questions (Norwegian)**

a. Vi vet hvem Marit snakker med. (object extraction)
We know who Marit talks with
'We know who Marit is talking with.'

b. Vi vet hvem *(som) snakker med Marit. (subject extraction)
We know who *(ALIQUI) talks with Marit
'We know who is talking with Marit.' (Taraldsen 1986, 150 ex. (7)-(10))

(114) ***[W {TP, CP}]**

Consequences:
WP possible only under Short-Distance subject extraction ⟶ *wh* + C sequences not permitted
Short-distance subject extraction with obligatory ALIQUI

Examples:
Kreyòl, Norwegian

If we add exclusion of ALIQUIP to (111) rather than TP, the result is the pattern of Standard English or Standard French short-distance subject questions, as discussed immediately above:

(115) ***[W {ALIQUIP, CP}]** (= 107)

Consequences:
WP possible only under Short-Distance subject extraction ⟶ *wh* + C sequences not permitted
Short-distance subject extraction with no ALIQUI

Example:
Standard English, Standard French

If ALIQUIP and TP are excluded as complements to W, but CP is permitted, apparent violations of the Doubly Filled Comp filter (*i.e. wh*+complementizer sequences) will be permitted for non-subject extraction — but there should be no legal path for short-distance subject extraction from the domain above *v*P. Movement to the specifier of CP from a *v*P-external subject position will be blocked by LAAC. Movement to the specifier of WP, by triggering Exfoliation, will yield a structure that violates one or another of W's selectional restrictions. As a consequence, a subject question can only be formed by a strategy such as skipping — moving the subject to the specifier of CP or WP directly from inside *v*P, without stopping off in a VP-external position.

A language that appears to fits this description is Veneto (a Northern Italian dialect). According to Cecilia Poletto (personal communication), Veneto provides the same argument as other Northern Italian dialects that short-distance subject questions obligatorily employ the skipping strategy. Like Fiorentino and Trentino as discussed by Brandi and Cordin (1981, 1989), Veneto requires a preverbal subject to be doubled by a agreeing clitic on the verb, that is obligatorily absent when the subject is postverbal (and presumably *v*P-internal). The clitic is also obligatorily absent when the subject is Ā-moved, whether short-distance or long-distance (Poletto 1995, 299), suggesting that Ā-movement is possible only from the *v*P-internal position. Crucially, Veneto also permits apparent violations of the Doubly Filled Comp filter:

(116) **Non-subject vs. subject extraction cooccuring with *wh*+C sequences (Veneto)**

a. Non so chi che el ga visto. (object extraction)
NEG know.1SG who COMP SCL.3MSG has seen
'I do not know who he saw.'

b. Non so chi che (*el) ga telefoná. (subject extraction)
NEG know.1SG who COMP (*SCL.3MSG) has phoned
'I do not know who phoned.' (Cecilia Poletto, personal communication)

(117) ***[W {ALIQUIP, TP}]**

Consequences:
WP possible ⟶ *wh* + C sequences permitted
no SD subject extraction (except via a strategy such as skipping)

Example:
Veneto

If CP, ALIQUIP and TP are all forbidden as complements to W, the result is a language in which WP itself is effectively forbidden. This yields a language just like Veneto in blocking short-distance subject extraction from the domain above *v*P, but differs from Veneto in disallowing apparent violations of the Doubly Filled Comp filter. Standard Italian and the Northern Italian dialects Fiorentino and Trentino appear to be examples of this:

(118) ***[W {CP, ALIQUIP, TP}]**

Consequences:
WP not possible ⟶ *wh* + C sequences not permitted
no SD subject extraction (except via a strategy such as skipping)

Examples:
Standard Italian, Fiorentino, Trentino

As we have seen, a language may also impose selectional restrictions on declarative clausal complements to predicates such as V — which may affect the appearance of the clause under subject vs. non-subject extraction. Any pattern of selectional restrictions that excludes CP complementation would create a situation in which a clausal complement is acceptable only when its subject is extracted. In the domain of finite complementation, I am unaware of any languages with this property, perhaps for reasons of usability. This leaves three other possibilities, all of which are attested.

As we have already seen, long-distance extraction of the subject in French (with the embedded clause remaining finite) yields a clause introduced by the ALIQUI element *qui*, and a corresponding extraction Bùlì yields a clause introduced by *ālì*. As already noted, this is predicted if V has a selectional restriction barring TP as a post-Exfoliation complement. Likewise, for most speakers of Kreyòl, the same configuration yields a clause introduced by *ki*, suggesting the same analysis. For some Kreyòl speakers, however, the *ki* is optional under subject extraction (DeGraff 1993, 80 ex. 43, 87 fn. 34; Takahashi and Gračanin-Yuksek 2008, 226 fn. 4) — which is expected if for those speakers V has no relevant selectional restriction, permitting either ALIQUIP or TP as the output of Exfoliation under subject extraction (depending on how high the subject has raised). Dialect variation in the optionality vs. obligatoriness of *ki* is indicated by the "%" sign outside parentheses in (119b):

(119) **∅~*ki* alternation in long-distance questions (Kreyòl)**

a. Kilès Mari manse (ke) Jan renmen?
who Mari thinks that Jan likes
'Who does Mari think Jan likes?'

b. Kilès Mari panse %(ki) renmen Jan?
who Mari thinks ALIQUI likes Jan
'Who does Mari think likes Jan?'
(Takahashi and Gračanin-Yuksek 2008, 239; Michel DeGraff, p.c.)

(120) ***[V (nothing)]**

Consequences:
Long-distance subject extraction with or without ALIQUI (but no C)

Example:
Kreyòl (*some speakers*)

(121) ***[V TP]**

Consequences:
Long-distance subject extraction with ALIQUI (and no C)

Examples:
Standard and Non-Standard French (*85*) *Bùlì* (*105*) *Kreyòl* (*some speakers*)

A language in which V rejects only ALIQUIP but permits TP is a language in which subject extraction will eliminate the possibility of a complementizer —without an overt ALIQUI morpheme standing in seeming alternation with it. Standard and Belfast English have this property, as does Igbo — which differs from English, as noted by Amaechi and Georgi (2017, 2019) in requiring the complementizer to be overt in an embedded declarative clause *except* when the subject is extracted:[59]

(122) ***nà*~∅ alternation in long-distance questions (Igbo)**

a. Úchè chèrè *(nà) Òbí hụ̀rụ̀ Àdá n'-áhíá. (obligatory C; no extraction)
Uche thinks *(C) Òbí saw Ada P-market
'Uche thinks that Obi saw Ada at the market.'

b. Ònyé kà Úchè chèrè *(nà) Òbí hụ̀rụ̀ n'-áhíá. (obligatory C; object extraction)
who C (FOC) Uche thinks *(C) Obi saw P-market
'Who does Uche think that Obi saw at the market?'

---

59. Norwegian as commonly described is another example of such a language, but various dialects differ minimally in lacking the restriction in (123) and permitting subject extraction from an embedded clause introduced by the same ALIQUI morpheme *som* seen in (113) above:

a. *accepted throughout Norway*
Hvem tror du har gjort det?
who think you has done it

b. *accepted in Northern Norway, Trøndelag, and the North West coast of Norway*
Hvem tror du som har gjor det?
who think you ALIQUI has done it
'Who do you think has done it?' (Westergaard et al. 2012, 333 ex. (7a-b); Bentzen 2014, 438 ex. (7b), 439 ex. (9))

Westergaard et al. (2012) document a correlation (earlier suggested by Nordgård 1985) between the acceptability of examples like (b) and the possibility of non-verb-second order in a matrix interrogative. If this correlation is significant, it is not clear that the present proposal suggests an explanation, since it roots the possibility of (b) in a shallow selectional factor, without an obvious connection to verb-second.

c. Ònyé kà Úchè chèrè (*nà) hụ̀rụ̀ Àdá n'-áhíá. (no C; subject extraction)
who C (FOC) Uche thinks (*C) saw Ada P-market
'Who does Uche think saw Ada at the market?'

(123) ***[V ALIQUIP]**

Consequences:
Long-distance subject extraction with no ALIQUI (and no C)

Example:
Standard and Belfast English (*73*), *Igbo* (*122*)

Finally, a language that excludes both ALIQUIP and TP as complements to a predicate such as V will entirely disallow subject extraction from the area between *v*P and C, forcing the language to resort to some other strategy such as skipping. This is what we find in Standard Italian, and in the various dialects discussed above:

(124) ***[V ALIQUIP, TP]**

Consequences:
No subject extraction from position above *v*P

Example:
Standard Italian and dialects

An additional dimension of variation that should be noted here. In Bùlì, Igbo, and Veneto, the WP superstructure appears to be obligatory in questions and certain other Ā-constructions, with the result that non-subject extraction always creates an apparent violation of the Doubly Filled Comp Filter effect. This could be stated as a fact about C and W. Alternatively, for embedded constructions at least, it could be a selectional fact, if V can be said to reject CP complementation, where C is headed by a satisfied Ā-feature. For main clauses, one might imagine that a hidden higher performative verb could have the same property, but I will leave the determination of the correct proposal for future research.

3.3.6 *Homophony complexities*

A final complication — not for the theory of the phenomena discussed here, but for the analysis of specific cases (by the child acquiring these systems, as well as the linguist attempting to analyze them) — is the possibility that multiple heads in the functional sequence between *v* and C may have the same phonological realization. For example, if we assume that what look like counterparts to the pseudorelative construction in Italian and Greek have the same analysis as their counterparts in French and Bùlì, they are headed by ALIQUI post-Exfoliation. The putative ALIQUI morpheme in these languages, however, is identical to the declarative complementizer:

(125) **Pseudorelatives with ALIQUI identical to COMP**

a. Ho visto Mario che correva. *Italian*
AUX.1SG seen Mario ALIQUI (=COMP) ran
'I saw Mario run.'

b. Idha ton Yani pu etrexe. *Greek*
saw.1SG the.ACC Yani ALIQUI (=COMP) ran.PST.IPFV.3SG
'I saw Yani run.'
(*pou* otherwise introduces factive and relative clauses; Angelopoulos 2015, 1)

Similarly, Norwegian may be a language in which the exponent of ALIQUI (*som*) is identical to a specific form of C selected by the relative-clause variant of W.

(126) ***Som* in Norwegian relative clauses**

a. Vi kjenner den mannen *Op* (som) Marit snakker med. (object extraction)
We know the man SOM$_C$ Marit talks with
'We know the man that Marit is talking with.'

b. Vi kjenner den mannen *Op* *(som) snakker med Marit. (subject extraction)
We know the man SOM$_C$ talks with Marit
'We know the man that is talking with Marit.'

In Norwegian the interrogative variant of W does not select this form of C, but in Swedish it does (Taraldsen 1986, 150 ex. (7)-(10)):

(127) ***Som* in Swedish vs. Norwegian short-distance questions**

S:✓
N:* Vi vet hvem som Marit snakker med.
we know who SOM$_C$ Marit talks with
'We know who Mary is talking with'

A similar tack might be taken to explain what look at first glance to be counterexamples to the universality of complementizer-trace effects. For example, as discussed by Kandybowicz (2006, 2008), the Nupe complementizer *'án* appears to be compatible with subject extraction (with no evidence in the literature that Nupe resorts to a skipping strategy).[60] If Nupe *'án* is actually an exponent of both C and of ALIQUI, however, there is no counterexample:

(128) **Subject extraction from clause introduced by *'án* (Nupe)**

a. Zĕ Musa gàn ['án nì enyà] o?
who Musa say ALIQUI beat drum FOC
'Who did Musa say beat a drum?' (Kandybowicz 2008, 123 ex. (6b))

b. Musa gàn ['ún (<*'án*) u: nì enyà].
Musa say COMP 3SG beat drum
'Musa said that s/he beat a drum.' (Kandybowicz 2009, 338 ex. (35b))

Of course this analysis does seem a bit like cheating. One might instead suspect that the counterexample is real, and that Nupe truly lacks complementizer-trace effects, and thus poses a challenge to the universality of the factors that yield this effect in other languages. This does not appear to be the case, however, as can be seen from other facts discussed by Kandybowicz. A clause may be introduced by a more complex form *gànán*, which Kandybowicz suggests is a bimorphemic complementizer, formed from *'án* and *gàn* 'say':[61]

(129) ***gànán* as complementizer (Nupe)**

Musa gàn [gànán etsu gí eci]
Musa say COMP chief eat yam
'Musa said that the chief ate a yam' (Kandybowicz 2008, 117 ex. (1a))

60. My discussion of Nupe is entirely indebted to Kandybowicz's (2006, 2008) findings, but reorders his presentation of the facts to support a very different analysis from his, as noted below.

61. Jason Kandybowicz (personal communication) reports that *'án* and *gànán* appear to be in free variation, with no detectable difference in meaning or ability to be selected by a higher predicate.

As Kandybowicz shows, Ā-extraction of the subject from a clause introduced by *gànán* is restricted in a complex fashion. Subject extraction is possible if the clause following *gànán* is introduced by an overt present or future tense marker, by the remote-past expression *pányi lě* 'a long time ago', or by an φ-agreeing element that Kandybowicz describes as a resumptive pronoun, but not otherwise:

(130) **Subject extraction from *gànán* clause (Nupe)**

a. Zě Musa gàn [gànán ___ **è/à** nì enyà] o? *overt tense marker*
who Musa say GÀNÁN PRS/FUT beat drum FOC
'Who did Musa say is beating/will beat a drum?'

b. Zě Musa gàn [gànán **pányi lě** nì enyà] o? *remote past*
who Musa say GÀNÁN before PST beat drum FOC
'Who did Musa say that a long time ago beat a drum?'

c. Zě Musa gàn gànán **u**: má du o? *φ-agreeing element*
who Musa say GÀNÁN 3SG know cook FOC
'Who did Musa say knows how to cook?'

d. *Zě Musa gàn [gànán ___ nì enyà] o? *none of the above*
who Mus say GÀNÁN beat drum FOC
'Who did Musa say is beating/will beat a drum?'

(Kandybowicz 2008, 127 ex. (13b); 124 ex. (8b); 129 ex. (14b); 127 ex. (13a))

Significantly, if we accept Kanybowicz's identification of the boldfaced φ-agreeing element in (130c) as a resumptive pronoun, it must be restricted in this function to subject extraction, as object extraction disallows any kind of resumption (Kandybowicz 2008, 124 ex. (9d-f)) , and must be further restricted to clauses that lack the present, future, and remote-past markers of (130a) and (130b). These markers are in complementary distribution under subject extraction with the φ-agreeing element boldfaced in (130c) (*ibid*, 124 ex. (26d-e). The φ-agreeing element is also excluded under subject extraction from clauses that are introduced by the complementizer *'án,* rather than *gànán* (*ibid*, 136 ex. (c)). Kandybowicz develops a proposal under which overt tense markers, the remote past marker, and *'án* ameliorate violations of the complementizer-trace effect (for reasons to which I return shortly), and suggests that the φ-agreeing element is a spell-out of an Ā-trace inserted as a last resort only to avoid a complementizer-trace effect.

The proposals advanced here suggest another possibility. If *gànán* is bimorphemic*,* as Kandybowicz suggests, it can be imagined that *gànán* constructions are actually double-CP structures, in a manner reminiscent of our proposals for English in section 3.2 — with *gàn* heading the higher CP and *'àn* heading the lower clause. In a clause without subject extraction like (129), *'àn* undergoes head movement to *gàn.* When the subject is extracted, Exfoliation reduces the size of the lower CP, with the patterns of (130) as the result. In particular, I propose that the acceptable output of Exfoliation seen in each example of (130a-c) is TP, with ALIQUIP (and *to*P) excluded as outcomes by the selectional restrictions of the higher *gàn*-complementizer (cf. (123)).

Rather than viewing the φ-agreeing element in (130c) as a resumptive pronoun, I propose that it is an φ-agreeing form of T. On this view, it is in complementary distribution with PRS, FUT and the remote-past marker because it represents a distinct value for tense from values compatible with these elements.[62] The

62. Such sentences appear to have the characteristic semantics of unmarked tense, dubbed "factative" by Welmers and Welmers (1968), as discussed by Déchaine (1991) (cf. Stowell 1991/1996; Fitzpatrick 2006). As Banfield and Macintyre (1915, 36) and Smith (1969, 117) both note (and as confirmed by Jason Kandybowicz, personal communication) the verb in such sentences may be understood as past tense — or as present tense, when the verb is stative.

reason this element is overt only under subject extraction is the Exposure Condition. Nupe is a language without morphological marking of tense on the verb, so we are not surprised to see T following the same laws of pronunciation as other elements in the functional sequence between *v* and C.

We must then ask about the interaction of the Exposure Condition with *è* 'PRS', *à* 'FUT', as well as the remote past marker *pányi l*ĕ, which remain overt even in the absence of subject extraction. If these elements are specifiers of T, rather than instances of T itself, this behavior is expected. This is in fact Kandybowicz's own conclusion concerning the remote past marker, which obligatorily precedes the subject when it is not extracted and may follow focused constituents. Kandybowicz proposes that it is adjoined to TP:

(131) ***Pányí lĕ* adjoined to TP (Nupe)**
Ebógáo, pányí lĕ Musa (*pányí lĕ) dzò eyì.
therefore before PST Musa (before PST) plant corn
'Therefore, a long time ago, Musa planted corn.' (Kandybowicz 2008, 41 ex. (30a))

The PRS and FUT markers might be analyzed with a very similar syntax, except that they must merge below the subject (and linearize to its left), perhaps because they are bare heads, rather than phrases like the remote-past marker.

For this analysis to be correct, the free-standing verb *gàn* must be stipulated as permitting CP and ALIQUI complements, as a selectional property, as seen in (128) and (129) — but not TP complements. The version of *gàn* that attracts *'án* to form *gànán,* however, permits only CP and TP complements — and not ALIQUIP complements. These selectional properties are, of course, unexceptional in the broader typology of subject extraction patterns, as discussed in the previous section.

Finally, notice that our analysis of subject extraction from *gànán* clauses offers yet another instance of derivational opacity. The *-án* morpheme survives as a suffix on *gàn-* after its source position is deleted by Exfoliation, a point of some interest if this analysis is correct. *Gànán*, according to Kandybowicz, is used with sentential complements "whose propositional content is asserted/presupposed", while another two-part complementizer *ke...na* is reserved for clauses whose content is not asserted or presupposed (for example, the complement to 'seems'). Kandybowicz suggests that the interaction of this second complementizer with subject extraction is identical to the behavior of *gànán*, which would suggest a similar analysis in which *na* is a lower instance of C that raises to *ke* — but for some reason is linearized to the right — and survives in its higher position even when its source position has been eradicated by Exfoliation. I leave the investigation of this possibility to further research.

Kandybowicz (2006, 2008) proposes a very different account of the patterns of subject extraction in Nupe, according to which prosodic factors bear primary responsibility for the effect. He shows that the right edge of an intonational phrase boundary immediately follows *gànán*, but not *'àn*, so that whatever follows *gànán* must be the leftmost element of a new intonational phrase. Kandybowicz suggests that this element must be external to *v*P, for reasons having to do with the alignment of intonational and syntactic phrasing, but proposes that it may not be a segmentally empty element — hence the need for an overt *v*P-external element, as seen in (130a-c). The account of Kandybowicz's findings offered here, by contrast, is purely syntactic, and uses ingredients already defended in previous discussion.[63] Furthermore, the analysis

63. Kandybowicz calls the Nupe remote past marker *pányi lĕ* an adverbial, and views the amelioration of the complementizer-trace effect in examples like (130b) as a Nupe counterpart to the effects of sentential adverbs in English discussed in section 3.2 above. As Kandybowicz (p. 135, fn. 11) notes, however, *pányi lĕ* is the only element of its kind in the language, which I suspect leaves open the possibility of other analyses such as the one proposed here. Kandybowicz does note (p. 40, fn 14) that *pányi lĕ* may occur to the left of focused elements (a preferred position, in fact) and sentence-finally (where it precedes the focus marker), which might be consequences of movement on the view advanced here.

presented here suggests an account of the prosodic contrast noted by Kandybowicz between *gànán* and *'àn*: *gànán* takes a phase as its complement both before and after Exfoliation, while *àn* takes a non-phasal TP as its complement. If it is the phase boundary following *gànán* that is responsible for the prosodic break that Kandybowicz documents, the prosodic properties that correlate with differences in subject extraction can be seen as consequences, rather than causes, of the factors that yield the complementizer-trace effect in Nupe. This conclusion is of interest, as Nupe is the language for which the most detailed argument has been advanced for a prosodic account of this effect, in opposition to a purely syntactic account like that advanced here.[64]

To return to the broader point of this subsection: it is premature to give up on the universality of the factors that underlie the complementizer-trace effect in the fact of apparent counterexamples and puzzles in the languages of the world. It remains striking that even in languages where certain paradigms are problematic for the universality of the subject/non-subject asymmetries that result from the interaction of phase theory with Exfoliation, there is often some other corner of the language where exactly this kind of asymmetry pops out after all — and the theory has a place for the apparent counterexamples too. What remains a task for future work is a more precise delineation of the full set of possibilities, when repertoires of selectional options and possible homophonies interact with those aspects of the proposal advanced as universal components of the human language faculty.

The next subsection ties up one additional loose end concerning English. This discussion will be useful in succeeding sections, where we reintroduce consideration of non-finite outputs of Exfoliation.

3.4 Complementizerless clauses in English

The biconditionalized Exposure Condition (108) entails that C, like other functional heads in the clausal spine, always has a phonological exponent in principle (as stated in item (f) of the list on page 55), i.e. that there is no such thing as a lexically null variant of C. This raises the immediate question of finite complementizerless clauses without any obvious subject extraction in English — both embedded declarative clauses as in (132a-b) and so-called "contact relative clauses" (Jespersen 1949, 132 ff.) as in (133a-b):

(132) **Complementizerless embedded declarative clauses (English)**
- a. Mary concluded he should be be invited to our conference.
- b. John claims Sue spoke with Fred.

(133) **Contact relative clauses (English)**
- a. This is a person Bill knows well.
- b. This the book Sue praised to the skies on her blog.

The discussion so far provides two circumstances under which a complementizer may fail to be pronounced: (a) when deleted by Exfoliation and (b) when unpronounced due to non-exposure. I will suggest that both factors are at play in producing complementizerless embedded declarative and relative clauses like those in (132) and (133). The key to explaining such examples will be the availability of the double CP structures discussed in section 3.2 (where it was crucial to the account of adverb-intervention exceptions to the complementizer-trace effect). Despite appearances, I propose that subject extraction does take place in these constructions, as first argued for complementizerless embedded declarative clauses by Pesetsky

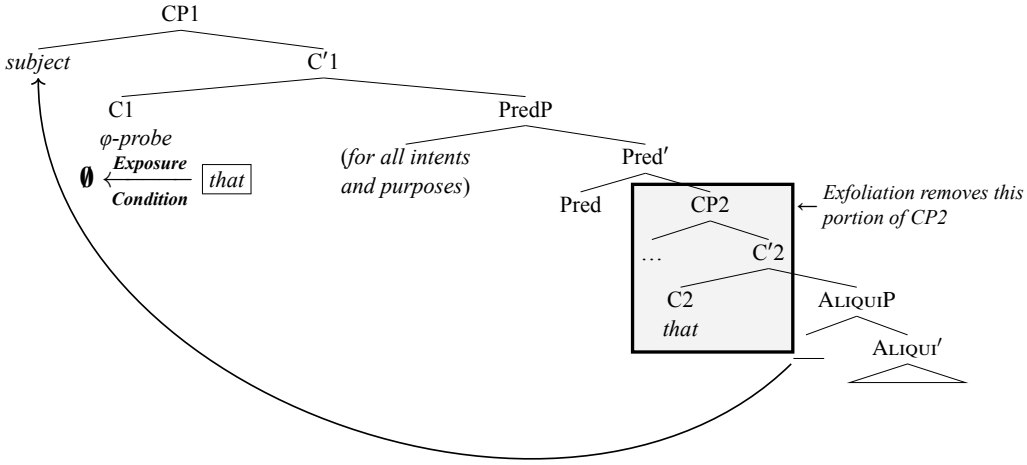
64. Kandybowicz (2006) extends his proposal beyond Nupe, suggesting that complementizer-trace effects cross-linguistically have prosodic explanations — as occasionally claimed, for example, in connection with the adverb intervention effects for English discussed in section 3.2. Ritchart et al. (2015), however, present data suggesting that prosodic factors do not play a role in these effects. See Pesetsky (2017, 11-13) for some additional discussion.

and Torrego (2001, 373 ff.) (though in the context of a different proposal concerning complementizer-trace effects). I consider complementizerless embedded declarative clauses first, and then turn to contact relatives.

3.4.1 *Complementizerless declarative clauses in English*

In section 3.2, I proposed that English C may take as its complement a null predicative phrase whose semantics are roughly "it is the case that..." — and that the head of this predicative phrase itself takes a second CP complement. Suppose now that in addition to its Ā-probe, English C also bears a φ-probe with an EPP property. This φ-probe will attract the highest nominal accessible to it, whenever conditions permit. Most of the time, however, conditions will *not* permit this φ-probe to satisfy its EPP requirement, because the nearest attractable element will occupy the specifier of the local TP, and will therefore be unattractable as an anti-locality consequence of LAAC. One place where LAAC will not prevent a φ-probe on C from satisfying its requirements is the higher C of a double-CP structure, like those discussed in section 3.2. In such a structure, if the higher clause lacks a nominal attractable by C, the φ-probe on C1 will find the subject of the lower CP (i.e. CP2) as its goal and move it to form a specifier of CP1, without running afoul of LAAC. Crucially this operation will trigger Exfoliation of CP2, eliminating the lower instance of *that*, as a standard instance of the complementizer-trace effect. Furthermore, if C1 retains its specifier (i.e. if the subject attracted by the φ-probe on C1 does not move further), the Exposure Condition will render the higher instance of *that* unpronounced (though syntactically present). The consequence will be an embedded clause with no overt complementizers at all — ironically, a straightforward and predicted consequence of a structure that started out with not one, but *two* distinct and potentially pronounceable complementizers.

(134) **Analysis of complementizerless clause (English)**



It is important to emphasize the importance to this analysis of the claim that the null predicate in these constructions lacks nominal arguments, so that the closest nominal argument to the φ-probe on C1 is indeed the subject within CP2. This is a stipulation that future research needs to confirm and explain. What is perhaps not a stipulation in the same sense is the presence of the φ-probe on C in the first place. If C bears a φ-probe, then there is an interesting uniformity to the functional heads from *v* through C: *v*, *to*, T, ALIQUI and C itself. Each one may attract the subject, and each one therefore bears a φ-probe. It is only LAAC and the special status of C as a phase-head that prevents the needs of its φ-probe from being satisfied outside the special circumstances of (134).

If this analysis for English complementizerless declaratives is correct, the subject has moved out of the CP within which it was first merged, and ends up structurally higher than when it follows an overt *that*.

Evidence from adverb positioning supports this claim. Doherty (1997) observed that an sentence-level adverbial phrase may precede the subject of an embedded clause when the adverbial immediately follows an overt *that* — but may not precede the subject when *that* is omitted (as also discussed by Grimshaw 1997 and Pesetsky and Torrego 2001):

(135) **Adverbials may not precede subject in complementizerless declarative clauses (English)**
a. She claimed [*(that) soon Mary would arrive].
b. She insisted [*(that) most of the time they accepted this solution].
(Grimshaw 1997, 411, ex. (43a))
c. Mary is claiming [*(that) for all intents and purposes John is the mayor of the city].
(Pesetsky and Torrego 2001, 375, ex. (37b))

The subject may of course precede these adverbials in a complementizerless embedded clause:

(136) **Adverbials may follow subject in complementizerless declarative clauses (English)**
a. She claimed [Mary soon would arrive].
b. She insisted [they most of the time accepted this solution].
c. Mary is claiming [John for all intents and purposes is the mayor of the city].

These findings are predicted if the subject in a complementizerless embedded declarative clause has moved to the specifier of CP1, above any position that an adverbial can occupy. This means that the adverb is itself excluded from occupying a specifier position in CP — a fact independently shown by examples like (134) (also discussed by Doherty):

(137) **Adverbial impossible as specifier of CP**
a. *She claimed [soon that Mary would arrive].
b. *She insisted [most of the time that they accepted this solution].
c. *Mary is claiming [for all intents and purposes that John is the mayor of the city]

Doherty also notes that certain adverbials may precede *that*, and these same adverbials are also acceptable when *that* is omitted:

(138) a. She says [when we get home (that) things will be different].
b. I believe [next year (that) she'll be fine].
c. I suppose [ordinarily (that) you would go somewhere else].
d. He thinks [in some circumstances (that) things would be better].
(Doherty 1997, 203, ex. (16)-(17))

This observation, if correct, is compatible with the proposal developed here, if these adverbials, unlike others, may move (or are externally Merged) so as to form a specifier of CP. When *that* is present, the adverbial is a specifier of the higher C in a double-CP structure, and the overt *that* is the lower C. When *that* is absent, the adverbial is a specifier of CP in a single-CP structure, with the C silent in accordance with the Exposure Condition.

Now recall from section 3.2 that when two complementizers are string-adjacent, the C Identity Avoidance Rule in (81) marks them with an asterisk that yields a sensation of deviance if present at PF. As discussed in that section, because the first of a pair of adjacent complementizers receives this mark the moment it is adjacent to the second complementizer, the sensation of deviance remains even when the second

complementizer has been deleted by Exfoliation. That was the reason why the end run around the complementizer-trace effect offered by such structures requires the presence of material that separates the two complementizers pre-Exfoliation.

Why do we not observe a similar adverb requirement in complementizerless sentences? Why is a structure like (134) acceptable even when the parenthesized adverbial is omitted? The very complementizerlessness of the structure provides the answer. Since neither complementizer is visible at PF (C2, because it has been eliminated by Exfoliation[65]; and C1, because it has been silenced by the Exposure Condition), the asterisk added by the C Identity Avoidance Rule yields no sensation of deviance.[66] When a subject is extracted from CP2 in a double-CP structure, and CP1 retains its specifier, the Exposure Condition silences C1 and nothing is required to intervene between the two complementizers. If the specifier of CP1 moves on, however, (as in the complementizer-trace paradigm) the Exposure Condition does not silence C1, and adverbial intervention is therefore necessary. Our proposal for complementerlizerless clauses thus causes no problems for our account of complementizer-trace effects.

I conclude the discussion of complementizerless declarative clauses with several further observations concerning the proposed analysis.

First, though I will not offer specific proposals here, the current proposal might be extended along lines earlier pursued in Pesetsky and Torrego (2001, 2007), so as to predict the restrictions on the external syntax of complementizerless clauses in English, including the fact that a complementizerless clause may not appear as the subject of a higher clause:

(139) **Complementizerless clause impossible as subject (English)**
*[The world is round] is a tragedy.
(cf. ✓[*That the world is round*] *is a tragedy.*)

Both the current proposal and Pesetsky and Torrego's proposals posit movement of the subject to a higher position in complementizerless declaratives — responding to the EPP property of a semantically uninterpretable probe with which the subject underwent the operation Agree. Pesetsky and Torrego adopt Chomsky's (1995a, 2000, 122 ff.) proposal that an instance of an uninterpretable feature that has successfully entered an Agree relation with an interpretable counterpart (cf. Pesetsky and Torrego 2007) obligatorily deletes. They then note that if the raising of the subject to a higher head H of a constituent HP triggers the deletion of the feature F on H that attracted it, the resulting absence of F on H might prevent HP itself from undergoing any movement that is crucially triggered by a higher F-probe. In particular, if subject-forming movement is triggered by a probe that searches for the very same feature that triggers raising to specifier of C1 in (134), the deletion of this feature on C1 will prevent CP from undergoing subject-forming movement. For reasons connected with their proposal for complementizer-trace effects, Pesetsky and Torrego proposed that the relevant feature is tense-related, but in the present framework, we might equally well identify it as an uninterpretable φ-feature (or φ-feature bundle.

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65. There is actually no argument supporting the addition of an asterisk to C2 in these constructions. The result would be the same if the rule were written so as to stigmatize only C1, but in the absence of deciding evidence, the formulation adopted here may be the more parsimonious option.

66. Recall that the inability to find an acceptable exponent for a morpheme later deleted by Exfoliation does produce a sensation of deviance detectable by at least some Icelandic speakers, even when that morpheme is later deleted as a by-product of Exfoliation, as discussed in section 2.6.2. In the final paragraphs of section 2.6.2, we noted that the sensation of deviance produced by non-satisfaction of EPP followed a different logic, in that deletion of the head bearing an unsatisfied EPP requirement eliminated the effects of failing to satisfy the requirement. We speculated there that the deviation attributable to not finding an exponent represents a failure of *process* (the search for an exponent failed to terminate) rather than a property of the representation rejected by PF or LF — as is arguably the case with failure to satisfy EPP. Our treatment of the problem created by adjacent complementizers places it in the same category with respect to this issue as EPP satisfaction.

Additionally, note that successive-cyclic Ā-movement of a non-subject from an embedded complementizerless clause must be permitted to create a second specifier of CP2, given the analysis in (134). McCloskey (2000) has shown that West Ulster English provides a probe into the landing sites of successive-cyclic *wh*-movement in the form of a pluralizing *all,* which may be pronounced in any intermediate CP-peripheral position where a plural single-word *wh*-phrase has stopped in the course of long-distance Ā-movement. (See footnote 50 for how this phenomenon must be analyzed in light of the Exposure Condition.) Crucially, pluralizing *all* is not only found to the left of an overt complementizer *that*, but also to the left (and not to the right) of the subject of an embedded complementizerless clause. This makes it clear that Ā-movement into the CP1 domain must form a specifier higher than that created by the A-moved subject. I will leave reasons for this open, but the observation itself will be important in the next subsection.

(140) **West Ulster *all* stranding with and without overt *that***
What did he say all (that) he wanted ___ ?
'What (pl.) did he say that he wanted?'

Finally, let us return to the topic of cross-linguistic variation, since many languages, such as French, do not allow complementizerless embedded declarative clauses. Clearly, some key ingredient of the English construction must be unavailable in such languages. One contender is the null predicate that permits the double CP structure in the first place.[67] Another is the φ-probe on C that permits the subject of CP2 to raise into CP1. Crucially, the factors that permit or disallow English-style complementizerless clauses are distinct from the selectional factors that permit or disallow a bare TP to result from Exfoliation when the subject is extracted from an embedded clause in a given language. We thus expect to find dissociations: languages in which a complementizerless finite clause is possible *only* under subject extraction, and not more generally. As already noted in the previous section and documented in example (122), Igbo is just such a language.

One complication, also relevant to the next section, is the fact that complementizerless declarative clauses in Kreyòl (assuming the same analysis as that suggested for English) require Exfoliation to TP, and not AliquiP, since *ki* does not appear following the subject. Though we should seek a deeper explanation, this can be viewed for now (at least as a stop-gap) as a selectional property of the null predicate — i.e. rejection of AliquiP as a complement, and acceptance of TP (and perhaps CP).

3.4.2 *Contact relative clauses in English*

Let us turn now to English contact relative clauses. I propose that the key to predicting the existence and properties of these complementizerless relative clauses is the choice of a particular analysis for English *non*-contact relative clauses introduced by an overt *that*:

(141) ***That*-relative clauses (English)**
a. I met a person that Bill knows well.
b. Mary wrote the book that Sue praised to the skies on her blog.

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67. If double CP structures are impossible in French, it is predicted that complementizer-trace effects in French will not be ameliorated by the intervention of adverbs as they are in English — if the amelioration effect in English relies on the double CP structure, as argued in section 3.2. This prediction is correct, as noted by Rizzi 1997, 320:

l'homme	que	je	crois	✓qui/*que,		l'annee	prochaine,	___	pourra	nous	aider
the.man	who	I	believe	✓ALIQUI/*COMP,		next	year,		will.be.able	us	to.help

'the man who I believe (that) next year will be able to help us'

In particular, if we adopt a head-raising analysis for examples like (141a-b), the same double-CP structure posited for complementizerless declarative clauses in the preceding subsection will also provide an analysis for contact relative clauses. Furthermore, this proposal also predicts the so-called "anti-*that*-trace effect" for English relative clauses — a puzzle whose analysis has bedeviled most previous proposals advanced to explain complementizer-trace effects of the non-"anti" variety.

We therefore begin with English *that*-relatives. Since the relation between the nominal head of these relative clauses and the relativization gap obeys island conditions and other characteristic properties of Ā-movement, we may assume that some element has been attracted to C in this construction (Chomsky 1977). Holding constant the (mostly uncontroversial) claim that *that* in such examples is a complementizer, the field has explored two main options concerning the identity of the moving element.

One option, which we may call the "*wh*-movement hypothesis", proposes that a *wh*-phrase moves to the specifier of C in a *that*-relative, much as an embedded question. The clause in which *wh*-movement has taken place then externally merges with the nominal head with varying proposals concerning the syntactic and semantic connection between the relative clause and the nominal head. A *wh*-relative on this view differs from a *that*-relative mainly in the overtness of the *wh*-phrase (Keyser 1975, 17-22; Chomsky 1977, 98; Chomsky and Lasnik 1977, 434 ff.).

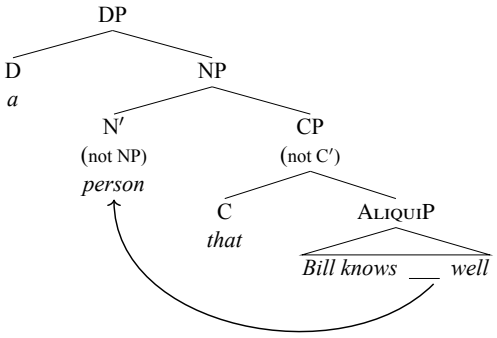
(142) ***Wh*-relative clauses (English)**

a. I met a person who Bill knows well.

b. Mary wrote the book whose plot Sue praised to the skies on her blog.

An alternative family of proposals, which I will call "the head raising hypothesis" posits that it is the head nominal itself that undergoes Ā-movement. On one simple version of this proposal, the head nominal raises to a position homologous to that targeted by overt *wh*-movement, except that it is the moved nominal that projects, rather than C, satisfying a selectional requirement of D:

(143) **Head-raising hypothesis for *that*-relatives (English)**



Åfarli (1994), Aoun and Li (2003, 110-123) and Szczegielniak (2004) (as noted by Salzmann (2017, 145)) have argued that this simple version of the head-raising hypothesis is correct for English *that*-relatives and their counterparts in certain other languages (a point to which I return below) — but incorrect for *wh*-relatives, which do involve *wh*-movement and external Merge of the nominal head. This mixed picture turns out to be supported for English by the proposals advanced here.

Of course, head-raising proposals have been advanced for *wh*-relatives as well, as well as more complicated variants for *that*-relatives. In many of these proposals, a complex constituent containing both the ultimate head nominal and a (possibly silent) *wh*-word moves to form the specifier of CP, often with

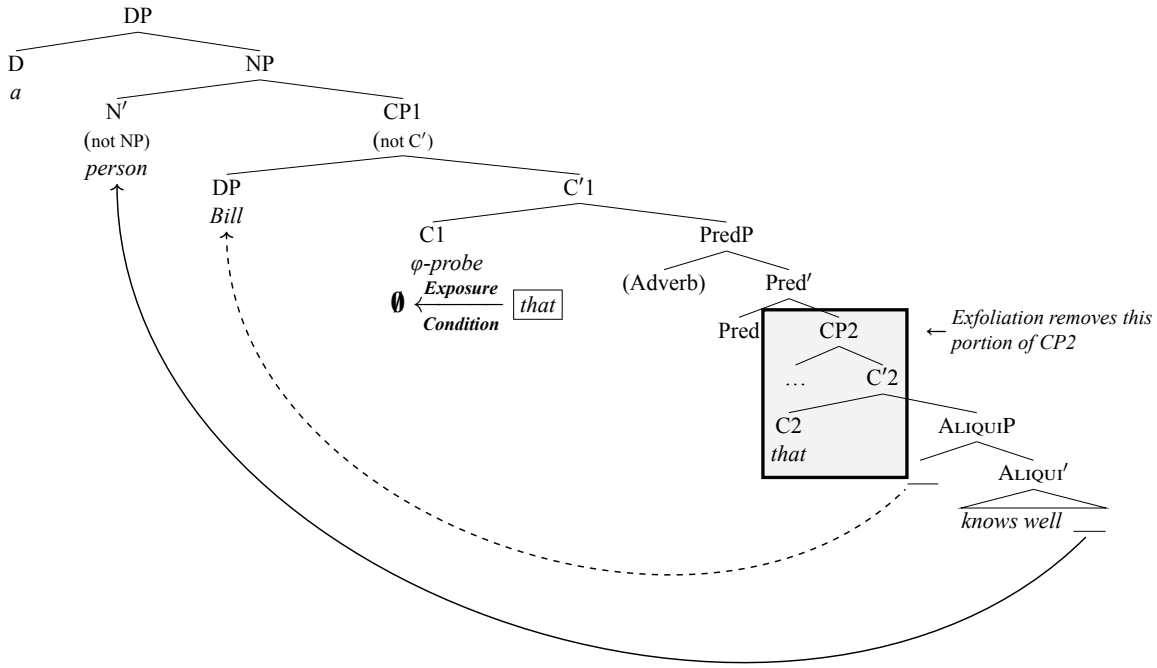
sub-extraction of the nominal forming a projecting head at a higher structural level. This is the research tradition launched by Brame (1968), Schachter (1973, 33 ff.), Vergnaud (1974), and Kayne (1994) among others — and is the family of proposals most commonly discussed under the rubric of "head raising analyses". While some variants of these proposals are probably compatible with what follows, I will not explore them here. The number of analyses that have been proposed for relative clauses (even just within English) is vast, as are the issues relevant to adjudicating among them (see Bianchi 2002 and Salzmann 2017, chapter 2 for surveys). My brief discussion of relativization overall will be incomplete and cursory, limited to a few points closely connected to preceding discussion.

The head-raising analysis interacts with the Exposure Condition and LAAC in ways that predict the salient puzzles of English *that*-relatives. First, although the movement of the relative-clause head under the analysis in (143) is triggered by features of C, just like standard instances of Ā-movement, the position to which the nominal moves ends up external to CP. Consequently, *that* counts as exposed, and is therefore pronounced. In addition, because the moved nominal is not a specifier of CP in its new position, LAAC does not block a configuration otherwise identical to (143) in which the moving element is the subject. In other words, there should be no antilocality restriction on short-distance subject complementizer relativization. This correctly predicts that the complementizer is overt, and remains overt when the local subject is relativized:

(144) **No Antilocality restriction in *that*-relativization of the local subject (English)**
   a. I met a person that knows French well.
   b. Mary wrote the book that impressed Sue so much.

Now let us turn to contact relatives. The same kind of movement that forms a *that*-relative should be able to raise a nominal to the higher CP of the double-CP structure discussed in the previous section. As noted there, McCloskey's (2000) findings concerning *all*-stranding in West Ulster English provided evidence that Ā-movement in such structures must target a specifier position higher than that occupied by the raised subject, as seen in (140). All things being equal, we expect the same to be true of the kind of Ā-movement that produces *that*-relative clauses. Once again, because the Ā-moved element projects, the moved material does not prevent C from counting as exposed. The raised subject, however, *does* protect C from exposure, just as it does in the embedded declarative clauses discussed in the previous subsection. Consequently, *that* is not pronounced, and the result is a contact relative, as seen in (145) for non-subject relativization:

(145) **Contact relative clauses (English)**



Evidence for the very high position of the subject in a contact relative can be found in the relative ordering of this subject and adverbs: the very same considerations that supported the corresponding claim for complementizerless declarative clauses in (135). As Doherty (1993/2013, 63) observed, an adverbial internal to a contact relative clause may not precede the subject. This behavior contrasts with *that*-relatives, where the same adverbials may precede the subject and follow the complementizer:

(146) **Adverbials may not precede subject in contact relative clauses (English)**

a. I met a person *(that) apparently Bill knows well.
b. Mary wrote the book *(that) recently Sue praised to the skies on her blog.
c. They live in the city *(that) for all intents and purposes John is the mayor of.

Once again, these adverbs may follow the subject in a contact relative (so we can be sure that they are not excluded in general):[68]

(147) **Adverbials may follow subject in contact relative clauses (English)**

a. I met a person Bill apparently knows well
b. Mary wrote the book Sue recently praised to the skies on her blog.
c. They live in the city John for all intents and purposes is the mayor of.

Now let us consider what is predicted by this proposal concerning the relativization of the local subject in a contact relative. If the subject has raised from CP2 to form a specifier of CP1 but has not projected, C1 is not exposed, and will therefore be unpronounced, as we have seen. At the same time, that is not a derivation in which the raised subject can function as the head of a relative clause, precisely because it did not project. As we have just seen, if a non-subject undergoes Ā-movement triggered by C1 and then projects, the result is a contact relative structure like (145). There is no way, however, for a raised

68. These adverbs may follow the subject even in a *that*-relative as well (*the person that Mary apparently knows well, etc.*). This is not a surprise, since as far as I know there is no adverb in English that is required to precede the subject in any construction. I leave the reasons for this, and the broader laws governing adverb placement, for future work.

subject in a double CP structure to head a contact relative itself — assuming that English requires the moved nominal to project in head-raising relative clauses. For that to be possible, it would need to count simultaneously as a retained specifier of C1 (so *that* will be unpronounced) and as a projecting phrase external to CP1 (satisfying the requirement imposed on English relative clauses) — a contradiction. If the raised subject were permitted to merge for a second time to CP1, it could project — but then CP1 will not have retained its specifier, leaving *that* exposed and therefore pronounced. Furthermore, even if we were to redefine the notion of specifier retention to permit *that* to count as unexposed in this configuration, it has been argued by Abels (2003, 91-113) Ko (2007, 62 ff.; 2014, 21 ff.), and others on independent grounds that a head does not license movement of its own specifier. We therefore conclude that there can be no relative clause in which the subject both protects the highest complementizer from exposure and projects as the head of the relative. Consequently, a subject contact relative should be impossible in English, a correct prediction for standard varieties:

(148) **Subject contact relatives (English)**

a. *I met a person knows French well.

b. *Mary wrote the book impressed Sue so much.

The fact that the usually optional *that* becomes obligatory in English when the highest subject is relativized is a mirror image of the complementizer-trace effect, and has proved to be a thorn in the side of most analyses of that effect (e.g. Pesetsky 1982a, 305 ff., Chomsky 1981, 245-246, and Pesetsky and Torrego 2001, 411 fn 38, among many others). If the head raising analysis just discussed is correct for English, however, this "anti-*that*-trace effect" follows in its entirety from the same considerations that yield the *that*-trace itself and its cross-linguistic congeners, and needs no special explanation. The English anti-*that*-trace effect looks exotic in the present context only insofar as it is the first construction considered here in which the moved element projects.

We should now, however, be puzzled by the existence of languages whose complementizer-introduced relative clauses show a complementizer-trace effect, rather than an anti-complementizer-trace effect. In French and Kreyòl, for example, the left periphery of corresponding relative clauses looks just like a clause from which long distance extraction has taken place. In French, relativization of the local subject triggers Exfoliation, yielding a clause obligatorily introduced by *qui* (i.e. by ALIQUI), while relativization of any lower element yields a relative clause obligatorily introduced by *que* (i.e. by C). As noted above, French lacks the double-CP option that yields complementizerless declarative clauses. Consequently there are no instances of long-distance extraction from complementizerless declarative clauses, and correspondingly, there are no contact relatives:

(149) **Relativization of lower nominal vs. local subject (French)**

a. une personne [*(que) Marie a invité ___] *lower nominal*
   a person COMP Marie AUX invited.PTCP
   'a person who Mary invited'

b. une personne [*(qui) connaît bien le français] *local subject*
   a person ALIQUI knows well the French
   'a person who knows French well'

Kreyòl behaves like French plus the additional possibility of contact relatives. As noted in the previous subsection, it differs from French in permitting complementizerless declarative clauses, and extraction

from a complementizerless clauses is possible. Correspondingly, Kreyòl does show contact relatives in addition to non-subject relatives introduced by a complementizer.[69]

(150) **Relativization of lower nominal vs. local subject (Kreyòl)**

a. Annou vote pou kandida [(ke) nou vle ___] a. *lower nominal*
let's vote for candidate we want DEF
'Let's vote for the candidate we want.'

b. Moun [*(ki) pa travay p ap touche]. *local subject*
people ALIQUI NEG work NEG FUT get.paid
'People who don't work won't get paid.' (DeGraff 2007, 110 ex. 58, 55))

The behavior of these French and Kreyòl relative clauses suggests that the nominal head is indeed extracted from its clause by an external probe, in contrast to their English counterparts.[70] One possible trigger for this movement might be a feature on D itself, which could satisfy by internal Merge the same selectional requirement for an NP that English D satisfies by external Merge (of the relative clause in which the moved nominal projects). One version of this analysis might posit distinct *d* and D heads analogous to *v* and V (with *d* moving to D to place the actual determiner outside both the NP and its relative clause), as shown in (151) for Kreyòl. French may be analyzed the same way, except that the possibility in (151c) is unavailable:

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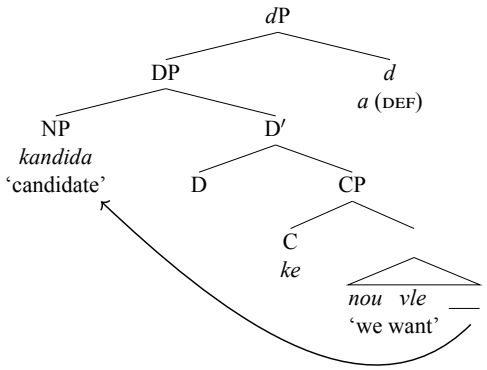
69. The possibility of overt complementizer *ke* introducing a relative clause is not discussed in linguistic literature, as far as I can tell — and is apparently stigmatized as a French-ism, like the use of *ke* in declaratives. As Michel DeGraff (personal communication) notes, however, actual usage differs, examples of relative clauses introduced by *ke* are common in speech and widely attested on the internet, even in seemingly informal contexts. Fattier 1998, 863 likewise observes that what she calls "le pronom relatif objet" (presumably *ke*) "is not always deleted in basilectal [Kreyòl], contrary to what is written in most descriptions" (translation mine).

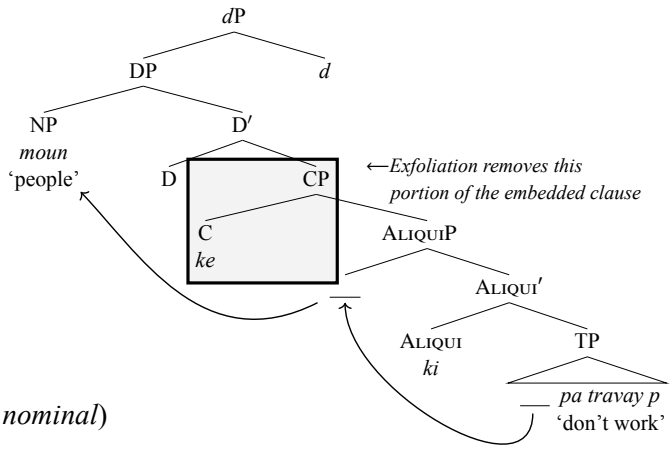
70. Other possible analyses of relative clauses of the Kreyòl/French type can be envisioned consistent with our overall picture, which I will not explore here. For example, in the spirit of original formulations of the Doubly Filled Comp filter, one might posit movement of a silent *wh*-phrase to the specifier of CP, rather than raising of the nominal head — with the notion "retaining a specifier" reformulated so that a null specifier of CP does not count as retained.

(151) **Relative clause types (Kreyòl)**

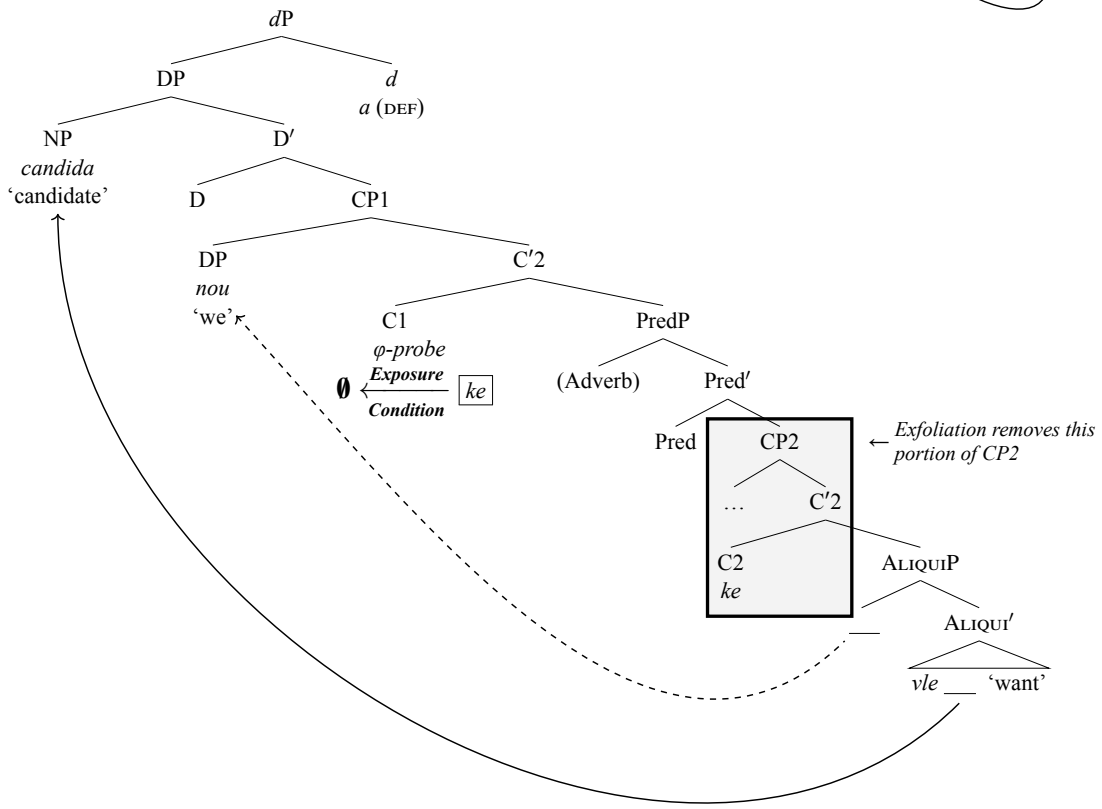
a. *Relativization of a lower nominal*



b. *Relativization of the local subject*



c. *Contact relative* (*relativization of a lower nominal*)



Note that if a language whose relative clauses are formed as in Kreyòl and French permits Exfoliation down to the TP level, eliminating ALIQUIP as well as CP, it may appear to permit contact relative clauses when the local subject is relativized. Candidates for such a construction are widely attested in non-standard dialects of English, including Belfast English (Henry 1995, 124-135) and African American Vernacular English (AAVE; see Green 2002, 90 and Sistrunk 2012), exemplified in the following examples:

(152) **Contact relative clauses with local subject extraction (AAVE)**

a. You the one [come telling me it's hot]. I can't believe you got your coat on.
'You're the one who had the nerve to tell me that it's hot…'

b. We got one girl [be here every night].
'There is one girl who is usually here every night' (Green 2002, 90 ex. (24f,j))

The analysis of this construction is, however, a topic of some controversy, including whether it is perhaps restricted to copular and existential sentences (where it is the most common), and even whether it is a true example of clausal subordination. (See McCoy 2016 for a general survey of the issues.) If a contact relative is a true option for relativization of the local subject in English dialects, one might propose that these dialects permit both the structures described for English and the structures described for French and Kreyòl, with Exfoliation exposing T, rather than ALIQUI.

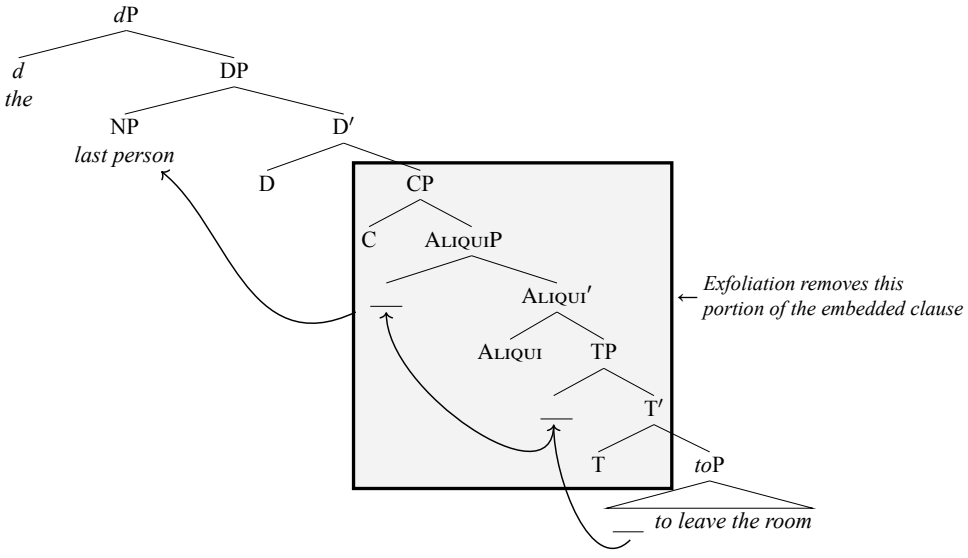
What if Exfoliation were permitted to eliminate TP in addition to ALIQUI and C under extraction of the local subject in a Kreyòl/French configuration like (151b)? The result should be an infinitival relative clause limited to local subject extraction. As has been often noted, one particular reading for infinitival relative clauses in English has exactly this property. When a position other than the local subject is relativized, an English infinitival relative clause obligatorily receives a modalized, often irrealis reading, a topic to which we return in chapter 5. When the local subject is relativized, however, a non-modalized realis reading is also available, so long as uniqueness of a particular sort is asserted of the nominal with a lexical item such as *only* or a superlative adjective (Kjellmer 1975; Bhatt 1999, 42 ff.; Pesetsky and Torrego 2001, 398 ff.):

(153) a. We invited the only person to have written a dissertation in less than four years.
vs. ...**We read the only dissertation to write ___ in two years.*

b. The last person to interview Mary gave her a good recommendation.
vs. ...**The last person to interview ___ received a good recommendation.*

The uniqueness restriction remains an open puzzle that the present discussion does not illuminate. The restriction to the local subject, however, immediately suggests the possibility that even standard varieties of English may permit a Kreyòl/French-type relative clause, so long as the complement to D is a *to*P. Because D will only acquire a *to*P complement as the result of Exfoliation, the availability of this kind of (essentially) contact relative will be limited to environments of local subject relativization:

(154) **Relativization of the local subject yielding a non-modalized infinitival relative (English)**



Finally, relative clauses with overtly moved *wh*-phrases or relative pronouns in English, French, and Kreyòl behave, unsurprisingly, just like other clause-types with retained specifiers of CP in the language.

The moved *wh*-phrase or relative pronoun is linked to the nominal head in one of the various ways that have been proposed in the literature — such as application of a predicate modification rule to the relative clause (Heim and Kratzer 1998, 86 ff.) and an externally merged NP, or alternatively to the result of subextracting the nominal head from the *wh*-phrase itself (Kayne 1994, 86 ff.; Bianchi 2011, 71 ff.; among others). In many languages, the *wh*-option is often available only to PPs and oblique nominals, especially in restrictive relative clauses[71] — but where available, the syntax of *wh*-relatives appears to be the syntax familiar from questions. For example, to the extent that French speakers permit a nominal *wh*-phrase to introduce a non-restrictive relative clause (Kayne 1977, 270, ex. (73)-(74); Sportiche 2011, 91, ex. (17)), non-standard varieties that permit *wh* + complementizer sequences in questions show the familiar *que/qui* contrast:

(155) **Relative clauses with WP (Non-standard French)**

a. la voisine de ces hommes, laquelle ?(que) j'ai rencontrée hier… *lower nominal*
the neighbor of these men, REL COMP I AUX met yesterday…

b. la voisine de ces hommes, laquelle (qui) avait dit que… *local subject*
the neighbor of these men, REL ALIQUI AUX said that…

(François Beauséjour, personal communication via Jillian Mills)

There are many further issues to be resolved concerning relative clauses, which I will not deal with here (for lack of expertise). The limited goal of this section has been the demonstration that the anti-*that*-trace effect found in English is in fact predicted by one plausible analysis of English *that*-relatives, and that a family of similarly plausible analyses can predict the absence of such an effect in Kreyòl and French. Much work remains to be done, however, before concluding that these proposals fit smoothly into a broader analysis of relativization in these languages and beyond.

71. This is the transparently the case in French (Kayne 1977, 257-259) and Kreyòl (Koopman 1982a, 176; DeGraff 2007, 121, §17.9), and arguably (though less obviously) in Dutch and English as well (Pesetsky and Torrego 2006, 17 ff.) — in addition to unrelated languages such as Yucatec Maya (Gutiérrez-Bravo and Monforte 2011, 7-8).

Chapter 4

Finiteness and extraction: some issues

The central empirical claims of the Exfoliation theory of clause size can be summarized with two slogans:

(a) Extracting the subject shrinks the clause it is extracted from.
(b) Only subject extraction can produce a smaller-than-full clause.

As we have seen, these claims allow us to pursue a unified answer to two sets of research questions that might otherwise appear to be independent:

- What explains the special internal and external syntax of infinitival clauses, and why do such clauses exist in the first place?
- What accounts for complementizer-trace effects and allied phenomena cross-linguistically?

The first set of questions concerns scenarios in which the subject of an embedded clause has raised only as far as *to*P, while the second second set of questions concerns scenarios in which it has raised higher —but in both scenarios it has been extracted from its clause in response to a higher probe, triggering Exfoliation of just enough clausal layers to place the goal at the edge of the resulting structure.

The question of which clausal layers are lost and which are preserved when a subject is extracted from a complement clause is a matter on which languages differ, reflecting the selectional properties of the head that selects that clause. A stronger theory than ours might link variation in selectional properties to other properties of the individual languages, but that is not a result we can produce at present. We have, however, seen how the *logic* of selection predicts a range of variation in complementizer-trace phenomena that may be representative — or at least constitutes a first step towards correctly modeling the full range of cross-linguistic variation. Note that if the subject remains as the specifier of *v*P, however, and is extracted from its clause directly from that position (as in the "skipping" strategy for Ā-extraction of the subject available to languages like Italian, discussed above), the structural description of Exfoliation is not met, so the clause will not be reduced. Consequently, the output of Exfoliation always preserves one or more *v*P-external functional layers, their identity regulated by selection — a substantive restriction on variation that may match reality.

The previous chapter also provided a list of the elements that head these layers*: to*, T, Aliqui, and C. This list will remain our working hypothesis, to keep further discussion manageable. If this roster should prove incomplete, the result will simply be a larger set of possibilities for clause shrinkage motivated by subject extraction — and a correspondingly wider range of selectional options for higher heads.

4.1 Anti-agreement

The phenomenon dubbed *anti-agreement* by Ouhalla (1993) may point in this direction. In many unrelated languages, from Berber dialects to Bantu, apparent short-distance Ā-movement of the subject results in the obligatory loss of φ-featural agreement morphology from the highest verb — while tense, mood and aspect morphology is retained. The examples in (156) illustrate this for Tamazight Berber. Person, number, and gender agreement between the verb and the subject, otherwise obligatory, disappears under short-distance Ā-extraction, resulting in a verb form traditionally labeled "participial", a phenomenon also observed in relative clauses and clefts. When a non-subject is extracted, full agreement remains obligatory:

(156) **Anti-agreement (Tamazight Berber)**

a. thamttut thʕla araw
woman 3SG.F.see.PRF boys
'The woman saw the boys' (VSO also possible)

b. mani thamttut ag ʕlan araw (anti-agreement)
which woman AY see.PRF.PTCP boys
'Which woman saw the boys'

c. *mani thamttut ag thʕla araw (*full agreement)
which woman AY 3SG.F.see.PRF boys
'Which woman saw the boys?' (Ouali 2006, 5, ex. (10)-(12))

In other dialects of Berber, some but not all φ-featural agreement morphology disappears under short-distance Ā-extraction of the subject. As Ouhala notes: "in some varieties [of Berber], e.g. Tarifit...the participle does not inflect for any agreement features. In other varieties, e.g. Tamazight, it inflects for NUMBER. In a third group of varieties, e.g. Ouargli and Tahaggat...the participle inflects for both NUMBER and GENDER" (Ouhalla, 2005, 665 fn. 5). A survey of 63 languages from 19 distinct families by Baier (2018) suggests that the pattern of variation found across Berber holds cross-linguistically. In some languages, PERSON is omitted under subject extraction, while NUMBER and GENDER are retained. In others, PERSON and GENDER are omitted, while NUMBER is retained. No other patterns were found in Baier's study.

The proposals advanced here immediately suggest an analysis. Let us suppose (in common with most recent work) that φ-featural agreement morphology may reflect agreement processes that involve distinct NUMBER, GENDER, and PERSON heads. Now suppose that these heads are merged in accordance with a universal ordering (from lowest to highest): NUMBER < GENDER < PERSON. Anti-agreement can now be understood as the consequence of obligatory Exfoliation under subject extraction in a clause that is the complement of W. The Berber morpheme glossed as AY above (the default form of *ag*) and as COMP in the literature, can now be analyzed as W.[72] The selectional properties of W in individual languages will determine which of these elements may head its complement post-Exfoliation — but since Exfoliation of a lower clausal layer entails the elimination of all higher layers, Baier's hierarchy is respected.

On this view, the term "anti-agreement" becomes a bit of a misnomer. If Baier's findings are incorporated into the framework developed here, the functional sequence (Starke 2001) within the clause above *v*P consists of the following heads: *to* < NUMBER < GENDER < PERSON < T < ALIQUI < C. In our discussion of *wager*-class verbs and the Kayne paradigm, we observed Ā-extraction of the subject triggering "deep"

72. Since W retains a specifier, it should not be overt, all things being equal, since it is not exposed. Ouhalla (1988, 254) describes AY in Tarafit Berber as "affixal", unable to define its own stress domain, and attracting object clitics to it whenever possible (though see Ouali 2011, 178 fn. 2 for a complication). Much as I tentatively suggested that the affixal properties of T might be responsible for its pronunciation even in the presence of a retained specifier, a similar proposal might be entertained for Berber AY, if the properties identified for Tarafit hold for their cognates in other dialects.

Exfoliation down to the *to*P layer. In our discussion of complementizer-trace effects, we saw Ā-extraction of the subject triggering shallower instances of Exfoliation that left behind the AliquiP and TP layers. If this section's conjecture concerning anti-agreement is correct, it represents an instance of Exfoliation intermediate in depth between the two sets of cases examined earlier in this work, not a special phenomenon in its own right.

I will leave this proposal as a conjecture here, and will not explore it further or compare it to alternative accounts. The phenomena that have been grouped under the rubric of anti-agreement are complex, and there are lively current debates concerning the correct analysis that I will not attempt to discuss here (e.g. Baier 2018, who argues that the claimed link between anti-agreement and movement of the subject is illusory, in light of comparable phenomena involving direct objects).

4.2 Short-distance Ā-extraction leaving a clause non-finite

If short-distance Ā-extraction of the subject accompanied by Exfoliation may leave in its wake an AliquiP or TP, and perhaps also a NumberP, GenderP, or PersonP, the question naturally arises: why not *to*P? This is not an option in English interrogatives:

(157) **Short-distance extraction of the subject leaving *to*P behind**
a. *Which student to see Mary?
b. *I was curious how many packages to arrive each day.

Common accounts of this fact attribute the impossibility of short-distance subject extraction in such examples to a case-licensing problem. These accounts, of course, presuppose a lexicalist view of non-finite clauses that permits the subject of a non-finite clause to be identified as a position to which case is not assigned. Section 2.5, however, provided numerous arguments against this proposal. In section 2.5.2, the Kayne paradigm provided a particularly explicit argument against the claim that Ā-movement from the subject position of an infinitival clause poses a special case-licensing problem — since *long*-distance movement from this position is acceptable whenever selectional properties of the higher predicate do not interfere. No detectable case-theoretic obstacle stands in the way of this movement. (See our discussion of examples (46) and (47).) The problem with examples like (157a-b) must therefore involve some factor particular to *short*-distance Ā-movement of the subject in English. The obvious culprit is W, which we have already argued selects TP but rejects CP and AliquiP as its complement. Add *to*P to that list, and the contrast between short-distance and long-distance subject extraction is correctly predicted by the theory:

(158) **Selectional property (Standard English and …)**
*[W {AliquiP, CP, *to*P}]

At the same, however, there might be cause for concern. The contrast between short- and long-distance subject extraction from *to*P argues against subsuming (157) under the broader umbrella of case-licensing theory. Attributing the contrast to the selectional properties of W in English, however, suggests that this contrast will turn out to be language-specific, like the other differences attributable to selection that have been discussed. At the moment, however, though we have seen many examples of short-distance subject extraction limited to reduced clauses, I am unaware of a language in which this clause can be maximally reduced to *to*P. If no language exists that permits this option, we must worry about a purely selectional account of (157), unless we can provide some reason why W should reject *to*P complementation universally.

A similar question arises in connection with our discussion of English complementizerless embedded clauses in section 3.4, where what looks on the surface like a simple complementizerless finite clause was argued to actually represent a double-CP configuration in which the higher C attracts the subject of the

embedded CP from the specifier of TP position, as an instance of A-movement — triggering Exfoliation that leaves the embedded clause finite but complementizerless. Can the subject also be attracted in this configuration directly from the specifier of *to*P? If so, the result would look like an R2 construction, except that tests should show the subject remaining within the embedded clause. Branigan (1992, 60 ff.) and Lasnik (2003), among others, have argued that such cases exist in English. Lasnik, for example, argued that when the verb-particle idiom *make+out* takes an infinitival complement, true R2 is found only when the subject of the embedded clause precedes the particle as in (159a). When the subject of the embedded clause follows the particle, as in (159b), Lasnik suggests that it remains in the embedded clause:

(159) a. The mathematician made every even number out to not be the sum of two primes. (cf. (10))
b. The mathematician made out every even number to not be the sum of two primes.

His principal argument relies on the claim that only the alternant in (159b) permits *every even number* to scope under negation in the embedded clause. On the assumption that only this alternant has an analysis in which *every even number* remains within the embedded clause, that negation takes that clause as its scope domain, and that reconstruction from the R2 position is impossible, the conclusion follows. If it is correct, this kind of construction might instantiate a double-CP configuration in which the higher C attracts the embedded subject and ends up taking *to*P as its complement post-Exfoliation. Because the judgments are murky and the necessary background assumptions complex (especially the ban on reconstruction; see also Iatridou and Sichel 2011), I will leave the matter open. An additional complication arises from the fact that if English C does tolerate *to*P as its complement after Exfoliation, we do not expect the construction to be limited to environments in which the higher predicate bears an R2 probe. We might imagine limiting the availability of the construction in some fashion, but the fact that we do not find R2-mimicking constructions as complements to unaccusative or passive verbs suggests that this is the wrong approach, and that constructions that look like R2 truly must be R2. In that case, English C must have a selectional property that prevents its complement from being a *to*P, and data such as Lasnik's, if correct, must be accorded some different account:

(160) **Selectional property (Standard English and …)**
*[C *toP*]

This conclusion once again leaves open the question of whether other languages might show the possibility that English lacks. R2-like constructions in which the raised element remains in the embedded clause have been argued for in a number of languages, including Passamaquoddy (Bruening 2001) and Tsez (Polinsky and Potsdam 2001), which may instantiate this possibility or something similar.

4.3 Hyperraising

Sections 2.5, 3, and 3.3 dealt with subject extraction from the specifier of ALIQUIP or TP, which triggers an application of Exfoliation that leaves the embedded clause finite — but this discussion was limited to Ā-movement of the subject and the classic paradigm of complementizer-trace effects. Does R1 or R2 movement ever participate in the same paradigm? For example, do we ever find the subject extracted to form a specifier of V or *v* (with A-movement properties) from a clause that remains finite, but crucially must lack a complementizer? That is, do we find what has been called "hyperraising" (Ura 1994) with a complementizer-trace effect?

At least three languages have been reported that appear to instantiate this possibility. One is Lusaamia, as described by Carstens and Diercks (2009). In this language, the complementizer *koti* introduces the clausal complement of a verb such as 'appear' when R1 does not occur, as illustrated in (161a) below —

but is obligatorily absent when the subject undergoes R1 movement, as illustrated in (161b). Crucially, the embedded clause remains finite and shows subject agreement. The scenario described below was devised by Carstens and Diercks to test for true R1 (as opposed to copy raising, which does not involve movement, and here yields the contextually inappropriate reading noted below):

(161) **Raising requires Exfoliation: Lusaamia (Bantu, Kenya/Uganda)**
Scenario: You find that the watering hole is empty. Though there are no cows on site, you can say:

a. Bi-bonekhana **koti** eng'ombe chi-ng'were amachi. *no R1*
8SA-appear COMP 10cow 10SA-drink 6water
'It appears that the cows drank the water.'

b. Eng'ombe chi-bonekhana (#**koti**) chi-ng'were amachi. *R1 entails *C*
10cow 10SA-appear (#COMP) 10SA-drink 6water
(without *koti*) 'The cows appear to have drunk the water.'
(with *koti*) '#The cows appear as if they drank the water' [inappropriate in context provided]
(Carstens and Diercks 2009, 103, ex. (10a-b),(11a))

Carstens and Diercks (p. 109) propose that the embedded clause in the R1 version of (161b) is a bare TP. This is just what we expect as a consequence of Exfoliation — if R1 in this language can attract a subject from the specifier of TP, leaving behind a clause that remains finite after Exfoliation.

A second language that appears to show hyperraising with a complementizer-trace effect is the Kordofanian language Moro, as explored by Jenks and Rose (2017). Though they do not offer a non-raising minimal pair, examples like (162a) exhibit the acceptable use of the complementizer *ṯá* in a non-raising environment. By contrast, examples (162b-d) show that R1 from a fully finite clause is possible, but incompatible with an overt complementizer. The use of idiomatic expressions for "it rains" and "fire the gun" (here passivized) helps ensure that this is genuine R1:

(162) **Complementizer-trace effect with hyper-R1 (Moro, Kordofanian)**

a. é-g-a-lə́ŋéṯ-a [ṯá Kúkːu kʌ́-g-ʌ-ṯunḏ-ú] *no R1* (*shows* COMP)
1SG-CLg-RTC-know-IPFV COMP1 Kuku PST-CL-RTC-cough-PFV
'I know that Kuku had coughed.'

b. kúkːu g-a-rə́mə́ṯ-iə [(*tá̱) g-**é**-↓ʧəð-á ugi] *R1 entails *C*
Kuku CLg-RTC-continue-IPFV COMP1 CLg-**DPC1**-chop CLj.tree
'Kuku kept chopping the tree.'

c. ŋaẃ ŋ–a-rə́mə́ṯ-iə [(*tá̱) ŋ-**é**-↓ḏə́n-éə]
CLŋ.water CLŋ-RTC-continue-IPFV COMP1 CLŋ-**DPC1**-rain-IPFV
'It keeps on raining.'

d. ísːíə j-a-rəmə́ṯ́-iə [(*tá̱) j-í-p-ə́n-íə
CLj.gun CLj-RTC-continue-IPFV COMP1 CLj-DPC1-beat-PASS-IPFV
'The gun kept being fired.' (lit. '…being hit')
(Jenks and Rose 2017, 214-216, ex. (14b),(16a),(18a),(19a))

In the examples above, the gloss DPC1 ('dependent clause 1') indicates a so-called *clause vowel*, also used when relativizing the local subject. RTC ('root clause') indicates a clause vowel used in finite root clauses with no extraction.The fact that the DPC1 clause vowel is used with both subject relativization and R1 provides further evidence for a unified theory of clause size that covers both A and Ā-extraction of the subject. The DPC1 clause vowel might be an instance of ALIQUI exposed by Exfoliation of the C layer, i.e.

a Moro counterpart to Bùlì *ālì*, Kreyòl *ki*, and French *qui* (though of course further investigation would be necessary to test this conjecture). Indeed, the same morphology and the same complementizer-trace effect characterize a Moro construction arguably analogous to either R2 or the pseudo-relative constructions seen in (104) above, as discussed by Jenks (2016):

(163) **Complementizer-trace effect with hyper-R2/pseudo-relativization (Moro)**

a. oraŋ́ g-a-nː-ó kúkːu-ŋ [(*tą́) g-é-lanḏ-ó ɜwúr]
CLg.man CLg-RTC-hear-PFV Kuku-ACC COMP1 CLg-**DPC1**-close-PFV CLj.door
'The man heard Kuku close the door.'

b. é-g-a-nː-á ŋaẃ [(*tą́) ŋ-**é**-↓ḏən-éə]
1SG-CLg-RTC-hear-IPFV CLŋ.water COMP CLŋ-**DPC1**-rain-IPFV
'I hear it raining.'

c. é-g-a-nː-á ísːíə [(*tą́) j-í-bug-ɔ́n-íə]
1SG-CLg-RTC-hear-PFV CLj.gun COMP CLj-DPC1-beat-PASS-IPFV
'I heard the gun be fired.' (lit. '…be hit')

(Jenks and Rose 2017, 215-216, ex. (16b),(18b),(19b))

The third language that has been described as permitting hyperraising crucially blocked by an overt complementizer is, perhaps surprisingly, English — more precisely, the English of certain speakers in a specific syntactic context. Before discussing this finding, however, we must come to grips with the fact that in English and many other languages, R1 and R2 constructions generally ban hyperraising:

(164) a. *Mary seems [___ has solved the problem]. *hyper-R1*
b. *Mary proved Sue conclusively [___ deserves the prize]. *hyper-R2*

Sadly, I will not be able to offer any actual explanation for the ban on hyperraising illustrated by examples like (164). I will, however, suggest that there is a logic to the ban that (even in the absence of an explanation) makes sense of the observation by Danckaert and Haegeman (2017) that a small corner of English permits hyperraising for some speakers. What will be exciting about this corner of English, in the context of the discussion above, is the fact that it reveals a complementizer-trace restriction on hyperraising like that observed above in Lusaamia and Moro.

Early approaches to the general impossibility of hyperraising in English assumed that the ban is universal. Rooted as these approaches were in the standard lexicalist approach to clause size, they attributed the ban to the "last resort" property of movement discussed briefly in section 2.1. These proposals relied on Vergnaud's claim that finite and nonfinite clauses differ in their ability to case-license a nominal subject, a claim that presupposed the lexicalist approach to the finite/infinitival distinction that we have argued against throughout the present work:

(165) **A-movement as a last resort (***background assumption: lexicalist*)
A-movement of a nominal (including R1 or R2 movement) is possible only if failure to move would leave the nominal unlicensed. (=15)

One of our earlier arguments against Vergnaud's claim concerning the subject of infinitives extends rather directly to argue against a last-resort account of the ban on hyperraising. In section 2.5.1, for example, we saw that clausal subjects, subjects in locative-inversion and predicate-inversion constructions, and expletive subjects in R1 and R2 environments show exactly the same correlation between raising and non-finiteness as nominal subjects — despite the absence of independently demonstrable case needs on the part of these non-nominal elements. This uniformity of behavior extends to the ban on hyperraising

seen in (164). Once again, there is no correlation between the laws governing raising and independently demonstrable case properties of the subject:

(166) **Ban on hyperraising extends to elements that do not need case-licensing (English)**
a. *[That the world is round] seems [___ is a tragedy].
b. *[In this room] are likely [___ are found the finest examples of Athenian sculpture].
c. *[Even more important than linguistics] appears [___ is the fate of the planet].
d. *There appears [___ is a riot in progress].

We might take the fact that the ban on hyperraising is not universal to suggest instead that it reflects language-particular selectional properties interacting with the aftermath of extraction-triggered Exfoliation. For example, if we propose that R1 and R2 predicates do not select for TP (or AliquiP) complementation post-Exfoliation, hyperraising will be blocked:

(167) **Possible selectional property (English and …) [replaced by (172) below]**
*[{unaccusative, R2 predicate} {AliquiP, TP}]

Note that English complementizerless declarative clauses, which may serve as a complement to the higher predicates under discussion, do not pose a problem for proposals that restrict AliquiP and TP complementation — if they are actually double-CP structures rather than smaller-than-CP clauses, as argued in section 3.4.1. The higher predicate takes the higher CP as its complement, and thus does not run afoul of the selectional properties of the predicate itself. If we assume that the lower CP is not a complement of a predicate that falls under (167), it will pose no problem either when it is exfoliated to TP or AliquiP:

(168) **Complementizerless clause as complement to R1 or R2 predicate**
a. It seemed [the world was particularly round] that day.
b. Mary believes [the world is round].

Other observations, however, do pose seemingly insuperable difficulties for such an approach. Though hyperraising A-movement is correctly blocked by (167), Ā-extraction of the subject from a clause that remains finite is also predicted to be blocked in the same contexts — a problematic prediction. In particular, consider the consequences of Ā-movement of the embedded subject in an English R1 environment where the matrix subject is expletive *it* (because the embedded subject has not undergone R1 movement). I use the diamond diacritic to indicate that I reserve discussion of the acceptability of (169a-c) for the text that follows:

(169) a. ◊Who does it seem [___ wouldn't bother wearing gloves]?
b. ◊Who is it likely [___ will forget the beer]? (Haiman 1974, 79, ex. (12)-(13))
c. ◊These students, who it was rarely believed [___ had understood anything]…

Interestingly, these examples do not merely violate the proposed selectional property in (167). They also violate the Economy condition in (56), repeated below. Recall that this Economy condition was crucial to the exclusion of structures that are identical to (169a-c), except that the embedded clause is left *non*finite after Exfoliation, repeated as (171) below:

(170) **Economy condition on multiple probe satisfaction [=(56)]**
When two probes can satisfy their requirements with a single operation (in (55), movement of *who*), this option blocks any alternative derivation in which the same pair of requirements are satisfied with two distinct operations (in (55), movement of *who* and merge of *it*).

(171) **Kayne-paradigm Ā-extraction impossible with an R1 predicate and expletive *it* [=(50)]**
a. *Mary, who it seems ___ to be the best candidate …
b. *Mary, who it is likely ___ to be the best candidate …
c. *Mary, who it was believed ___ to be the best candidate …

Comfortingly, therefore, some speakers actually do judge examples like (169a-c) to be unacceptable to some degree. Haiman (1974), for example, reports both (169a-b) as unacceptable (prefixing them with an asterisk). Kayne (1980, 77) cites Haiman's claim approvingly, but describes the full asterisk as "perhaps [...] overstated". An informal social media survey of native speakers revealed some sentiment along the same lines. Nonetheless, many speakers judge as mild at best the contrast between subject and non-subject Ā-extraction from extraposed clauses like those in (169). A probably universal judgment regards such examples as significantly better than the infinitival counterparts in (171) as well as finite counterparts in which the complementizer *that* is not omitted. These structures thus present a genuine problem for a derivation of an English-particular ban on hyperraising from the selectional claim in (167), as well as a challenge to the Economy condition proposed to exclude the configuration in (171).

Unfortunately, I have no general solution to offer. Nonetheless, I can show that if we provisionally accept a stipulative ban on hyperraising that applies only to A-movement, the logic by which this stipulation interacts with the Economy condition in (170) makes an interesting and possibly correct additional prediction concerning variation in the ban's coverage. This will be the promised corner of English with properties reminiscent of Lusaamia and Moro.

Van Urk (2015) has argued that the properties of A-movement are the properties of movement resulting from the interaction of a φ-probe with its goal (rather than the properties of a particular position). With this proposal as background, we may state the ban as (172), in full awareness that this formulation merely states the facts, and the problem of bans on hyperraising await a more serious resolution. The feature [±HR] marks a head as permitting or blocking hyperraising triggered by a φ-probe on that head, and the repertoire of [-HR] heads may be understood as differing from language to language:[73]

(172) **Ban on Hyperraising [to be explained someday]**
A finite clause blocks interaction between a φ-probe on an [-HR] head and its goal.

(A clause α is *finite* iff it contains TP after Exfoliation.)

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73. Whatever probe is responsible for rightward Heavy Shift in English (see footnotes 20 and 25), it too must have the [-HR] property, since the subject of an embedded clause may not be extracted into the higher verbal domain by this process, unless Exfoliation leaves behind an infinitival clause (Postal (1974, 84)):

(i) a. Sue proved ___ to be prime [every number on this list].
b. *Sue proved ___ was prime [every number on this list].

This fact is particularly interesting if Heavy Shift has Ā-movement properties (or, as seems likely, a union of A and Ā-properties, responding to a composite φ- and Ā-probe like Dinka C as analyzed by Van Urk 2015). Heavy Shift in examples like (ia) appears to license parasitic gaps, which may diagnose an Ā-property (cf. Overfelt 2016 vs. Postal 1994):

(ii) Sue proved ___ to be prime [without thinking about ___ for more than a second] [every single number on the list we gave her].

If Ā-movement may be blocked from finite domains by [-HR], one might speculate further that languages like Russian and dialects of German that permit processes like *wh*-movement to extract freely from non-finite domains, while restricting comparable movement from finite clauses, might owe this property to a [-HR] feature associated with the Ā-probe on *v*. Once again, I emphasize that the HR-feature is not an explanation, but a place-holder for a future explanation. Nonetheless, discovering that its purview includes all types of movement — not just R1 and R2 — might count as an advance relevant to figuring out why such restrictions hold in the first place.

The ban as stated correctly excludes canonical examples of A-movement hyperraising like (164a-b), while not excluding Ā-movement of the subject. As before, this selectional statement permits extraction of the subject to the higher of two CPs in the complementizerless declarative construction — on the assumption that the predicate that embeds the lower CP is [+HR]. Now note that the examples in (171a-c) satisfy (172) in the only manner possible, given a derivation that has already raised the embedded subject as far as TP or AliquiP within the embedded clause: by violating the Economy condition. The Ā-probe on the same head has chosen the subject as its goal (as it must, since it is the closest bearer of φ-features). The φ-probe on *v* has chosen the complement CP rather than the subject. This avoids a violation of the Ban on Hyperraising, at the cost of violating Economy. If Economy is a *soft constraint* outranked by the Ban on Hyperraising, the violation of Economy is permitted under these circumstances:

(173) **Constraint ranking**
Ban on Hyperraising (172) » Economy (170)

This predicts acceptability for examples like (169), a correct prediction for some (perhaps most) speakers. The judgments of speakers such as Haiman and Kayne, who report such examples as less than fully acceptable, can be viewed as reflecting a sensitivity to licensed violations of Economy that other speakers fail to perceive.

Infinitival examples like (171a-c) continue to be blocked on this proposal, because the violation of Economy is not necessary in order to avoid the Ban on Hyperraising. In these examples, the subject of the embedded clause has raised only as far as *to*P. If both the φ-probe and the Ā-probe on *v* target the embedded subject, the result obeys both constraints. The result is (52a-c), , as discussed in section 2.5.3. The examples in (171), in which the complement clause rather than its subject was picked as the goal for the φ-probe on *v*, satisfy selection, but violate Economy, and are excluded for that reason:

(174) **Alternative to (50a-c) [=(52)]**
a. Mary, who ___ seems ___ to be the best candidate …
b. Mary, who ___ is likely ___ to be the best candidate …
c. Mary, who ___ was believed ___ to be the best candidate …

Whenever two ranked soft constraints are proposed, as in (173), it is natural to ask whether the opposite ranking is also an available option for speakers of some language or language variety. If the answer is yes (and if completely unpredicted outcomes are not also found), the overall approach is supported. In the present case, we should therefore ask what is predicted if the ranking in (173) is switched as in (175):

(175) **Alternative constraint ranking**
Economy (170) » Ban on Hyperraising (172)

This ranking permits hyperraising — but only when necessary in order to avoid violating Economy. This situation will arise only when three conditions are met:

(a) an R1 or R2 predicate takes a CP complement;
(b) the subject of this CP bears Ā-features; and
(c) the subject of this CP has raised to form the specifier of TP or AliquiP within the embedded clause, before being extracted.

In fact, a pattern of R1 extraction possibilities that can be explained in exactly this fashion has been reported for some speakers of English (and explored in depth) by Danckaert and Haegeman (2017), who provide a number of internet examples:

(176) **Hyperraising in English**

a. % McDonald's has also seen an increase in the standard of hygiene across restaurants which ___ is felt ___ is attributable to the fact that the programme is now specifically about McDonald's restaurants.

b. % A recording was also made of each School and was then used to transcribe the minutes and any quotes which ___ were felt ___ were relevant to the process.

c. % [The church leaders] disagreed as to which books ___ were thought ___ were "Godly inspired". (Danckaert and Haegeman 2017, 27-28, ex. (1), (4), % added)

While examples like those in (176a-c) are judged as acceptable by some English speakers, R1 hyperraising in any other structural environment is uniformly rated as unacceptable, as Danckaert and Haegeman document at length — despite occasional attestations, such as the following, which was judged as unacceptable by Danckaert and Haegeman's consultants:

(177) **Unacceptable but attested hyperraising (English)**

(*)However, IT spending rates are expected will bottom out in 2013 and will be resilient over the long run[…]

(Google search Jan 18, 2014; http://www.gartner.com/newsroom/id/2238915)

(Danckaert and Haegeman 2017, 30, ex. (7))

Of the greatest importance to our discussion in this section, Danckaert and Haegeman also note (p. 30) that the inclusion of *that* to the left of the gap in examples like those in (176) renders the sentence unacceptable. These speakers thus show a complementizer-trace effect that constrains English hyperraising, just as observed in Lusaamia and Moro above:

(178) **Complementizer-trace effect with hyperraising (English)**

These organisations will now have the opportunity to bid for the new city funds, which are hoped (*that) ___ will help up to 150 families facing eviction.

(Danckaert and Haegeman 2017, 30, ex. (9))

Danckaert and Haegeman offer an account of their findings rooted in Rizzi and Shlonsky's (2007) analysis of complementizer-trace effects, adding several innovations to that approach that I will not discuss here. Of course, the account suggested here required an innovation of its own, the Ban on Hyperraising, which we hope will prove explainable in more general terms. Nonetheless, I will take it as a significant encouraging sign that the existence and distribution of English hyperraising follows so straightforwardly from an interaction between this stipulation and the Economy condition motivated earlier in this work. While this result should not set our minds at ease concerning the reasons for the ban itself, it does suggest that we have at least correctly characterized the problem to be solved — an advance, if true. Where English does tolerate hyperraising, the CP layer is obligatorily absent, just as it is under Ā-extraction (the more familiar complementizer-trace effect) — as predicted by the Exfoliation approach.

Let us now address an additional complication to the picture: the fact that some languages permit hyperraising but do *not* show a complementizer-trace effect. In these languages, hyperraising co-occurs with an overt complementizer. The existence of such languages should not come as a surprise, since we have already discussed languages that fail to show a complementizer-trace effect with Ā-movement, and (all things being equal) we expect the same variation for A-movement. In Italian, for example, we noted that the "skipping" strategy first identified by Rizzi (1982) permits long-distance Ā subject extraction to sidestep the complementizer-trace effect. The subject in a skipping language may move to the specifier of CP position directly from the specifier of *v*P, without stopping off in any intermediate position (which

would cause the next movement step to trigger Exfoliation) — presumably because the EPP property is optional on the heads between *v* and C in these languages (or satisfiable by some other element). All things being equal, the skipping strategy should be available for A-movement as well, yielding hyperraising with no complementizer-trace effect — so long as A-movement is independently permitted from the specifier of CP without running afoul of any ban on "improper movement". This will be the case if C bears a φ-probe, as we have assumed, and if the head triggering hyperraising is [+HR] (a point of variation among heads within and across languages).

This possibility is strongly supported by Fong's (to appear) study of hyperraising in Khalkha Mongolian. Fong shows first that in this language, the subject of a complement CP may remain clause internal and bear NOM case, as seen in (179a); or it may move to the specifier of CP position as seen in (179b), and remain there. In that position it may behave as an A-binder for processes within the embedded clause and behaves for NPI licensing like a permanent resident of the embedded clause — while nonetheless receiving ACC case from the higher clause (which overwrites NOM). Fong shows that the subject remains within CP in this construction by noting, among other things, that the CP including the ACC subject may front as a unit. She further demonstrates that the subject has raised within the embedded CP to its periphery by observing that when marked ACC it must precede possessor arguments, while the other order is possible when the subject bears NOM.

Crucially, the subject may also undergo R2 movement into the higher verb phrase, raising over higher-clause adverbials (like the subject in English R2), as seen in (179c) — while retaining the binding properties and NPI licensing properties already found to characterize nominals in the specifier of CP.

(179) **A-movement to spec,CP — and hyperraising from that position (Mongolian)**

a. Bat chang-aar [$_{CP}$ **nokhoi** gaikhal-tai gej] khel-sen.
Bat loud-INS dog.NOM wonder-with COMP say-PST

b. Bat chang-aar [$_{CP}$ **nokhoi-g** [$_{C'}$ —— gaikhal-tai gej]] khel-sen.
Bat loud-INS dog-ACC wonder-with COMP say-PST
'Bat said loudly that dogs are wonderful.'

c. Bat **nokhoi-g** chang-aar [$_{CP}$ —— [$_{C'}$ —— gaikhal-tai gej]] khel-sen.
Bat dog-ACC loud-INS wonder-with COMP say-PST
'Bat said loudly that dogs are wonderful.' (Fong to appear, ex. (5a-b))

Fong provides a variety of arguments that which make it clear that the ACC argument in such examples has indeed undergone R2-type movement from the embedded clause, i.e. that examples like (179c) do not instantiate prolepsis or object control. These include idiomatic reading preservation, scope reconstruction, and difficulties with remnant movement of the embedded clause. She also shows that both movement to specifier of CP and further movement into the higher VP have the properties of A-movement — and thus must be responding to φ-probes, if Van Urk's proposals are correct.

No evidence available to me bears directly on the question of whether the initial movement to the specifier of CP involves the skipping strategy (i.e. direct movement from the specifier of *v*P), since it is not clear at present whether Mongolian subjects in general must raise out of the *v*P or may remain *v*P-internal as in Italian. Nonetheless, it is at least plausible to propose that Mongolian subjects show Italian-

like behavior, in which case we have an explanation for why Mongolian differs from Lusaamia, Moro, and (varieties of) English in permitting hyperraising to co-occur with an overt complementizer.[74]

In this connection, it is important to check that Mongolian also permits Ā-movement of the subject to exit its clause without a complementizer-trace effect, i.e. without triggering Exfoliation (again, arguably due to the skipping strategy). Though fully convincing evidence is not available, what is known from the literature is consistent with a positive answer. Oseki and Miyamoto (2014) note the possibility of an embedded subject gap in the long-distance comparative in (180a) — a relevant example if Mongolian comparatives involve Ā-movement of the comparative operator, like their English counterparts (Chomsky 1977) . Interrogative *wh*-elements are generally pronounced in situ in Mongolian, but the possibility of a subject *wh*-phrase cooccurring with an overt complementizer in (180b) is also relevant, if it can be shown that Mongolian questions involve covert *wh*-movement rather than some strategy of in-situ interpretation such as focus alternative computation (Beck 2006; Cable 2010; Kotek 2014a; among others).[75]

(180) **Absence of complementizer-trace effect in Mongolian (available evidence)**

a. **OP** [John-ø [___ Mary-tai üge_kelelče-jei gejü] bodu-ɣsan eče] qola olan
John-NOM Mary-with talk-PST COMP think-PST than far many
toɣan-nu kümün-ø Suzie-tai kelelčejü bai-jai.
number-GEN people-NOM Suzie-with talk be-PST
'More people wanted to talk with Mary than John thinks talked to Mary.'
(Oseki and Miyamoto 2014, ex. (23))

b. ___ Tüünii eej [**khen** geriin daalgavar-aa khii-sen gej] khel-sen be?
3SG.GEN mother who homework REFL.POSS do-PST COMP say-PST Q
'Who did her/his mother say did/his homework' (Fong to appear, ex. (105a)

Fong provides two arguments in favor of covert *wh*-movement in Mongolian: sensitivity to adjunct and *wh* islands; and interactions with the locality condition on reflexive binding that diagnose covert movement into a higher clause. We may thus tentatively conclude that Ā-movement behaves uniformly with A-movement in Mongolian in failing to show a complementizer-trace effect.

Though I do not have an independent argument that hyperraising proceeds via the specifier of CP in other languages, the proposal just discussed for Mongolian might also be the right explanation for the languages of the Balkan *Sprachbund* that also appear to permit R1 and R2 hyperraising from clauses introduced by a complementizer — and others as well, such as Brazilian Portuguese, for which a comparable analysis has been suggested by Fong (2018). Bird et al. (1999), for example, present arguments from reconstruction effects and idiom interpretation in Modern Greek in favor of the proposal that aspectual verbs license R1 in that language. Like other languages of the area, Greek systematically lacks infinitives, so the relevant examples instantiate hyperraising — and crucially co-occur with an overt complementizer:

(181) **Hyperraising co-occuring with complementizer (Greek)**
Ta pedhia arxisan na trexoun
the children.NOM started.3PL COMP.SBJV run.3PL
'The children started to run' (Bird et al. 1999, ex. (11))

74. The possible relevance of skipping is the only aspect of our discussion of Mongolian that is original here. All other aspects of the discussion are summarized from Fong.

75. Example (180b) was designed by Fong to show a weak crossover effect with *wh*-movement (the pronoun may not be bound by the *wh*-phrase), irrelevant to our discussion. Though I have not had independent access to a speaker with whom I might check, there is no reason to believe that replacing 'his/her mother' with a pronoun-less subject would alter the acceptability of the example.

Since Greek permits subjects to remain *v*P internally, much like Italian, and thus permits a skipping strategy to side-step complementizer-trace effects with Ā-movement, exactly this strategy should be available for A-movement, if A-movement through the specifier of CP is not deemed "improper" due to the presence of a φ-probe on C, and the relevant attracting heads count as [+HR] for the Ban on Hyperraising (172) (or whatever lies behind this ban).

Matthew Hewett (personal communication) has called my attention to another case of hyperraising over a complementizer for which a skipping derivation is plausible. Zyman (2018, 99-103) argues that Janitzio P'urhepecha (a language isolate of Michoacán State, Mexico) displays R2 hyperraising from fully inflected clauses introduced by a complementizer:

(182) **R2 hyperraising co-occurring with complementizer (Janitzio P'urhepecha)**
Emilia ueka-sïn-∅-di Xumo-ni mintsita-ni jingoni eska jaruata-a-∅-ka pauani.
Emily want-HAB-PRS-IND3 Xumo-ACC heart-ACC with that help-FUT-PRS-SJV tomorrow.
'Emily wants Xumo with all her heart to help her tomorrow.' (Zyman 2018, 100, ex. 131)

Zyman offers several arguments that *Xumo-ni* in (182) is in the higher clause but has moved there from the embedded clause, and does not instantiate prolepsis or object control. Crucially, as Hewett pointed out, Zyman argues independently that subjects in Janitzio P'urhepecha may remain in an internal *v*P position. In the relevant examples, the subject is found to the right of the verb, which itself surfaces to the left of an adverb that he argues must occupy a dedicated and very low position in the clause:

(183) **Subject may remain *v*P internal (Janitzio P'urhepecha)**
Mentku isï sesi pire-sïn-∅-di Maria ima-ni pirekua
always thus well sing-HAB-PRS-IND3 Mary that$_{DIST}$-ACC song
'Mary always sings that song well.' (Zyman 2018, 126, ex. 174)

It is thus possible that Janitzio P'urhepecha also permits hyperraising from a full CP thanks to a skipping strategy that permits the raised nominal to exit via the specifier of CP.

Nonetheless, such patterns may have multiple sources. Zulu is another language that shows hyperraising without a complementizer-trace effect. Though it is not inconceivable that the same analysis motivated for Mongolian could also account for Zulu hyperraising, Halpert (2018) has argued for a different analysis that does not require the specifier of CP to serve as an intermediate landing site. As we shall see, Halpert's proposal (like Fong's) is also compatible with our overall approach, and could be adopted into the framework developed here virtually without alteration. I will leave open the question of which approach is correct, including the question of whether they should be viewed as competitors or as complementary routes to a similar outcome across languages.

Zulu shows both R1 and R2 raising from clauses introduced with an overt complementizer. Examples (184a-b) show this possibility for R1, with the use of an idiom arguing for movement. Zulu R2 involves additional complications that I omit here.

(184) **R1 without Exfoliation (Zulu)**
a. ku-bonakala [ukuthi iqhina li-zo-phuma embizeni] *no R1*
17s-seem COMP AUG.5steinbok 1s-FUT-exit LOC.3cooking.pot
b. iqhina li-bonakala [ukuthi ___ li-zo-phuma embizeni] *R1, overt C*
AUG.5steinbok 5s-seem COMP 5-FUT-exit LOC.3cooking.pot
'It seems that the steinbok will leave the cooking pot.' (idiom)
i.e. 'It seems that the cat will be out of the bag.' (Halpert 2018, 6, ex. (19a-b))

The higher verb in (184a) shows class 17 agreement, which Halpert argues reflects agreement with the nearest goal for a φ-probe on T: the embedded CP. Unsurprisingly for an R1 construction, the R1 verb in (184b) shows class-5 agreement with the class-5 raised subject. Significantly, however, this is not the only available agreement pattern in such constructions. The verb may also continue to agree with the embedded clause, in free variation with agreement triggered by the raised subject. The examples in (185b-c) show the two patterns:

(185) **R1 verb agrees with raised subject or with complement clause (Zulu)**

a. **ku**-bonakala [ukuthi uZinhle u-zo-xova ujeqe] *no R1/CP agr.*
17-seem that AUG.1Zinhle 1s-FUT-make AUG.1bread

b. uZinhle **u**-bonakala [ukuthi ___ u-zo-xova ujeqe] *R1/subj. agr.*
AUG.1Zinhle 1s-seem COMP 1-FUT-make AUG.1bread

c. uZinhle **ku**-bonakala [ukuthi ___ u-zo-xova ujeqe] *R1/CP agr.*
AUG.1Zinhle 17s-seem COMP 1s-FUT-make AUG.1steamed.bread
'It seems that Zinhle will make steamed bread.'
(Halpert 2018, 14-15, ex. (35a-b),(36); citing Halpert 2012, 2016)

Abstract verbal agreement with a complement clause has already been invoked twice before: in section 2.4.1, where it provided an explanation for the apparent optionality of R1 and R2 constructions even when raising is otherwise available; and in section 2.5.3, where it interacted with the same Economy condition that played a key role in the discussion of English hyperraising just concluded. If Halpert is correct, Zulu constructions like (185a)and (185c) instantiate the same kind of agreement overtly, with class-17 verbal morphology.

Halpert's most important claim relates the free variation in agreement patterns to the derivational history of R1 constructions. She notes first that the probe relevant to subject agreement morphology has an EPP requirement — which a full finite CP is not able to satisfy:

(186) **Finite CP may not function as a preverbal subject (Zulu)**
*[ukuthi w-a-thatha umhlala phansi] ku-ya-ngi-mangaza
COMP 1S-PST-take AUG.1sit down 17S-YA-1SG.O-surprise
Intended: 'That he retired surprises me.' (Halpert 2018, 19, ex. (47),(36)

Consequently, if the EPP-bearing φ-probe responsible for subject agreement chooses a complement CP as its goal and agrees with it, the derivation will fail because of the unsatisfied EPP property — unless the probe is able to try again, searching inside CP for a goal that *is* capable of satisfying its EPP property. (A similar connection was made by Nunes 2008, 99 ff.). Halpert proposes that this is exactly what happens in Zulu R1 constructions, and that the alternative morphological agreement patterns seen in (185b)and (185c) reflect a free choice as to whether it is the first or second instance of agreement that gets reflected morphologically. Crucial to Halpert's analysis is a proposal by Rackowski and Richards (2005) (with arguments from Tagalog) that agreement between a probe and a CP or DP phrase renders that phase transparent, by eliminating its phasal status. In the Zulu scenario summarized above, agreement between the R1 φ-probe and the complement CP "unphases" the interior of the CP. Consequently, when the probe agrees for a second time, with the subject of the embedded clause, its goal can be extracted from the clause without needing to occupy its edge.

Halpert's proposal can be incorporated wholesale into the derivational theory of clause size developed here, offering a second way in which hyperraising might take place without a complementizer-trace effect. If agreement between the R1 probe and the embedded CP removes the phasal status of that CP, Exfoliation

will not be triggered when the embedded subject is raised, since the probe and goal are no longer separated by a phase boundary. Consequently, the pattern in (185b) and (185c) can be explained in an Exfoliation approach exactly as Halpert explains it (presupposing a lexicalist approach to clause size). As predicted, Ā-movement of the embedded subject is also possible in Zulu without a complementizer-trace effect, showing that the puzzle of Zulu subject extraction is not particular to A-movement:

(187) **Ā-movement shows no complementizer-trace effect (Zulu)**
ubani uSipho o-cabanga ukuthi u-zo-fika?
AUG.1who AUG.1Sipho 1REL-think COMP 1SG-FUT-arrive
'Who does Sipho think will arrive?' (Claire Halpert, personal communication; field notes)

Furthermore, not only does the theory predict the absence of a complementizer-trace effect with R1 hyperraising, it also predicts the impossibility of R1 from a nonfinite clause, if CP is always targeted first for agreement. No extraction from a CP that has been targeted by agreement will ever trigger Exfoliation, if the CP has been unphased. This prediction solves the central puzzle of Halpert's paper: why Zulu exclusively permits *hyper*raising, and never permits English-style raising from a nonfinite clause — and has an immediate explanation in an Exfoliation variant of her proposal as well. If an infinitive can only be created by Exfoliation, and the structural conditions on Exfoliation are as stated here, dephasing will always bleed Exfoliation and block the formation of an infinitival clause.

Finally, with our adaptation of Halpert's proposals, the absence of R1 in examples (185a) could be attributed to the optionality of the EPP property on the R1 φ-probe. The existence of languages like Lusaamia and Moro in which hyperraising does show a complementizer-trace effect could be understood as reflecting an absence of agreement with the object CP (or perhaps the inability of agreement to dephase the CP as it does in Zulu). I will leave these issues open.

The Exfoliation version of Halpert's theory makes an additional interesting prediction. All things being equal, we never expect to find R1 co-occurring with CP agreement rather than subject agreement under any circumstance other than hyperraising across an intact CP. As it happens, there is a small literature that cites some examples of this agreement pattern outside Bantu, all compatible with this prediction. Fernández-Salgueiro (2005, 2008), for example, observes that several Romance languages (Spanish, Galician, European Portuguese, Italian and Catalan) allow R1 hyperraising with one of the two patterns observed in Zulu: invariant 3SG agreement on the higher verb, which we might plausibly analyze as agreement with the embedded clause. He cites Spanish, Galician, European Portuguese, Italian and Catalan as showing this construction. Simonović and Arsenijević (2014), building on observations by Klajn (2007), note a similar possibility in Serbian with the modal verb *trebati* 'ought/need' — proscribed by the normative tradition, but described by Simonović and Arsenijević as "not problematic for most speakers":[76]

76. As Simonović and Arsenijević (2014) discuss, in the compound past tense (formed with a copula and past active participle), speakers prefer uniformity in agreement pattern, with both auxiliary and participle showing 3SG.N agreement. This raises a locality question if the subject stops in the specifier of the higher *v*P on its way to the specifier of TP (since it should be the closest goal for T in that position), which I will not explore here. They do note that a mixed agreement pattern is also accepted by some speakers (though with some reluctance) , in which the auxiliary verb agrees with the raised subject but the participle does not.

In addition, though the pattern described in the text is limited to the single raising verb *trebati* 'ought/need', Ilić (2015) notes a similar possibility for a range of other verbs that do not otherwise permit raising, with a twist: R1 is possible only if the raised subject is itself 3SG.N, so that it is ambiguous whether the verb has agreed with the embedded clause or the raised subject:

(188) **Hyperraising with 3SG agreement on the raising verb**

a. Estes nenos parece [que son moi listos]. *Galician*
these kids seem.**3SG** COMP are.**3PL** very smart.M.PL
'These kids seem to be very smart.' (Fernández-Salgueiro 2008, 299, (5))

b. Mi ne treba [da dođemo], ali ipak dolazimo. *Serbian*
we NEG should.**3SG** COMP come.**1PL** but nevertheless come.1PL
'We shouldn't come, but we're coming nevertheless.'
(Simonović and Arsenijević 2014, 6, (3b); translation mine)

As far as I can tell, the examples of this agreement pattern attested in the literature are limited to hyperraising environments, as predicted.[77] Should this correlation hold up across a wider range of languages, it provides an additional argument for Halpert's proposal in an Exfoliation setting.

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a. To se ispostavilo da je bilo tačno.
that.NOM.N.SG SE turn.out.PTCP.**N.SG** COMP AUX.3SG be.PST.N.SG true.N.SG
'That turned out to be true.'

b.* On se {ispostavilo/ispostavio} da je pao ispit.
he.NOM SE turn.out.PTCP.{**N.SG/M.SG**} COMP AUX fail.PTCP.M exam.ACC.SG
'He turned out to have failed the exam.' (Ilić 2015, 72-73, ex. (13)-(15))

This is an observation strikingly reminiscent of the agreement behavior of Icelandic quirky subject/NOM object verbs as analyzed by Sigurðsson (2004) and Schütze (2003), discussed in section 2.6.2 above. Recall Sigurðsson's proposal that the verbal morphology in such sentences must be ambiguous (or nearly so) between the neutral agreement expected of a quirky subject and the fuller agreement pattern expected of agreement with the NOM object.

I am grateful to Ljiljana Progovac for discussion of this work and the examples cited.

77. Nedžad Leko (personal communication) notes that the construction in (188b) accords with his Bosnian judgments as well, but the non-hyperraising option of replacing the finite complement with an infinitive (more common in Bosnian usage than Serbian) is available only if the higher verb agrees with the raised subject, supporting the generalization stated in the text:

a. Mi treba [da pjevamo], a ne da plačemo.
we should.**3SG** COMP sing.**1PL**, and not COMP cry.**1PL**.1PL

b. Mi ✓trebamo/*treba pjevati, a ne plakati.
we should.**1PL**/**3SG** sing.**INF**, and not cry.**INF**
'We should sing, and not cry.'

Chapter 5

Non-obvious subject extraction: English *for* and control

Crucial to much of our discussion has been the claim that every smaller-than-CP clause is the consequence of Exfoliation. This in turn entails that extraction has taken place from a high but initially non-edge position within the clause. Illegal infinitivization, for example, was argued to be the right diagnosis for the deviance of many examples of non-finite clause embedding previously analyzed as Case Filter violations, as discussed in section 2.5. In a similar vein, the English complementizerless finite declarative clauses discussed in section 3.4.1 were analyzed as a consequence of subject raising from a finite CP (triggering Exfoliation of the CP layer) into a higher CP superstructure whose complementizer is unpronounced (as a consequence of the Exposure Condition). Evidence from adverb ordering supported this analysis, which also dovetailed with the account of the amelioration of complementizer-trace effects in section 3.2.

The subject extraction posited as the trigger for Exfoliation is not always self-evident. The question of subject extraction in R2 constructions, for example, was the topic of controversy for many years because it is often string-vacuous, i.e. with no effect on word order. The subject extraction posited here as a crucial component of the analysis of complementizerless finite clauses (following Pesetsky and Torrego 2001, 2007) is similarly non-obvious.

Wherever we find a reduced clause whose subject does not appear to have moved, similar issues arise. That is the topic of this chapter.

5.1 English *for*-infinitivals and *that*-subjunctives

5.1.1 *for-infinitivals as instances of R2*

We first consider English infinitival clauses introduced by *for*. This element was described by Rosenbaum (1967, 24) as a type of complementizer, which has remained the standard analysis ever since:

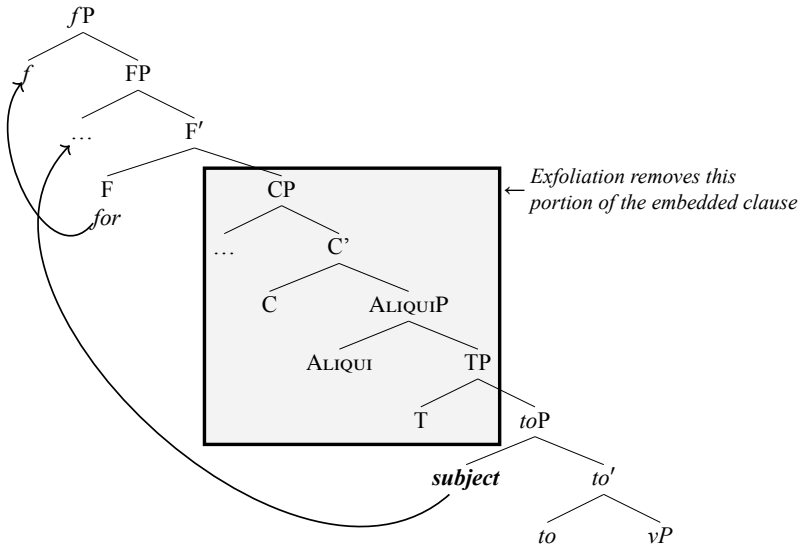
(189) ***for*-infinitives (English)**

a. Mary is eager [for Sue to talk as scheduled].

b. [For the cat to be out of the bag already] would not be surprising.

The proposals developed in preceding chapters permit only one analysis of this construction: one in which *for* has the syntax of an R2 predicate. On this analysis, *for* belongs to a superstructure built above a finite CP as its complement, consisting of a lower head F and a higher head *f*, analogous to V and *v*. The lower head F bears an R2 probe with an EPP property and raises to *f*, just as *v* raises to V.

(190) **R2 syntax of *for***



Drawing a connection between *for* and R2 is not new. It lies at the heart of the standard case-theoretic treatment of the subject of infinitival clauses, in the context of the lexicalist theory of clause size (Vergnaud 1976/2006; Chomsky 1980, 30 and 1981, 66). This approach posits that subjects are specially case-licensed in both the immediate environment of *for* and the immediate environment of an R2 verb. As noted above, it has been controversial whether the subject was extracted into the higher VP or remained in situ in the R2 construction (because ditransitive verbs are independently attested) — but it was taken for granted that the subject in a *for*-infinitive remains in situ (probably because ditransitive complementizers are not otherwise attested). The claim that the subject of a *for*-infinitival has been extracted from its original clause is thus a major novelty of the proposal sketched in (189) — as is, of course, the claim that the clause from which it is raised started its life finite.[78]

The proposal that the subject has raised out of its original CP (into the *for* superstructure) is supported by an observation parallel to one that supported the subject raising analysis of complementizerless finite clauses in (135): the subject must appear to the left of adverbs associated with the embedded clause.

(191) **Adverbials may not precede subject in *for*-infinitival clauses (English)**
- a. Mary demanded [for (*sometimes) Bill to arrive on time].
- b. We would prefer [for (*most of the time) Mary to accept this solution].

In early case-theoretic approaches to the syntax of *for*-infinitivals, this fact, like its counterpart with R2 verbs in (9), was attributed to an adjacency condition on the relation between *for* and the embedded subject claimed to rely on it for case-licensing. In a derivationalist context like the one developed here, where

78. As Postal 1974, 85, ex. (5b) noted, one difference between *for*-infinitives and R2 constructions is that the former, but not the latter, permit rightward Heavy Shift of the embedded-clause subject:
*Mary is eager [for ___ to talk as scheduled] [all the speakers who arrived late because of the airline strike].
See footnotes 20, 25, and 73 for prior discussion of the probe that might trigger Heavy Shift of an embedded subject. I have no explanation to offer for the absence of such a probe in the *for*-domain short of stipulating its exclusion for now.

the subject of an infinitival clause is not in any special need of licensing, it is noteworthy that an alternate explanation for these facts is not only available but directly entailed by the theory.[79]

While I have no direct argument that *for*-infinitives embed an indicative CP before Exfoliation, modification and anaphora patterns do suggest the presence of an indicative core within such clauses. It has been observed since at least Bresnan (1972, 76 ff.) that *for*-infinitives have a characteristic (though poorly understood) semantics, adding an irrealis or generic component to the clause. By contrast, a *for*-infinitive may not have a factual, non-irrealis, non-generic use, as illustrated by (192c) below:

(192) **Semantics of the complementizer *for* (English)**

a. [For it to rain] would be helpful.	*irrealis*
b. [For it to rain] is always helpful.	*generic*
c. #[For it to rain] was helpful last night.	*non-irrealis/future, non-generic*

Let us focus our attention on the irrealis use of such clauses, where the argument in favor of a finite indicative core is easier to construct. Our starting point is the observation that a relative clause introduced by *as* or *which*, if added to a *for*-clause with irrealis/future semantics, may exclude the irrealis component entirely:

(193) **Relative clause modification of *for*-clause (English)**

I would have preferred for there to be ice-cream at the party,…

a. *realis:* …as/which Mary mistakenly reported. *...i.e. that there was ice-cream at the party.*

b. *irrealis:* …as/which you would also have preferred. *...i.e. for there to be ice-cream at the party.*

I propose that the realis-modifying relative clause in examples like (193a) is attached to the indicative finite CP layer, the clause with which F merges in a structure like (190), while an irrealis-modifying relative clause like that in (193b) merges with a higher layer, either *f*P or FP. This proposal predicts that if an irrealis-modifying and realis-modifying relative clause are stacked, the irrealis-modifying clause should always occur structurally higher than (i.e. to the right of) the realis-modifying clause. As (194) shows, this prediction is correct:[80]

---

79. *For*-infinitives with non-nominal subjects are not possible in the first place — a fact that can perhaps be stipulated as reflecting a pickier R2 probe on *for* than is found on verbs. Nonetheless, to the extent they can marginally be accepted at all, the intervention of an adverb between *for* and the non-nominal subject increases the deviance substantially. This is expected if the marginal acceptance of these examples indicates a coercion of the φ-probe on *for* to accept a wider range of goals, but it is hard to imagine any tweaking of the adjacency requirement on case licensing that would yield a similar result on standard lexicalist approaches:

a. *Mary is eager for (**sometimes) that the world is round to count for something.

b. *We would prefer for (**most of the time) in this room to be held the open meetings required by law

c. *John demanded for (**surprisingly) even more beautiful than the Taj Mahal to be the new city hall.

80. I find stacked clausal relatives awkward if they are both introduced by the same element, whether *which* or *as.* For that reason, I have uniformly used *as* for the first relative clause and *which* for the second. I do not find the judgments alter if I make the opposite choice; and the contrast remains if the same element is used in both clauses as well.

Amy Rose Deal (personal communication) asks whether linear order, rather than structure, might be at stake in these judgments — and suggests that the result of replacing stacking with coordination might support this characterization of the data. In Deal's judgment, a similar restriction emerges, distinguishing "*...as Mary mistakenly reported and which you would have preferred too"* as more natural than the opposite order of coordination. I am not sure I share these judgments, but will leave this question open.

(194) **Irrealis-modifying relative clause must stack outside realis-modifying relative clause with *for* clause (English)**

a. I would have preferred for there to be ice-cream at the party, as Mary mistakenly reported, which you would have preferred too.
(✓ *with the first RC modifying "that there was ice-cream at the party"*)

a′. I would have preferred for there to be ice-cream at the party, which you would have preferred too, as Mary mistakenly reported.
(?? *with the second RC modifying "that there was ice-cream at the party"*)

b. John would be happy for the reports to be false, as you claim, which we all want.
(✓ *with the first RC modifying "that the reports are false"*)

b′. John would be happy for the reports to be false, as we all want, which you claim.
(?? *with the second RC modifying "that the reports are false"*)

The indicative layer also shows its presence when it functions as an antecedent for anaphora in examples like (195), where the antecedent for *it* on the analysis above is the indicative clause that F takes as its complement:

(195) **Indicative core of *for*-clause supports anaphora (English)**
I am anxious for her to finish her dissertation, so I can report it to the registrar.
i.e. ...so I can report [*that she finished her dissertation*] *to the registrar.*

One property that the present analysis cannot escape sharing with earlier approaches is the ability of *for* to assign a new case to the raised subject. Just as in a verbal R2 construction, NOM case on the subject is overwritten by case assigned by some element in the higher domain, with consequences not only for pronominal morphology but also for the availability of reflexive pronouns that might otherwise be excluded by the Anaphor-Agreement Effect, as discussed in section 2.6.1 in connection with example (64). I will assume, with Vergnaud (1976/2006) and others, that the prepositional origins of *for* permits one of the superstructural elements in (190), perhaps F itself, to assign this new case to the raised subject by whatever process is responsible for case assigned by normal prepositions.

5.1.2 *A note on raising to P*

This treatment of *for* might be extended to other constructions that have sometimes been argued to show raising into a prepositional domain. Our R2 analysis of *for*, for example, mirrors an analysis proposed by Merchant (2009, 151-156) for a comparative construction in Greek in which the subject raises from an embedded CP (the standard of comparison) into a higher prepositional domain. In the analysis Merchant proposes, the subject raises to form a specifier of the P that takes the CP as its complement, and the P then raises to *p* (followed by ellipsis of the remnant CP, yielding the false impression of a non-phrasal comparative). The case that surfaces on the raised subject is the case assigned by the P, assumed by Merchant to overwrite any case that was assigned earlier, as in our analysis of *for* (and R1 and R2 more generally). (I am grateful to Jason Merchant for bringing his paper to my attention.)

Preposition-triggered R2 might also be the right analysis for English examples like those in (196), claimed by Postal (2004, 83-108) to instantiate raising to the complement position of PP:

(196) a. I depended on my car to start in the winter.
b. I depended on the nurse to watch over my uncle.
c. I depended on the alarm to go off at the right time. (Postal 2004, 91, ex.(13b-d))

As Postal notes, the ability of the post-prepositional DP to follow higher-clause adverbs as in (197) shows that it is not located in the subordinate clause, while standard idiom and expletive subject tests as in (198) show that these are not structures of control:

(197) a. One can count on the ex-president with a high degree of confidence to lie on most public occasions.
b. They were depending on the monster, apparently, to rush back into the cave.
c. Most staff members were relying on the director in a touchingly naive way to do the right thing. (Postal 2004, 90, ex.(11))

(198) a. They were counting on the shit to hit the fan when the new director arrived. (Postal 2004, 93, ex.(26d))
b. I can always depend on it to rain on days when I forget my umbrella. (https://www.merriam-webster.com/dictionary/depend%20on/upon, accessed December 12, 2018)
c. Mary is counting on lots of attention to be paid to this problem.

Postal proposes that these structures instantiate raising from the subject position of a clausal complement of the higher verb to the complement position within an independent PP complement of the same verb:

(199) …depend [$_{PP}$ on it] [___ to rain…]

Alternatively, however, we might give these examples an analysis modeled on Merchant's proposal and our analysis of clause-introducing *for*. On this view, the subject does not raise into a PP independent of its source clause — but rather forms the specifier of a P that takes the source clause as its complement, with subsequent P-to-*p* raising:

(200) …depend [$_{pP}$ on + *p* [$_{PP}$ it ___ [___ to rain…]]]

The proposals make different predictions concerning constituency. On the proposal sketched in (199), the preposition and raised subject form a constituent, while on the proposal in (200), they do not. Examples like those in (201) below favor (200) (unless some other factor is at work, such as an independent notion "unextractable PP" to which Postal (p.351-2, fn1) attributes such judgments):[81]

(201) a. *On the shit they were counting to hit the fan when the new director arrived.
b. *On it I can always count to rain on days when I forget my umbrella.
c. *On how much attention is Mary counting to be paid to this problem?

5.1.3 *Subjunctive complements*

Another possible extension concerns subjunctive complements in English. On the face of it, *for* looks like an element whose selectional properties permit only *to*P complementation (post-Exfoliation), unusable ex-

81. For this analysis to be correct, however, higher-clause adverbs that one might expect to be dependents of the higher verb must be permitted to merge into the PP for which the verb selects, to derive example like those in (197). This raises questions about the syntax and semantics of such subcategorized PPs that I will leave for further research.

Another open question concerns the question of whether "undermerge" derivations (complement-forming movement; Pesetsky 2013, 26 ff.) like (199) are available to any language, or whether they are excluded in principle. McCloskey (1984) not only argued for raising to P in Irish, but also distinguished it behaviorally from an Irish counterpart to the English *for* construction. Yuan (2017b) presents forceful arguments for undermerge to Focus in Kikuyu; and Pesetsky (2013) proposed that head movement of the traditional sort be understood as an instance of undermerge. Thus this matter too remains open (as does the question of how the child acquiring language chooses the correct analysis).

cept when the embedded subject raises from the specifier of *to*P. Some uses of *for*, however, alternate with subjunctive clauses introduced by *that* — clauses that can be identified as subjunctive in modern English by the absence of 3SG agreement morphology. Significantly, these clauses disallow adverbs intervening between *that* and the embedded-clause subject — just like their counterparts with *for*, but unlike indicative clauses also introduced by *that*.

(202) **Adverbials may not precede subject in subjunctive clauses (English)**

a. Mary demanded [that (*sometimes) Bill arrive on time].
like (191a) vs. *Mary said that sometimes Bill arrives on time.*

b. We would prefer [that (*most of the time) Mary accept this solution].
like (191b) vs. *We know that most of the time Mary accepts this solution.*

Relative clause modification suggests that they include an indicative core inside the subjunctive layer, again just like *for*-infinitives:

(203) **Irrealis-modifying relative clause must stack outside realis-modifying relative clause with subjunctive *that* (English)**

a. I would have preferred that there be ice-cream at the party, as Mary mistakenly reported, which you would have preferred too.
(✓ *with the first RC modifying "that there was ice-cream at the party"*)

a′. I would have preferred that there be ice-cream at the party, which you would have preferred too, as Mary mistakenly reported.
(*?? with the second RC modifying "that there was ice-cream at the party"*)

b. John demanded that the reports be falsified, just as you claim, which we all wanted.
(✓ *with the first RC modifying "that the reports were falsified"*)

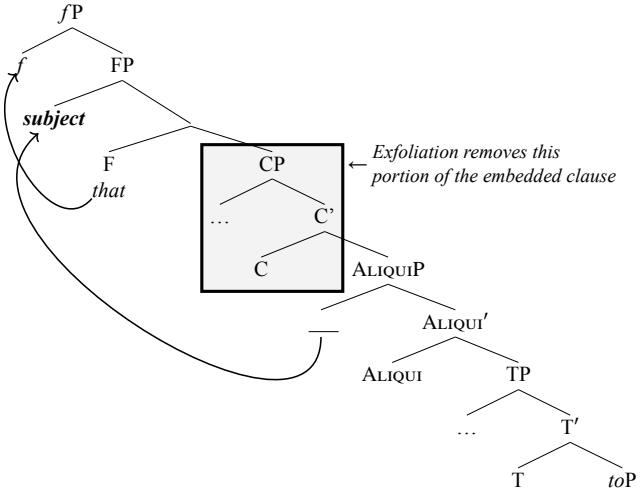
b′. John demanded that the reports be falsified, just as we all wanted, which you claim.
(*?? with the second RC modifying "that the reports were falsified"*)

Anaphora to this layer is also possible:

(204) **Indicative core of subjunctive *that*-clause supports anaphora (English)**
I demand that she finish her dissertation, so I can report it to the registrar.
i.e. ...so I can report [*that she finished her dissertation*] *to the registrar.*

These facts suggest that the subjunctive complementizer might be a hyperraising allomorph of *for* (without the prepositional property of assigning its own case), and that subjunctive clauses in English are therefore R2 constructions in which the subject raises from a finite indicative CP.

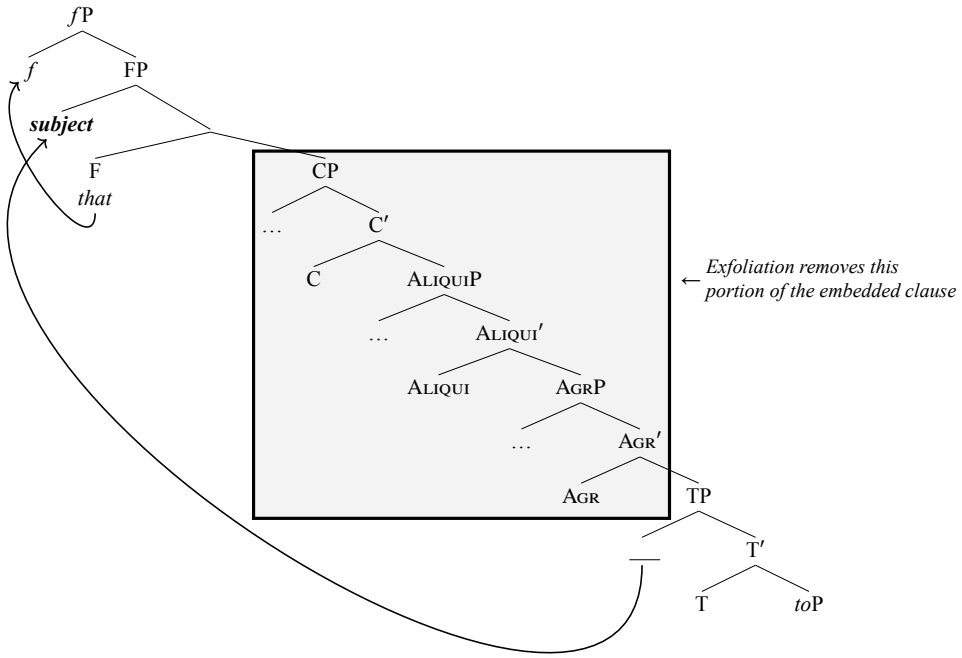
(205) **R2 syntax of subjunctive *that* (first proposal)**



I used the phrase "subjunctive complementizer" above, rather than "*that*", because a question now arises concerning the pronunciation of this allomorph of *for*. The instance of *that* that we hear might be an allomorph of *for*, accidentally homophonous with the normal indicative complementizer. This is the simplest hypothesis, and the one diagrammed in (205). Alternatively, however, *that* might be the indicative complementizer itself, raised to F and then to *f* — thus escaping CP before Exfoliation eliminates its original position. In that case, the fact that *for* is unpronounced might be an expected consequence of the Exposure Condition, and what is special about *for* in derivations that yield a subjunctive complement is the twin property of attracting C and tolerating a complement larger than *to*P post-Exfoliation. I will leave this matter open.

Finally, though the structure in (205) somewhat conservatively presents CP as the only projection eliminated by Exfoliation (and shows the subject having raised as far as the specifier of AliquiP), this might not be accurate. The proposal needs a theory of subjunctive morphology, which consists of the absence of otherwise expected 3sg agreement. If (205) is correct, we might view this morphology as something directly imposed by F in some fashion when its complement remains finite post-Exfoliation. Alternatively, however, the absence of 3sg agreement morphology in the English subjunctive might be an anti-agreement effect of the sort discussed in section 4.1. If so, Exfoliation must be taken to eliminate somewhat more material than is shown in (205). On this view, the English clausal spine between *v* and C might include a head AgrP responsible for subject agreement, located between TP and AliquiP. If the subject moves to the specifier of TP (i.e. not as far as AgrP) and is then probed by F across the CP boundary, Exfoliation will remove CP, AliquiP, and AgrP — but *to* will not be exposed. The result would be an agreementless clause without overt *to,* i.e. the morphology of the English subjunctive:

(206) **R2 syntax of subjunctive *that* (antiagreement alternative)**



5.1.4 *Subject extraction from for-infinitivals and that-subjunctives*

Let us assume that *f*P is phasal and now ask about extraction of the subject from this domain. If the embedded subject always raises to form a specifier of FP in the constructions discussed above, any movement of the raised subject to the specifier of *f*P will violate LAAC, and thus should be blocked as an anti-locality consequence of that constraint. As a result, the only way for the subject of a *for*-infinitive or *that*-subjunctive to be extracted is for a higher probe to find it across the *f*P boundary, which will trigger Exfoliation of the *f*P layer. We thus expect subject extraction to show an effect analogous to the complementizer-trace effect, i.e. a *for*-trace effect with irrealis infinitives and a *that*-trace effect with subjunctive clauses.

This effect can be seen for A-movement when an R2 predicate takes an infinitival *f*P as its complement. The repertoire of such R2 verbs in English (called "W-verbs" by Postal 1974) varies somewhat from speaker to speaker, but verbs like *want, prefer*, *like*, and *need* probably fall in this category for all speakers. They all permit *for*-infinitives as complements, but also can raise the embedded subject much like R2 verbs that take indicative *that*-clauses, in which case *for* is no longer present:

(207) **R2 from *for*-clauses (English)**

a. Sue wants (for) Mary to win.
b. Bill would prefer (for) it to rain tomorrow rather than today.
c. We would like (for) John to listen to us.
d. They need (for) the package to be delivered quickly.

That R2 has taken place can be seen in the fact that the subject in the *for*-less variant precedes higher-clause VP adverbs, as noted by Postal (1974, 186), among others:

(208) **R2 across VP adverbs from *for*-clauses (English)**

a. Sue wants Mary a bit self-interestedly to win.
b. Bill would prefer it quite strongly to rain tomorrow rather than today.
c. We would like John with all our hearts to listen to us for a change.

d. They need the package desperately to be delivered quickly.

For reasons that remain mysterious, however, R1 does not appear to be possible from a *for*-clause. This has been observed as a fact about passivization by Bresnan (1972, 156-157) (reporting joint research with Howard Lasnik):

(209) **R2 across VP adverbs from *for*-clauses (English)**

a. *Mary is wanted ___ to win the prize.

b. *It would be preferred ___ to rain tomorrow rather than today.

c. *John would be liked ___ to listen to us for a change.

d. *The package is needed ___ to be delivered quickly.

In fact, this generalization is not limited to passivization of R2 verbs. I am also unaware of any plausibly unaccusative verb or adjective in English that shows an alternation between (a) an expletive as subject and a *for*-clause as complement and (b) raising of the embedded subject to the subject position of the higher clause — along the lines of alternations familiar from predicates like *seem* and *likely.* That is, there are no R1 counterparts to the W-verbs:[82]

(210) **No R1 alternations from *for*-clauses (English)**

a. It would be fun for Mary to win the competition. ↜ *Mary would be fun to win the competition.

b. It would be useful for it to rain tomorrow rather than today ↜ *It would be useful to rain tomorrow rather than today.

c. It would be desirable for John to listen to us. ↜ *John would be desirable to listen to us.

It looks like a φ-probe located anywhere other than V is simply incapable of extracting the raised subject from *f*P.

But this generalization as well may be too narrow, since the *Ā-probe* on *v*, *a*, etc. appears subject to the same limitation. As is well-known, Ā-movement of the subject from a *for* clause requires *for* to be

82. As Idan Landau (personal communication) has pointed out, possible counterexamples to this claim might be *intend* and *mean*, discussed by Postal 1974, 178 ex. (215d,f). These verbs permit a *for*-clause complement and also, when passivized, permit raising of the embedded subject:

(i) a. Sue intended (for) there to be a chair on stage.
b. There was intended to be a chair on stage.
c. The police never meant (for) close tabs to be kept on Bill.
d. Close tabs were never meant to be kept on the suspect.

It is possible, however, that these predicates are ambiguous in a manner reminiscent of the ambiguity of *expect* discussed by Bresnan (1972, 162-165) — taking both *for*-clause like *want* as its complement in one guise, and a *that*-clause like *believe* and *seem* (pre-Exfoliation) in its other guise. Passive would be permitted only when the second guise is chosen. Though the judgments are extremely subtle, there may be a detectable semantic difference between infinitive complements to these predicates with and without *for*. The use of *for* appears to permit an indirect relation to hold between the actions of the higher-clause subject and the potential realization of the situation denoted by the complement clause. A complement without *for* is most felicitous denoting a situation over which the higher-clause subject has potentially direct control. Thus, (iib) below contrasts with (iia) because the framers of the American constitution lived long before Trump was born and therefore had no direct relation to any situation involving him. The use of *for* in (iib) permits an indirect relation to hold between the actions of the framers and situations involving Trump, while the absence of *for* in (iib) requires the possibility of more direct interaction. Crucially, the infelicity of (iib) appears to be inherited by the passive counterpart in (iic):

(ii) a. The framers of the American constitution never intended for Trump to be able to pardon himself.
b. #The framers of the American constitution never intended Trump to be able to pardon himself.
c. #(As for the framers of the American constitution,) Trump was never intended to be able to pardon himself.

missing: an effect that looks just like a complementizer-trace effect in a *for*-infinitival setting (i.e. a *"for*-trace effect") (Ross 1967, 445; Bresnan 1977, 171; Pesetsky and Torrego 2001, 394 ff.; Pesetsky 2017, 8 ff.):

(211) ***for*-trace effects (English)**

a. Mary, who Sue wants (a bit self-interestedly) (*for) ___ to win the prize, …
b. Who would you prefer (*for) ___ to meet Sue at the station?
c. John, who we would like (*for) ___ to listen to us for a change, …
d. Which package do you need (*for) ___ to be delivered quickly?

The explanation for this observation is less straightforward than it might appear, however. One might imagine that the extractions in (211) could be attributed to an Ā-probe on *v*. If this Ā-probe found the raised subject in specifier of FP, it would trigger Exfoliation of the *f*P layer, explaining the obligatory absence of *for* in the output. In the context of the theory developed here, we must indeed attribute the absence of *for* to Exfoliation triggered by a probe-goal relation between some higher probe and the raised subject in FP. However, it looks like the Ā-probe on *v* cannot be the probe in question, since the only higher predicates that permit Ā-movement of the raised subject as in (211) are those that independently permit R2, i.e. the W-verbs.

(212) **No Ā-extraction of embedded subject where higher predicate lacks the R2 probe (English)**

a. Sue demanded *(for) Mary to win the prize.
a′. *Mary, who Sue demanded ___ to win the prize,…

b. Bill is anxious *(for) John to meet Sue at the station.
b′. *Who is Bill anxious ___ to meet Sue at the station?

c. We would be happy *(for) John to listen to us for a change.
c′. John, who we would be happy ___ to listen to us for a change,…

d. You asked Bill *(for) the package to be delivered quickly.
d′. *Which package did you ask Bill [___ to be delivered quickly]?

We must therefore conclude that the only kind of probe that can extract the subject from an embedded *f*P and trigger Exfoliation is the R2 probe (limited to active verbs; cf. (35a)). Neither the R1 probe nor the Ā-probe on a higher head such as *v* or *a* in (212)) can do this.

Recall that the Kayne paradigm discussed in section 2.5.2 arose with predicates that take CP complements precisely because, even in the absence of an R2 probe, an Ā-probe (or R1 probe) on *v*, *a*, or *n* could extract the subject from the embedded clause, triggering Exfoliation down to the *to*P layer. In effect, what we are observing in (212) is the absence of the Kayne paradigm with predicates that take an *f*P complement.

The Kayne paradigm also reared its head in Romance languages like French in which verbs that bear an R2 probe in English lack this probe entirely. Nonetheless, we saw in (41), repeated as (213) below, that an R1 or Ā-probe on *v* could successfully extract the subject of an embedded clause, triggering an instance of infinitive-creating Exfoliation. As Pollock (1985, 309 and 314) notes, however, no such possibility is available for the French counterparts to the English W-verbs, as illustrated in (214):

(213) **Kayne paradigm with French verbs like 'believe' (= (41))**

a. **R2:**
*Je croyais cet homme être arrivé.
'I believed this man to have arrived.'

b. **Ā-movement:**
l'homme que je croyais ___ être arrivé…
the man that I believed AUX.INF arrived…
'the man that I believed to have arrived…' (cf. Kayne 1981, p. 357, ex. (65))

c. **passive:**
%Marie a longtemps été crue ___ avoir résolu ce problème.
Marie AUX.3SG long.time AUX.PTCP believed AUX.INF solved this problem.
'Mary has for a long time been believed to have solved this problem.'
(Pollock 1985, p. 307, ex. (56))

(214) **No Kayne paradigm with French W-verbs**

a. **R2:**
*Pierre a longtemps voulue Marie avoir résolu ce problème.
Pierre AUX for.a.long.time wanted Marie AUX.INF solved this problem
'Pierre wantedy Marie for a long time to have solved this problem.'

b. **Ā-movement:**
*la femme que j'aurais voulu ___ résoudre ce problème…
the woman that I.would.have wanted solve.INF this problem
'the woman that I would have wanted to solve this problem…'
(Pollock 1985, 314 adapted from (83))

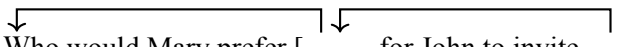
c. **passive:**
*Marie a été longtemps voulue ___ avoir résolu ce problème.
Marie AUX been for.a.long.time wanted AUX.INF solved this problem
attempt at: '*Marie was wanted for a long time to have solved this problem'
(Pollock 1985, 309 ex. (62), (63))

These observations suggest that for both English and French (at least), the following generalization obtains:

(215) ***f*P Exfoliation generalization**
Only a probe on the nearest head can trigger Exfoliation of *f*P.

The generalization has been stated as a restriction on Exfoliation, rather than a general restriction on probe-goal relations across an *f*P boundary, because successive-cyclic Ā-movement of a non-subject from a *for*-infinitive is possible. This means that a *f*P-external Ā-probe may attract a goal across the *f*P boundary, so long as Exfoliation is not triggered (i.e. so long as the goal occupies the edge of *f*P):

(216) **Edge of *f*P accessible to external probes**



Subjunctive clauses appear to obey this generalization as well, albeit more weakly for Ā-extraction of the subject. R2 leaving a subjunctive clause behind is completely impossible — perhaps as an instance of hyperraising, if FP headed by *that* (or *that*+F if *that* is a raised instance of C) counts as finite for the ban

on hyperraising in (172). Not only is R1 also impossible, but Ā-extraction of the subject with Exfoliation of *f* P is also felt to be deviant (though not as bad as failure to Exfoliate). The prefixed double question mark in (217a-b) below indicates this deviance, and the parenthesized star on *that* indicates further degradation (a complementizer-trace effect) when Exfoliation does not happen:

(217) **Complementizer-trace effect with subject extraction from subjunctive clause (English)**

a. ??The only person who it's not essential (*that) ___ talk to her is Bill.
(Kayne 1980, 77 ex. (25); Kayne stars the version without *that*.)

b. ??Who did Mary demand [(*that) ___ arrive on time]?

c. ??Mary, who we would prefer [(*that) ___ accept this solution],…

I have no explanation at present for why the *f* P generalization in (215) should hold, so it is possible that it indicates some deficiency elsewhere among our other proposals. I leave this as a topic for future investigation.

Our discussion of *for* lays the groundwork for a new approach to the syntactic side of control in the next subsection.

5.2 *P*RO as a consequence of agreement with *f*

It is highly unlikely that any reader of this work needs to be reminded that the proper analysis of control phenomena has been and remains a topic of considerable debate (Landau 2013). The short sections that follow do not even skim the surface of the phenomena that must be explained by an adequate theory of control. My only goal is a demonstration that the ideas developed in this work do not make it impossible to imagine skimming this surface (or better) in future work. To the extent that control in many languages is a phenomenon limited to non-finite clauses, the fact that we have posited Exfoliation as the sole means of deriving such a clause compels us to at least offer some comment concerning how the syntax of control might be approached under these strictures. We begin with some observations concerning NOC in English infinitival relative and interrogative constructions.

As noted in the previous subsection, the Exfoliation approach does not posit a crucial role for *for* in licensing the subject of the embedded clause, which is already licensed by T before Exfoliation applies in its original finite CP. Instead, *for* merely assigns a second case to the subject after it has moved from the embedded CP into the F/*f* domain. This property of the analysis has left unexplained a link between the availability of an overt subject and the overtness of *for* that provided one of several foundational empirical arguments for the development of Case Theory in the 1970s (Chomsky and Lasnik 1977, 460 ff.; Vergnaud 1976/2006, 23 ff.; Chomsky 1980, 28).

When an Ā-probe on *for* attracts and retains a *wh*-phrase in specifier position, the Exposure Condition renders *for* non-overt. When this happens, an overt subject becomes impossible. Significantly, in exactly these circumstances, the null subject traditionally notated as PRO becomes possible. In the infinitival relative clauses of (218a-d) below, the Exposure Condition requires *for* to be unpronounced, since it retains a *wh*-phrase as its specifier. Correspondingly, the subject may not be an overt nominal, but may be unpronounced PRO. The same is true in the infinitival questions in (218e-h). If we analyze the infinitival relative clauses in (218i-j) along the lines of our analysis of *that*-relatives in section 3.4.2 (as illustrated in (143)) then these examples show movement of the nominal *topic* triggered by an Ā-feature on *for* — but it is the raised nominal that projects, leaving *for* exposed and therefore pronounced. Once again there is a correspondence between the overtness of *for* and the overtness of the subject: overt *Mary* is possible, but silent PRO is not (though the second of these facts is dialect-specific, a point to which we return below).

(218) **Overt vs. non-overt *for* correlates with overt vs. PRO subject**

Infinitival relative clause with overt wh-phrase (for *not exposed*)

I'm looking for …

a. *…a topic [[on which] for Mary to work ___]	* (*violates Exposure Condition*)
b. *…a topic [[on which] $\emptyset_{for}$ Mary to work ___]	**silent* for*, overt subject*
c. *…a topic [[on which] for PRO to work ___]	* (*violates Exposure Condition*)
d.✓ …a topic [[on which] $\emptyset_{for}$ PRO to work ___]	✓*silent* for*, silent subject*

Infinitival question

I wonder …

e. *…[[which topic] for Mary to discuss ___]	* (*violates Exposure Condition*)
f. *…[[which topic] $\emptyset_{for}$ Mary to discuss ___]	**silent* for*, overt subject*
g. *…[[which topic] for PRO to discuss ___]	* (*violates Exposure Condition*)
h.✓ …[[which topic] $\emptyset_{for}$ PRO to discuss ___]	✓*silent* for*, silent subject*

Move-and-project infinitival relative clause

I'm looking for …

i. ✓ …a topic [for Mary to discuss ___]	✓*overt* for*, overt subject*
j. *…a topic [for PRO to discuss ___]	**overt* for*, silent subject*

In older theories that credit *for* with the licensing of the subject, it has been suggested that the absence of overt *for* deprives the subject of its only possible source of licensing. All versions of this proposal, however, come with additional baggage and issues. Chomsky (1980, 28), for example, suggested that when overt *for* is absent, it has not been inserted in the first place.[83] Consequently, there is no step in the derivation that contains *for*. If we are justified in attributing the modalized semantics of these constructions to *for*, it becomes problematic to assume that this lexical item is never inserted in the first place. Alternatively, we could imagine that is inserted but not pronounced, as in analyses of ellipsis — but this raises the question of why other case-licensers do not yield Case Filter violations when some syntactic process such as ellipsis silences them. For example, when an inflected verb is silenced by Gapping, this does not interfere with the licensing of either the subject or the object, nor does sluicing deprive a nominal *wh*-phrase remnant of its ability to pass the Case Filter.

The proposal I will advance here also comes with baggage, so I cannot claim that it is conceptually superior to alternatives, but I also do not believe that it is obviously inferior. I propose that the correct generalization concerns overtness directly: *f* bears a φ-probe with *an attribute that requires the bearer of the probe and its goal to match in overtness*, i.e. to agree in value for [±PRONOUNCE]. When a nominal is marked [-PRONOUNCE], it receives the "controllee" properties attributed by the literature to PRO, here understood as the set of rules that govern the semantic interpretation of an unpronounced nominal.[84] I will use the symbol ^ ("control") as a notation for this attribute:

(219) **The control (^) attribute**

A probe with the ^ attribute agrees in [±PRONOUNCE] with its goal.

In the constructions surveyed in (218), it is Ā-movement to *f* that causes *for* to be unpronounced. Recall that the Exposure Condition in its final form (108) is a biconditional. *For* should always be overt

83. More precisely, he describes such constructions as involving "the null COMP when the optional rule expanding COMP is not applied".

84. Obviously the interpretation of a null subject of a finite clause (*pro*) follows different rules in languages that have this option, and must therefore receive a different analysis. I will not explore this question here.

except when it retains a specifier. This raises a question concerning relative clauses like those in (220), which complete the paradigm of (218). These examples accord fully with the generalization that *for* and the subject must agree in overtness, but lead us to posit a retained specifier of *for*, in order to explain *for*'s non-overtness.

(220) **Overt vs. non-overt *for* correlates with overt vs. PRO subject [(218) continued]**
k. * …a topic [$\emptyset_{for}$ Mary to discuss ___] **silent* for*, overt subject*
l. ✓ …a topic [$\emptyset_{for}$ PRO to discuss ___] **silent* for*, silent subject*

I suggest that it is the raised subject itself that moves to the specifier of *for* in examples like (220l), in response to an EPP property of the ^φ-probe on *for*. Because the subject has raised to the specifier of *for* and remains there, *for* is silenced; and because the ^φ-probe on the silenced *for* has taken the subject as its goal, this specifier is itself silenced, i.e. behaves as PRO (as already posited).

We now examine how the proposal works in more detail. The following probes are present on *f* and F in (Standard) English:

- Both *f* and F have φ-probes that are optionally +EPP or -EPP.
- The φ-probe on *f* bears the ^ attribute (as discussed above), that requires *f* and the goal of its ^φ-probe to match in overtness.
- *F* also bears an Ā-probe (like *v*, extending the parallelism between the pairs *v*/V and *f*/F noted in the previous subsection).

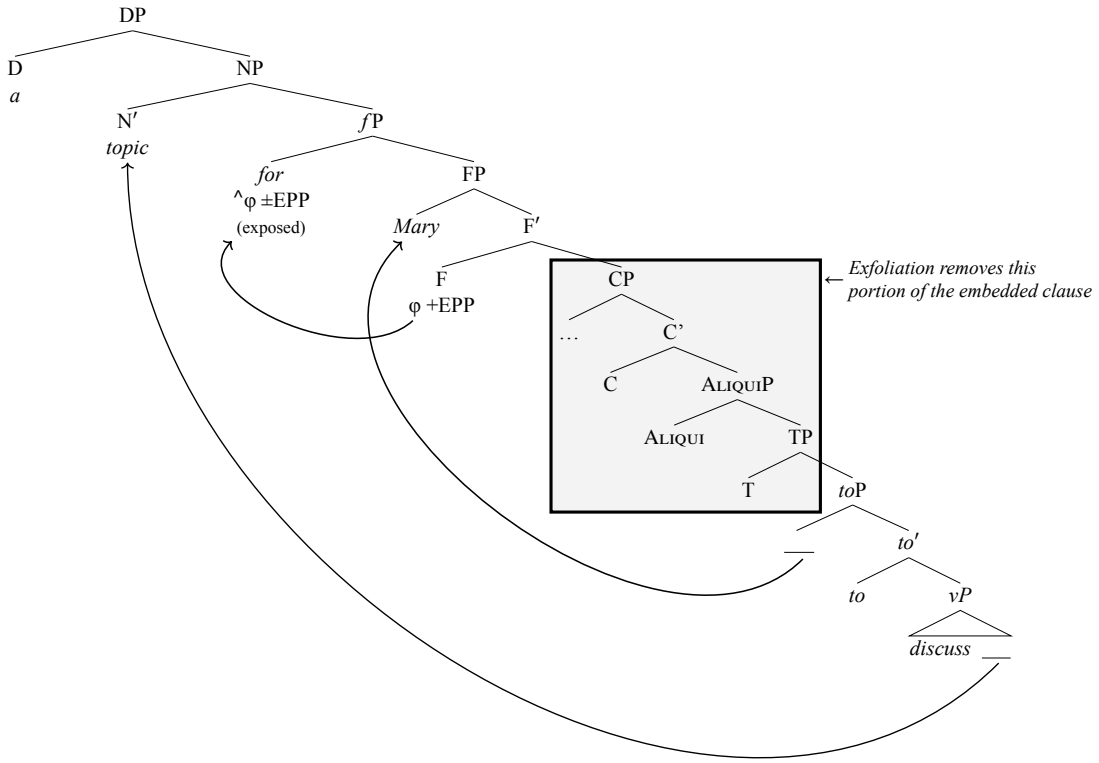
The ^φ-probe on *for* might also be responsible for the assignment of oblique case by *for* to the subject raised from the CP complement to form a specifier of F. Crucially, as already noted in the previous section, F (more precisely, the non-subjunctive allomorph of F) selects *to*P, which means that either:

1. F's φ-probe must be +EPP and attract the embedded subject; or
2. *f*'s ^ φ-probe must be +EPP and attract the embedded subject.

Let us consider each scenario in turn.

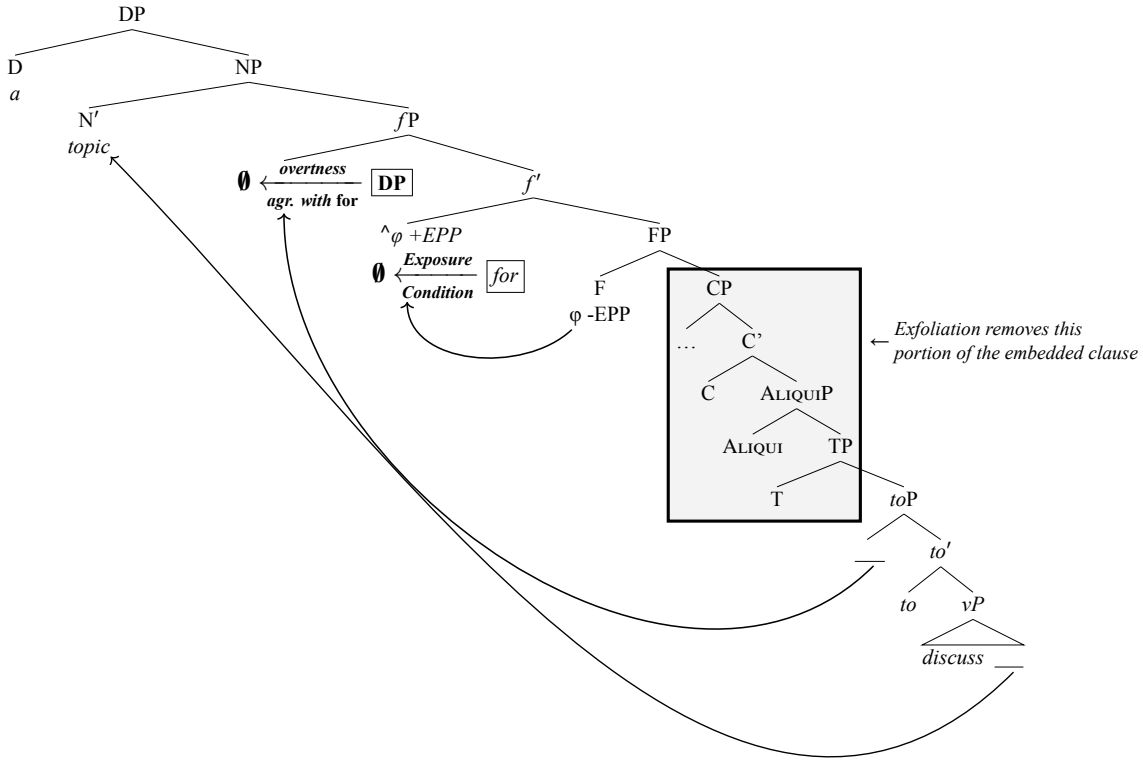
Scenario 1. If the φ-probe on F is +EPP, the ^φ-probe on *f* can be either +EPP or -EPP — since the choice will make no difference, given LAAC. ^φ on *f* will not be able to attract a goal from the specifier of FP regardless, as an antilocality effect of LAAC (since the goal will have raised to the specifier of F from the specifier of *to*P, and both positions are accessible to *f*). Since the EPP property of ^φ on *f* will not be satisfiable, the subject will remain in the specifier of F, and the result will be a clause with overt *for* — and therefore with an overt subject. This scenario covers simple examples like (189) as well as infinitival relative clauses with overt *for* such as (218i).

(221) **Analysis of (218i)**



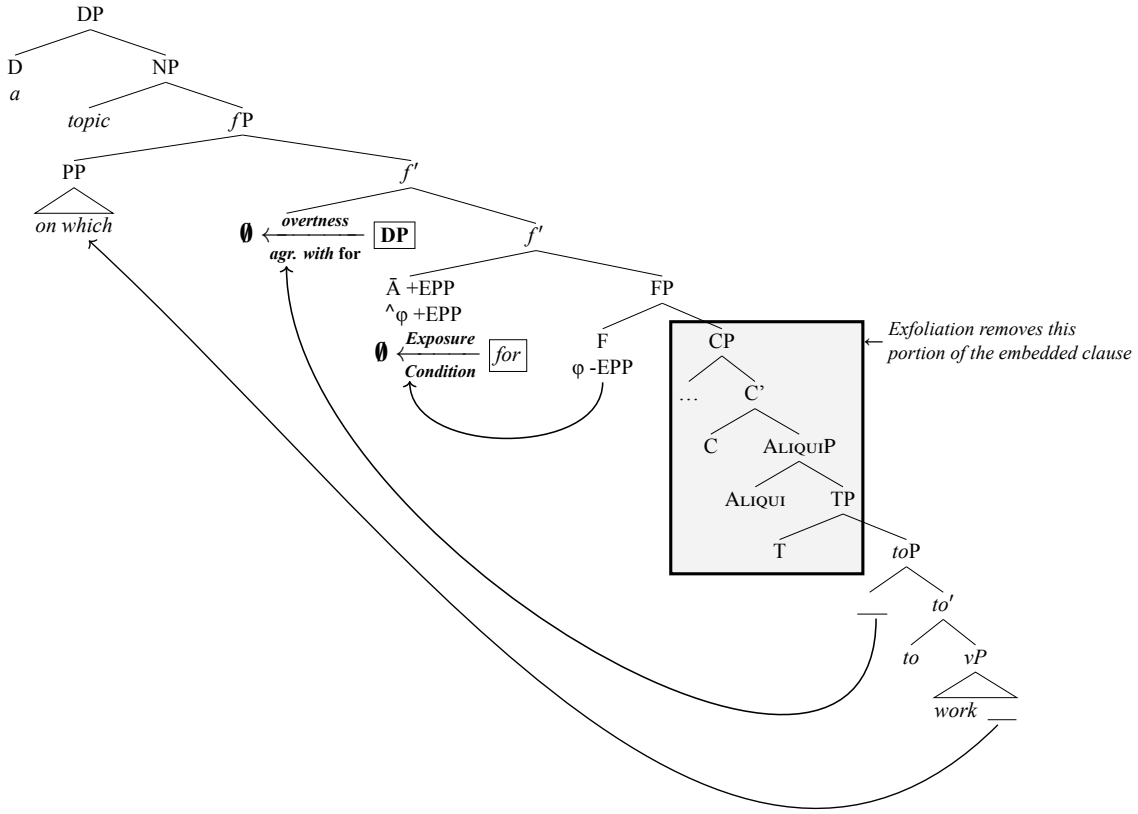
Scenario 2. If the φ-probe on F is -EPP and the ^φ-probe on *for* is +EPP, the subject will be attracted to *ƒ* directly from the embedded CP — triggering Exfoliation to the *to*P level, as required by the selectional properties of F. Because the subject is a retained specifier of *ƒ*, *for* will be silenced by the Exposure Condition, as will the subject (because of the ^ attribute). The result is a clause in which *for* is silent and the subject is PRO. This scenario covers relative clauses like (220l).

(222) **Analysis of (220l)**



In addition, if the Ā-feature on *f* successfully creates a retained Ā-specifier by moving a constituent other than the embedded subject, *for* will be silenced by the Exposure Condition, as will the subject, because of the ^ attribute on *f*'s φ-probe — regardless of the EPP value of the φ-probe on either *f* or F. All that is required is that one of them be +EPP — so the subject is extracted from its original location within CP, triggering the infinitivization of that CP by Exfoliation that F demands. This scenario covers infinitival relatives like (218d) and infinitival questions like (218h):

(223) **Analysis of (218h)**



What if the the Ā-feature on *f* attracts the local subject itself, and this specifier is retained? If the subject is an interrogative *wh*-phrase, there is no acceptable outcome. This is unsurprising, since the same element must also be the goal for the ^φ feature on *f*, and must therefore agree in overtness with *for*. Since the Exposure Condition silences *for*, the *wh*-phrase must also be silenced — which quite generally appears not to be an option for any interrogative *wh*-phrase, at least in English. For that reason, neither variant of (224) is acceptable.

(224) **No infinitival question from local subject**
* I wonder [(who) to discuss this topic].

Note that because the φ-probe on F does not have to bear the +EPP attribute, the explanation for why a clause with *for* semantics cannot support a local subject question cannot be the same as our explanation in section 4.2 for why a CP with a WP superstructure fails to support subject Ā-movement yielding an infinitive. It is possible that the need for distinct explanations for what seem like similar observations reflects some inadequacy in the proposals advanced here, but I will leave that possibility unaddressed.

If some other variety of Ā-movement contrasts with interrogatives in remaining untroubled if the Ā-element is silenced, it is predicted that infinitivizing Ā-movement of the local subject should be possible. This might in fact be the explanation for the existence of infinitival relative clauses in which the local subject is the relativized position (a problem for traditional Case Theory in a lexicalist context, since the trace of Ā-movement is not case-licensed in such examples; Chomsky 1981, 167):

(225) **Infinitival relative from local subject with silenced *for***
[Someone [$\emptyset_{who}$ $\emptyset_{for}$ to fix the sink]] would be useful right now.

This relative clause cannot be an instance of "move-and-project", or else we expect *for* to be overt, since it would be exposed. At the same time, if a move-and-project derivation is correct for examples like (220l), as diagrammed in (223), we expect it to be equally available when the relativized element is the local subject — contrary to fact in Standard English:

(226) **Infinitival relative from local subject with overt *for***
*[Someone [for to fix the sink]] would be useful right now.

I will leave the account of the badness of (226) open. One possibility is that the overtness agreement imposed by the ^φ-probe of *for* will apply to the highest trace of the moved subject in a move-and-project derivation, rather than to the moved subject itself. This could be attributed either to the phase boundary that intervenes between *for* and the head of the relative after it projects, or to the non-maximality of the moved element when it projects after movement.

Another possible example of infinitivizing Ā-movement of the local subject might be found in gapped degree clauses, which Chomsky (1977, 102) argued involve Ā-movement when the gap is not the local subject. Example (227a) shows this for an object gap, which can be embedded (but not below an island boundary) and can license a parasitic gap in an adjunct clause, generally viewed as diagnostic of Ā-movement. Following Chomsky, we posit a null element controlled by *this student* that has undergone Ā-movement to form a specifier of *for*. Example (227b), from Brillman (2017), shows a gapped degree clause in which the null element appears to have moved from the local subject position. As Brillman notes, the fact that this movement has Ā-properties is confirmed by the fact that it too may license a parasitic gap:[85]

(227) **Gapped Degree Clauses**
a. This student is too young for Mary to try to hire ___ [without us talking to ___ *pg* first].
b. ?This student is too young ___ to take the bar exam [without us talking to ___ *pg* first].
(Brillman 2017, 131, ex. (69a))

Since we independently know from constructions like (227a) that the moved element may be null (and in fact most often is) for other reasons, nullness enforced by agreement with the ^φ-probe on *f* is not expected to pose a problem — and, as Brillman's evidence suggests, it does not.

5.3 Extensions to NOC and OC

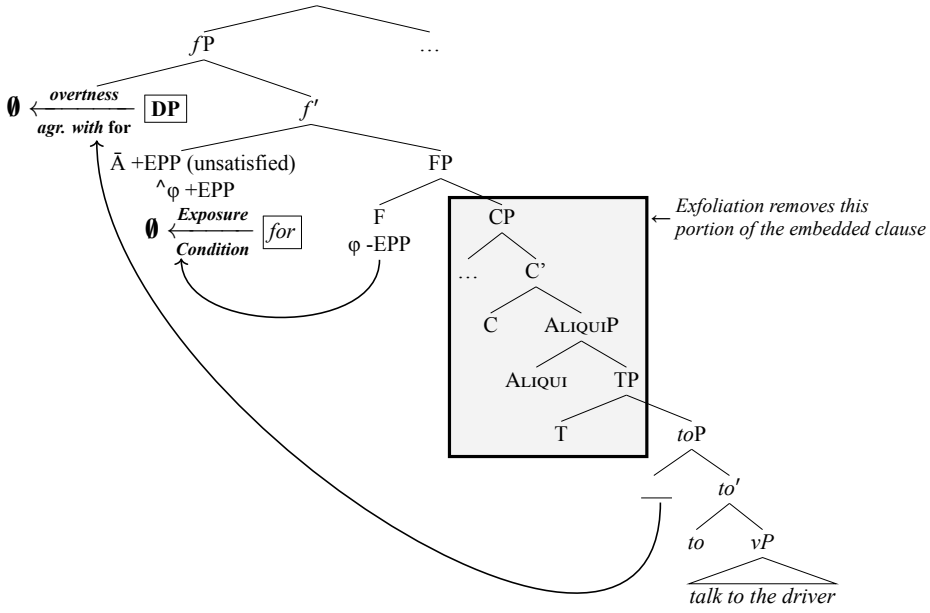
Crucial to our discussion of (220l) as diagrammed in (223) is the observation that movement of the subject to the specifier of *f*P renders both *for* and the moved subject null, to which was added the claim that a subject rendered null by its status as a goal for ^φ on *f* has the semantics of a controllee. This proposal extends beyond relative clauses and questions to provide a possible syntax for so-called *non-obligatory control* (NOC) in constructions like (228):

(228) **Non-obligatory control in clauses with the semantics of *for***
a. [PRO to take the day off] would annoy our boss.
b. [PRO to talk to the driver] is illegal.

It is conceivable that all instances of NOC can be analyzed in this fashion: as the consequence of raising the subject of a full finite CP to *f* in response to a ^φ feature universally present on this head:

85. As Brillman points out, example (227b) is perhaps not perfect, but contrasts favorably with subject-gap constructions where Ā-movement is not independently diagnosable, e.g. **This student is eager* PRO *to take the bar exam* [*without us talking to* ___].

(229) **The syntax of NOC: analysis of (228a)**



This proposal does not, of course, shed immediately light on other properties of NOC such as choice of controller and the semantics of the controlled element — but it does build on an independent evidence for overtness agreement between *for* and the subject to provide a niche for NOC in the theory.

An Exfoliation approach to NOC (and, as we shall see below, OC as well) resolves a long-standing puzzle that has been taken to concern the interaction of PRO with the theory of Case licensing. The limitation of PRO to the subject position of an infinitival clause and its general complementary distribution with overt nominals was often taken in work of the 1980s and 1990s to support a special exemption from the Case Filter for PRO (cf. Chomsky 1980, 27; 1981, 49) — attributed to different factors in different proposals. The background to the entire discussion, of course, was the lexicalist assumption that infinitival clauses are born, not made — and the further claim (made available by this assumption) that non-finite T differs from its finite counterpart in failing to assign case. Such proposals faced a challenge, however. Wherever such theories attributed obligatory or impossible A-movement by overt nominals to factors related to case, PRO shows the same behavior. If we use the binding-theoretic behavior of pronouns and reflexives, for example, as a probe for whether the embedded subject has raised in R1 constructions like those in (230a-b), it is clear that PRO raises just as obligatorily as overt *her*. Likewise, whatever factor blocks A-movement of the overt nominal from the object position of *to* in (230d) also blocks the comparable movement of PRO in (230c). If the relevant factor in (230d) concerns the case assigned to the two positions occupied by *her*, as argued by Chomsky and Lasnik (1995, 108 ff.), then once again PRO appears sensitive to case in a manner indistinguishable from overt nominals:[86]

86. It is crucial to the Exfoliation proposal that A-movement not be blocked from a NOM position, which means that we must reject any general claim that A-movement is blocked from case-licensed positions, as embodied in the "Last Resort" principle of Chomsky and Lasnik (1995, 108 ff.) or the Activity condition of Chomsky (2000, 123). If the generalization relevant to (230d) does concern case as commonly, one obvious distinction between A-movement movement from a NOM position (which must be permitted) and movement from any other case-marked position (which must perhaps be blocked) might concern the presence of a case feature. If only dependent and oblique case involve actual case features, then it is the presence of a case feature on an ACC or oblique nominal that might be taken to block movement to a distinct case position. This raises obvious questions concerning raising from ergative positions, which I will not explore here.

(230) **PRO behaves like other nominals with respect to movement and Case**

a. [PRO$_i$ to seem to ✓herself/*her$_i$ [___ to be running late]] would annoy our boss$_i$.

b. [For her$_i$ to seem to ✓herself/*her$_i$ [___ to be running late]] would annoy our boss$_i$.

c. *[PRO to seem to ___ [that the problems are insoluble]] would be sad.

d. *[For her to seem to ___ [that the problems are insoluble]] would be sad.

(Chomsky and Lasnik 1995, 108, ex. (314b))

Chomsky and Lasnik (1995, 108 ff.) respond to this puzzle by suggesting that PRO does receive case and must satisfy the Case Filter after all, just like other nominals. This explains why movement is obligatory or blocked for PRO in the same environments where it is obligatory or blocked for overt nominals. At the same time, they posit that PRO can only satisfy the Case Filter when it receives a special case limited to PRO, called *null case*, assigned by nonfinite T. Because only PRO can bear null case, overt nominals are excluded from the positions in which PRO may occur; and because PRO can satisfy the Case Filter only if it bears null case, PRO is excluded from the positions in which overt nominals may occur.

The present theory requires no such stipulation, and indeed does not face any puzzle concerning movement of PRO and case. Since infinitives are derived from full finite clauses by Exfoliation, and PRO is derived from a normal overt nominal by overtness agreement with *f*/F, we expect the behavior of both the nominal that ends up with the properties of PRO and the clause that ends up infinitival to be exactly the same as the behavior of nominals that never become PRO in clauses that never become infinitival. That is exactly what we observe.

I have cautioned that our proposals in this subsection do not constitute a full theory of NOC phenomena, but merely show that the theory offers an independently motivated niche for NOC. Is there also a niche into which the syntax of of *obligatory control* (OC) might fit as well? Let us consider two possibilities.

First, whenever the semantics of an OC complement suggests the presence of *for*, we might imagine that the the complement clause is essentially the same as that seen in (229) (with the same distribution of EPP on its probes, i.e. positive on *f*, and negative on F) — with the controlled subject null, and therefore susceptible to control, because it has silenced *for* and agreed with it in non-overtness.

Another possibility, however, is an analysis of OC along the lines of the *Movement Theory of Control* (MTC), according to which the embedded subject in OC constructions is moved to the position of its controller, and thus plays both the role of controllee and controller (Bowers 1973, 675 ff., 1981; Wehrli 1980, 115-131,1981; Hornstein 1999). As is well known, OC constructions in languages like English involve an embedded clause with properties strongly reminiscent of R1 and R2:

(a) The embedded clause is nonfinite.
(b) A gap occurs instead of an overt subject in the embedded clause.

On an Exfoliation approach to finiteness like that developed here, property (a) diagnoses extraction of the subject from its clause. This in turn makes property (b) unsurprising — but raises the question of where the subject has been extracted to and why. If the complement clause in a control construction starts its life as a full finite CP, some clause-external probe must be responsible for extracting the subject of this CP, triggering Exfoliation. This probe could be the ^φ-probe on *f* just discussed, but it could also be a distinct probe in OC constructions.

In OC, the gap in the embedded clause is controlled by an argument nominal in the embedding clause, yielding a structure that strongly resembles R1 or R2:

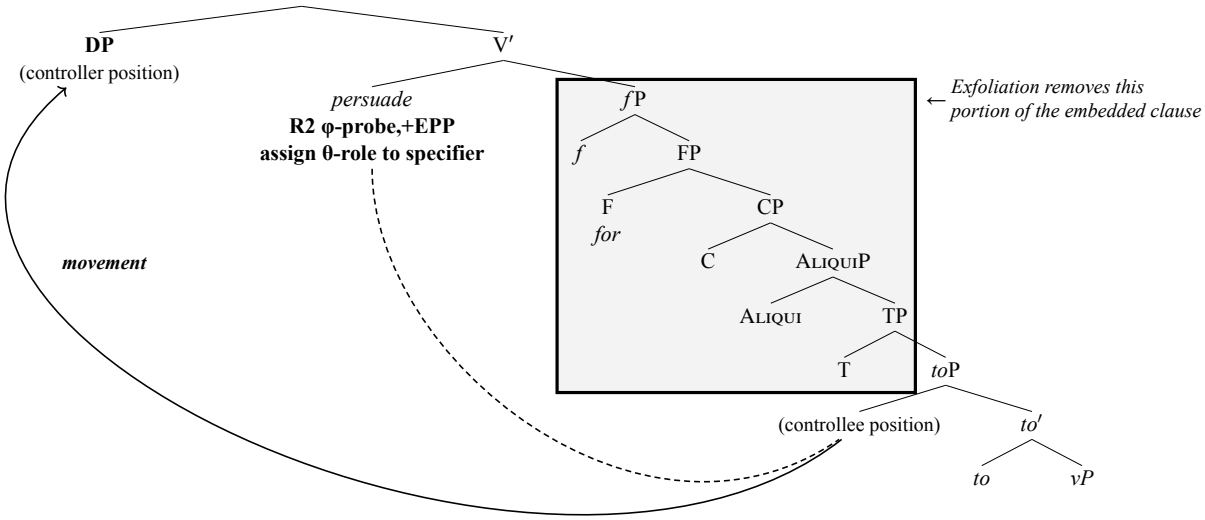
(231) **OC confusable with R1 or R2**

a. Mary persuaded Sue ___ to talk to me. *object OC like R2*

b. Mary condescended ___ to talk to me. *subject OC like R1*

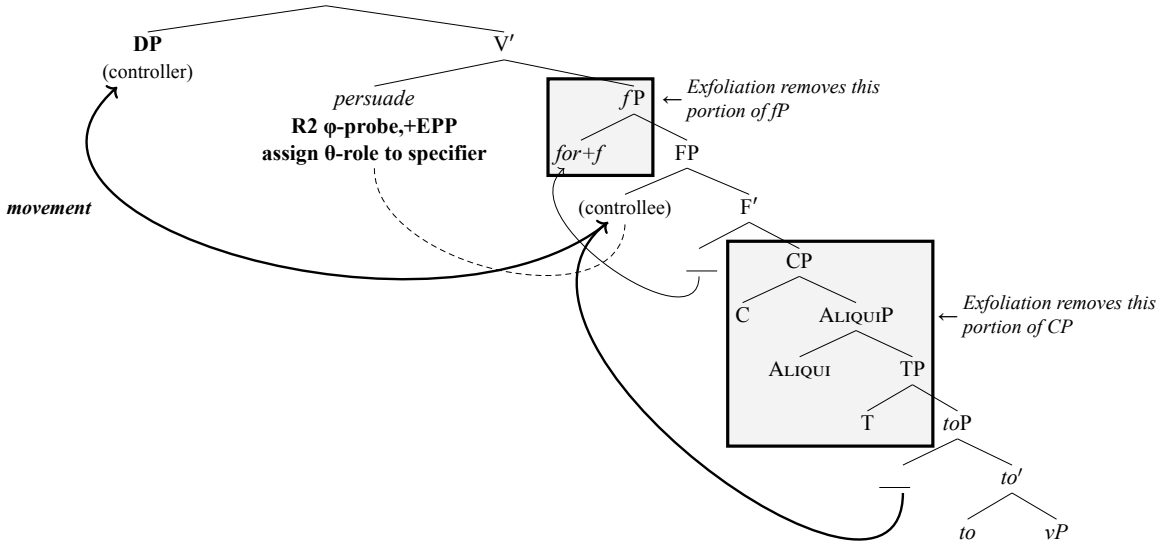
On an MTC approach to OC, object control truly is an instance of R2, and subject control truly is an instance of R1. OC differs from standard R1 or R2 only insofar as a second θ-role is assigned by a higher predicate to the raised nominal. In Hornstein's (1999) well-known version of the MTC, movement to the position of the controller is triggered by the θ-assigning property of the higher predicate itself — not the φ-probe responsible for traditional instances of R1 or R2. Levin (2018), however, argues for a simpler variant of the MTC approach, according to which it is a normal EPP attribute on a normal φ-probe that is responsible for movement of to the controller position. On Levin's variant of the MTC, the assignment of the second θ-role is simply a secondary consequence of movement to that position (an idea first suggested in a slightly different context by Zubizarreta 1982, 71 ff.). On this view, an object OC construction with a verb like *persuade* could be analyzed as the result of R2 movement of the embedded subject to the higher little V, where it receives a second θ-role — the derivation proceeding just as described for R2 in section 2.2 (with V-to-*v* movement placing the verb to the left of the raised nominal). The pre-Exfoliation complement of the higher predicate could be *f*P or CP, with the same outcome. The tree below displays this proposal for object OC, assuming that the subject has raised only as far as *to*P, and assuming that the complement of *persuade* starts life as an *f*P (plausible, given its irrealis semantics). The EPP feature of the φ-probe on F is unsatisfied in this derivation, but that creates no sensation of deviance once Exfoliation eliminates FP:

(232) **Object OC as R2 (on an MTC approach), controllee initially raised only as far as *toP***



An alternative derivation in which the controllee initially raises to the specifier of FP before moving to the controller position yields a homophonous output, and is worth noting for reasons discussed below:

(233) **Object OC as R2 (on an MTC approach), controllee initially raised to FP**



Similarly, subject OC in a verbal context could be understood as a response to a φ-probe on *v*, with an analysis identical to R1 except for the assignment of a second θ-role to the moved element.[87]

The case-theoretic properties of the controllee position in OC constructions are identical to those in (230a) and (230c) :

(234) **PRO behaves like other nominals with respect to movement and Case**

a. Sue persuaded Mary$_i$ [___ $_i$ to seem to ✓herself/*her$_i$ [___ to be running late all the time even when she really isn't (as a tardiness avoidance strategy)]].

b. *To cure himself of overconfidence, Bill tried [___ to seem to ___ [that the problems are insoluble]].

These facts are explained on a MTC approach, without any need to posit a special null case for PRO, in a manner familiar from our discussion of NOC above. Let us suppose that the gap in the controllee position is created by movement to the controller position. Before this step in the derivation, the controllee was a normal overt nominal that ended up in a subject position within a normal finite CP. It is therefore no surprise that its properties up to that point are identical to the properties of any other nominal in a finite clause.

The MTC approach, viable for OC but not for NOC, accords with a common view that the two phenomena are deeply different in some fashion — since the controllee gap in subject position is due to distinct factors in the two construction types (if we adopt MTC for OC, but movement to *f* for NOC). In OC on an MTC approach, the subject is silent because it is a trace of overt movement. Consequently, we are not surprised to find the subject position occupied by an overt element when movement to the second θ-position is covert, as in "backward control" (Polinsky and Potsdam 2002). Backward control is unexpected

87. Apparent OC is also possible in English in constructions where the controller is clearly the complement of a preposition, e.g. *Sue shouted* [*to the children*$_i$] [___ $_i$ *to behave themselves*]. If we posit a MTC analysis of such cases, then we must countenance "undermerge" raising to the complement of P — a conclusion relevant to the analysis of the constructions discussed in section 5.1.2(especially the final paragraph). If we adopt an analysis like (229) for OC, of course, no such issues arise.

in NOC as analyzed here, however — a prediction that appears to accord with the cases reported in the literature.[88]

Finally, it is important to note that OC is also found with factive and implicative predicates whose complements lack the characteristic semantics of *for*-infinitivals (i.e. lack the meaning associated with WOLL; Wurmbrand 2014). An MTC approach might analyze such predicates along the lines of R1 and R2 with verbs like *seem* and *believe*, as involving CP complementation without an *f* P superstructure. Alternatively, a superstructure with distinct semantics can be envisioned. A non-MTC approach along the lines of (229) could adopt the latter strategy as well.

Which of the possible analyses of OC, the MTC approach or one more like (229), offers the correct analysis of OC with predicates like *persuade*? We may leave this question open for now, but we should not leave the topic without noting that the two possibilities might coexist, describing distinct variants of OC. Such a proposal has recently been suggested in an Exfoliation setting by Sheehan and Hartmann (2020), with evidence from the much-debated interaction of case agreement and control in Icelandic.

Building on much preceding work, Sheehan and Hartmann note the existence of two distinct patterns of agreement with the subject within a control clause: *case independence* and *case* transmission. The two patterns can be distinguished when the controller is an ACC object. When case transmission is observed, elements within the nonfinite that agree with the subject show ACC morphology, like the controller of that subject. When case independence is observed (and the verb of the embedded clause does not require a quirky subject), these elements show NOM morphology.

(235) **Case transmission vs. case independence (Icelandic)**

a. Ég bað hanni [að fara einan þangað] *case transmission*
I.NOM asked him.ACC to go alone.M.SG.**ACC** there

b. Ég bað hanni [að fara einn þangað] *case independence*
I.NOM asked him.ACC to go alone.M.SG.**NOM** there
'I asked him to go there alone.' (Thraínsson 1979, 301, *per* Sheehan and Hartmann 2020)

As Sheehan and Hartmann note, the transmission pattern with ACC agreement is what one expects from a MTC derivation in which the subject of the embedded clause raises to object position within the higher VP and receives ACC there. Under the copy theory of movement, the raised nominal now occupies positions in both clauses, and since it is marked ACC will trigger ACC agreement in both clauses as well. This result is common to all theories that countenance the MTC. Some but not all speakers permit a similar case transmission pattern when the controller position mandates quirky DAT or quirky ACC case, as Sheehan and Hartmann also note.

Particular to the Exfoliation approach, however, is the prediction that a non-MTC derivation like (229) will produce NOM agreement in the embedded clause (assuming that no new case is assigned to the controlled silent nominal — as discussed by Sheehan and Hartmann, and as pointed out to me by Shrayana Haldar (personal communication). The subject nominal receives NOM in the embedded clause when it is still a full and finite CP. When it raises from CP into the *f* P domain, Exfoliation strips away the portion of

88. Haddad (2011) reports backward control (and "full-copy control") in an Assamese adjunct-like construction (the "conjunctive participle clause") that clearly fails to resemble the complementation configurations more commonly discussed as OC — but nonetheless shares with such configurations the OC-like property of obligatory co-interpretation of two positions. Backward control is found in Assamese when what would otherwise be a null controllee position within the adjunct clause needs to bear non-nominative case morphology. This is a property shared cross-linguistically by many constructions that clearly involve movement (e.g. Slavic relative clauses with non-overt *wh*-phrases; Hladnik 2015), and therefore might receive a MTC analysis, as Haddad suggests.

the tree that included finite T, but NOM remains the case of the controlled nominal and its traces, triggering NOM morphology on any element within the embedded clause that agrees with it.

Sheehan and Hartmann support this analysis of the two patterns by noting that partial control is compatible only with the case independence pattern. In (236) below, the middle-voice verb *meet* requires a collectivity as its subject. If the subject of the embedded clause is not a lower copy of *Ólaf*, but an independent nominal referring to Olaf and one or more others, its semantic requirements have been met.[89] If it is a lower copy of *Ólaf*, the collectivity requirement should not be met. Thus a mixed view, according to which both analyses are available for at least some instances of OC, is supported — as is the Exfoliation setting in which I have couched these analyses here.[90]

(236) **Partial control → case independence (Icelandic)**

a. *Hann bað Ólaf [að PRO_{i+j} hittast eina] *case transmission*
he.NOM asked Olaf.ACC AÐ meet alone.M.PL.**ACC**

b. ✓Hann bað Ólaf [að PRO_{i+j} hittast einir] *case independence*
he.NOM asked Olaf.ACC AÐ meet alone.M.PL.**NOM**

'He asked Olaf to meet alone.PL.' (Sheehan 2018, 149, *per* Sheehan and Hartmann 2020)

An extremely important final task, which I also leave for future research, concerns variation in the syntax of the various constructions discussed in this chapter. At a minimum, we should hope that sensible tweaks in tweakable aspects of the proposals advanced here can model correctly the variation that is observed (and in the ideal case, these tweaks would be predictable from other properties of the languages in question), but this is not a result that I can report at the present time. A few examples may illustrate the possibilities.

Consider again the variant of the MTC approach to object OC sketched in (233), and consider what would change if *for* did not move to *f* in a language otherwise identical. In English, on this derivation, *for* is unpronounced in its original position as the head of FP because it is a trace of overt movement, and is unpronounced in its higher position because *f*P is removed by Exfoliation. If the counterpart to *for* did not move in some language, in a derivation otherwise identical, it would be pronounced in situ — since it does not retain its specifier. This could be the proper analysis of clause-introducing particles in OC constructions such as French *à* or Dutch *om* that are traditionally classed as complementizers (with selection for post-Exfoliation FP vs. *to*P accounting for apparent language internal variation, including occasional optionality, in the use of these elements):[91]

89. Proposals have been offered that might permit partial control to arise under the MTC. Rodrigues 2007, for example, proposes that movement to the controller position may strand a null associative marker akin to Japanese *-tati* that provides the additional referents. Sheehan and Hartmann's argument depends on silent strandable material of this sort being unavailable, at least in Icelandic — and indeed, it remains a puzzle for analyses such as Rodrigues' why such a silent associative marker should be unavailable to normal overt nominals, which would permit **Olaf met* in addition to *He asked Olaf to meet*.

90. As is well-known, when the controlled position in the embedded clause requires a quirky case, no case transmission pattern is observed in the embedded clause, and the controller position never bears this case. This suggests, as Sheehan and Hartmann note, that movement from a θ-position associated with a particular case cannot target a distinct θ-position, eliminating the MTC derivation and permitting only the case-independent possibility in (229). The Exfoliation approach is compatible with this aspect of their analysis, but is not supported by it over alternatives.

91. Rizzi (1997, 228) observes that comparable elements such as Italian *di* appear to be located in a lower position than the normal indicative complementizer — because left-dislocated phrases precede these elements, but follow the indicative complementizer. Unless the indicative complementizer is located in a position analogous to *f*, this claim is not compatible with our proposal concerning such elements. One alternative might identify elements like *di* with *to* rather than C of F, but this leaves unexplained their general incompatibility with R1 and R2 with verbs such as *believe*, which motivated Huot (1981) and Kayne (1981) to identify them with a position higher than the position of English *to*.

(237) **Clause-introducing particles in OC: instances of F when F does not move to *f*?**
Marie a persuadé Jean **de** partir.
Marie AUX persuaded.PTCP Jean DE leave.INF
'Marie persuaded Jean to leave.'

Alternatively, imagine a language identical to modern Standard English (including overt movement of F to *f*) except that the ^ attribute on *f*'s φ-probe is optional. This would permit a subject to be attracted to *f*, silencing *f* by the Exposure Condition without being silenced itself. McFadden (2012) notes that Middle English (ME) permitted what look like Modern English *for*-clauses with an overt subject, except that no *for* is pronounced — which might instantiate this option:

(238) **Middle-English *for*-infinitives without overt *for***
a. The thridde grevance is [a man to have harm in his body].
'The third grievance is for a man to be bodily injured.' (CTPARS, 310.C1.941)
b. [A man to pride hym in the goodes of grace] is eek an outrageous folie.
'For a man to pride himself in the gifts he has received by grace is also an outrageous folly.'
(CTPARS, 302.C2.562) (McFadden 2012, 137, ex. (13),(14a))

The option under which the ^ attribute is present would silence the moved subject, yielding NOC constructions like those of modern English.

In Belfast English, as described by Henry (1995, 81-104), *for* is possible in environments where Standard English never tolerates *for*: the complement to R1 verbs such as *seem* and R2 verbs such as *believe*. But with these verbs it is only found in constructions that actually show R1 and R2 movement, and follows the raised subject, so this use of *for* is clearly limited to derivations that involve Exfoliation down to the *to*P layer:

(239) ***for* with R1 and R2 in Belfast English**
a. John seems for to be better.
b. *It seems for John to be better.
c. I believe them for to have done it.
d. *I believe for them to have done it. (Henry 1995, 86, ex. (27)-(28)

Henry argues that Belfast English *for* in constructions like these is an instance of C that has lowered so as to cliticize to *to*. Her argument that it is an instance of C rests on its complementary distribution with *whether* (which Henry independently argues is an instance of C in Belfast English). She also notes that *not* always follows and never precede*s for to* (unlike its behavior with bare *to*). One possible adaptation of Henry's proposal to an Exfoliation context might analyze *for* as an allomorph of *that* that optionally lowers to *to* (in the spirit of Henry's proposal) — but subject to the condition that it be clause-initial post-Exfoliation. The (b) and (d) examples of (239) are then blocked as instances of illegal Exfoliation (since the subject has not been extracted) and illegal use of the *for* allomorph (because it has not lowered).

Both Belfast English and Middle English (along with other contemporary) dialects also permit overt *for* to co-occur with NOC with the semantics associated with *for* in Standard English (as far as I can tell). One might imagine that this too instantiates a lowered cliticized instance of *for* — this time lowering from *f* rather than C.

This discussion does not, of course, constitute an exhaustive or thorough account of any of this variation. In this subsection, I have merely noted some approaches one might investigate — leaving this topic (along with many other much-disputed questions concerning control) for future work.

5.4 A superstructural analysis of English gerunds

I have argued that all clauses begin as full and finite CPs, and end up smaller than that only as a consequence of extraction-triggered Exfoliation. The empirical force of this claim, of course, depends on the specific set of clause types that we identify as involving nothing more than full and finite clauses from which one or more outer layers of structure have been subtracted. I have argued that non-finite complements in R1 and R2 constructions fit that description. More controversially, I have argued for the same treatment of finite clauses without an overt complementizer, including clauses introduced by (what I have identified as) an overt ALIQUI morpheme and examples of anti-agreement.

At the same time, I have argued that, despite the dependence of clause reduction on extraction, particular clause sizes may also be selected for, functioning as a filter on specific instances of Exfoliation or non-Exfoliation. As I cautioned in the final paragraph of chapter 1, selection (whether purely syntactic or derivative from semantic factors) is therefore not a "bad guy" in the Exfoliation narrative — despite our broader argument against lexicalist alternatives that also rely heavily on selection. Attention to selection appears inescapable if we are to model the ways in which clause size varies across languages and across environments within individual languages (though a better theory than ours might derive these selectional properties from more general properties of the languages in question).

Crucially, our account of certain specific clause-types, while embedded in our general theory of clause size, has also featured an indispensable lexicalist component. Some clauses do differ from normal finite CPs in more than just size. The central claim of this work, however, is that these differences involve superstructures *external* to a finite CP core — and to the extent that this core does not appear to be a full and finite CP, that is a consequence of Exfoliation. For example, the properties of overt *wh*-movement in certain languages motivated a superstructure above CP headed by an element that we called W, which present in some but not all *wh*-constructions. Likewise, irrealis infinitivals and some subjunctive clauses appeared to involve a FOR/*for* superstructure built above CP. This latter proposal was supported by the fact that the meaning of the lower portion of these clause does appear to be indicative and non-irrealis, with the irrealis component arising at a higher level (as revealed by the relative clause stacking test in (194) and related discussion). Our proposals concerning WP and *for* can in fact be viewed as updates of some of the most significant proposals advanced by Bresnan (1972) in defense of her completely lexicalist approach to clausal differentiation. In this work, we have not overturned the proposition that *some* distinctions among clause-types are matters of lexical choice, but have merely argued against the proposition that *all* clause-type distinctions treated as lexical in the literature of the past several decades are lexical in nature.

At the same time, though our proposals do retain elements from the lexicalist approach, they crucially rely on the derivationalist alternative as well. For example, though we accepted and built on Bresnan's conclusion that the use of English *for* is a matter of lexical choice, the fact that the complement of *for*/FOR is infinitival is a consequence of Exfoliation, reducing a finite CP complement of FOR to a *to*P in the same manner familiar from standard R2 constructions. Likewise, the complement to WP (where it occurs) was argued to be a bare CP, reduced to a smaller clause when the subject is extracted — an analysis that worked in tandem with language-specific selectional properties to explain the distribution of doubly-filled COMP phenomena.

Superstructures have been invoked in this work on an "as needed" basis, which is obviously unsatisfactory in the long run. What possibilities are available to languages in general, and what laws (if any)

govern their usability in particular languages and particular environments? The development of a general theory of such superstructures is a project for the future. The purpose of this section is to note a few other problems that might be addressed in this domain.

One area for which superstructures may be relevant cross-linguistically consists of so-called "mixed" categories, such as the English gerund. English ACC-*ing* gerunds have the external syntax of nominals (including the possibility of coordination with a DP; cf. (240a)), but the internal syntax of a nonfinite clause:

(240) **ACC-*ing* gerunds (English)**

a. Sue remembered both **there being a mailbox on this corner** and your hesitation about **Mary sending her letters from there**.

b. **Mary and Bill knowing the answer to the teacher's question for once** was a real surprise for us.

The *-ing* morpheme found in the English gerund also appears in other environments, which may give a clue concerning the correct analysis of its use with gerunds. With certain R1 and R2 predicates *-ing* appears to be an idiosyncratically selected affixal allomorph of *to*:

(241) ***-ing* selected by R1 and R2 predicates (English)**

a. There kept being reasons to not leave on time. (*R1*)

b. Close tabs ended up being kept on the wrong person.

c. The shit began hitting the fan late that afternoon.

d. We heard it (with our own ears) starting to rain just now. (*R2*)

e. John saw very close tabs (with his own eyes) being kept on several suspects.

f. The media kept the shit (with the vast power at their disposal) hitting the fan all summer.

We may analyze the syntax of these examples as identical to instances of English R1 and R2 with infinitival complementation, except for the idiosyncratic selection of the affixal allomorph of *to* by the higher predicate. The complements of the higher predicates are initially merged as full finite CPs that undergo Exfoliation down to the *to*P layer for all the usual reasons, with selection requiring the use of the *-ing* allomorph of *to*.

The *-ing* morphology selected by *from* with English "verbs of negative causation" (Postal 1974, 154 ff.) in constructions like (242) can be given a similar analysis, if the preposition bears an R2 probe (with subsequent movement of P to *p*) or an R1 probe (with subsequent R2 raising into the higher verbal domain) — so long as *from* itself is taken to select *-ing*:[92]

(242) ***-ing* selected by *from* with verbs of negative causation (English)**

a. This line of code prevents there from being multiple answers to any of the questions.

b. Someone should stop it from raining on our picnic.

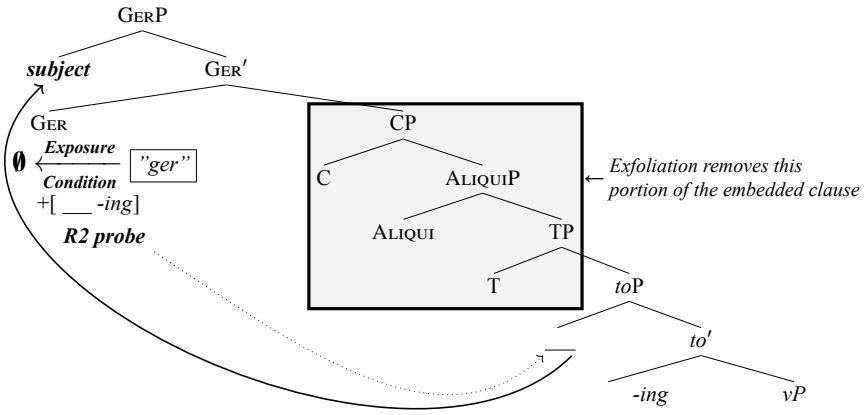
c. Only our indecision kept the shit from hitting the fan that day.

These possibilities suggests a similar analysis for ACC-*ing* gerunds like those in (240), positing a nominal superstructure headed by a species of D that we can call GER. GER bears a φ-probe that triggers raising

92. Postal (p. 159 fn. 55) claims that passive cannot further raise the subject of the embedded clause in such constructions, starring examples such as *There was prevented from being a riot* — which might argue against analysis in which the embedded subject ends up within probing range of an R1 probe on the higher passive *v.* I do not agree with these judgments, and will therefore leave the question of movement into the higher verbal domain open.

of the subject of the embedded clause, motivating Exfoliation, and selects for the *-ing* variant of *to*. The embedded subject is case-licensed pre-Exfoliation, thus resolving a perennial question concerning this construction (Reuland 1983; see Pires and Milsark 2017, 15 ff. for a survey of proposals). GER is unpronounced as an instance of the Doubly Filled COMP effect, due to the Exposure Condition (and the optional addition of "^" to GER will yield the possibility of control rather than an overt subject, also a possibility for English gerunds):[93]

(243) **Exfoliation triggered by R2 probe on GER**



Familiar evidence that the subject has indeed raised to a CP-external position comes from the impossibility of higher adverbials to its left:

(244) **Adverbials may not precede subject in ACC-*ing* gerund (English)**

a. Sue remembered (*sometimes) Bill (✓sometimes) arriving on time.

b. They told us about (*surprisingly) Mary and Bill (✓surprisingly) knowing the answer.

I will leave for future research the possible extension of this approach to other "mixed categories" such as participles, absolutive constructions, and other configurations that might be amenable to a similar analysis.

93. Alternatively, the gerund layer might consist of two heads GER and *ger*, with GER moving to *ger* and bearing an R1 probe, on the model of our analysis of *for*. I do not have evidence distinguishing these hypotheses.

Chapter 6

Passive as Exfoliation of *v*P?

In the initial chapters of this work, I presented a number of arguments favoring a derivationalist approach to clause size over the lexicalist alternative that has dominated discussion since Kiparsky and Kiparsky (1971) and Bresnan (1972). These arguments focused first on R1 and R2 configurations, as well as their interaction with Ā-movement; and then turned to complementizer-trace effects, as they arose with both Ā and A-movement. Among the many questions that arise from this work, one salient question concerns the generality of Exfoliation. In particular, does Exfoliation remove layers of other phases, such as *v*P, in circumstances analogous to those that remove clausal layers in the constructions discussed here? The answer should be yes, and there are possible examples.

One possible instance of Exfoliation at the *v*P level might be the passive construction, which Müller (2016; 2017, 8 ff.) has argued involves "structure removal", an operation similar, though not identical to Exfoliation. Müller's notion of structure removal differs from Exfoliation mainly in its distinct assumptions concerning the trigger for structure removal (as briefly discussed in the concluding paragraph of section 2.3). Consequently, many analyses rooted in Müller's overall approach can probably be imported and adapted into an Exfoliation framework, preserving all or most of their achievements (while interesting questions might well arise from the differences that motivate adaptation in the first place). In the domain of passive, the most obvious adaptation of Müller's proposals also serves to show how Exfoliation might function in non-clausal domains.

At the heart of Müller's proposal is the familiar observation that passive in a language like German or English may involve an implicit, phonologically absent external argument that is nonetheless syntactically active for certain processes, as illustrated in (245). As Müller points out, the processes that can access an implicit external argument all involve positions lower than the canonical location of the agent in an active sentence. He calls this property *downward accessibility*:

(245) **Downward accessibility of an implicit external argument**
(adapted from German examples in Müller 2016, 2-3)

a. *Control into adjunct infinitive*
The ship was sunk [in order ___ to collect the insurance].

b. *Control into secondary predicate*
The handout was written [___ tired].

c. *Obligatory control into argument infinitive*
It was decided [___ to leave].

d. *Binding of reciprocal*
(?) Even though this was a heartbreaking time [for my parents], much comfort was given to each other. (https://sasses.net/tag/prayer/, accessed March 16, 2019)

e. *Principle C*
Mary was seen in the mirror.
(* *if the only seeing event involved Mary seeing herself*)

Crucially, however, an implicit external argument is not accessible to processes that involve positions higher than the canonical location of the agent — an observation that Müller calls *upward inaccessibility*.

(246) **Upward inaccessibility of an implicit external argument**
(adapted from German examples in Müller 2016, 4-8)
a. **Binding by a higher quantifier*
No woman$_i$ admits that the book was stolen. (≠ ... *stolen by her*$_i$)
b. **Control by a higher nominal*
Mary hopes [___ to be decided to leave]
(*intended meaning*: 'Mary$_i$ hopes that it will be decided by her$_i$ to leave])
c. *No blocking of cross-clausal reflexive binding*
✓Mary$_i$ considers herself$_i$ to have been criticized.
(*compare*: 'Mary$_i$ considers Bill to have criticized herself$_i$]

Also falling under the rubric of upward inaccessibility for Müller is the fact that the implicit agent cannot satisfy positional EPP-type requirements imposed by higher heads (such as the requirement that the specifier of CP be filled in a German verb-second clause).

Müller proposes that these contrasts are teaching us that when a passive clause is built, the external argument is merged in its normal position, where it is available for processes such as binding and control — for as long as it is present. At a very slightly later point in the derivation, however, it is removed, rendering it inaccessible for any later process. The contrast between downward accessibility and upward inaccessibility thus arises directly from the rule of structure removal applying in the midst of an otherwise structure-building derivation.

As discussed in the final paragraphs of section 2.3, Müller proposes that each head H bears an ordered stack of features that guide the Merge and Remove operations that build the maximal projection of H. Structure removal occurs in Müller's framework when a head H that bears a feature motivating Merge of some constituent α with H also bears a feature motivating Removal of α from H. To build an active *v*P, a *v* is chosen whose stack contains a feature motivating Merge with VP and a feature motivating Merge with an external argument DP, in that order. As a consequence, *v* merges first with VP, creating a head-complement configuration, and the resulting *v*′ merges with a DP, creating (in effect) a specifier-head configuration. To build a passive clause, a feature is added to *v* that removes a DP, higher in the stack than the feature that motivated its merger in the first place. In the derivational interval between the merger of this DP and its removal, binding and control relations like those in (245) may be established and licensed (or blocked, in the case of (245e). By the time the higher quantifiers, controllers, or antecedents relevant to (246) are merged, the external argument of the lower *v*P is no longer present, and therefore unavailable for binding or control (or any other process).

These achievements can be imported in to an Exfoliation approach without Removal features if passive can be claimed to involve a relation between a *v*P-external φ-probe and the highest internal argument within *v*P that motivates Exfoliation of the *v*P layer — and if passive morphology is a concomitant of this configuration, as in Müller's approach. The most straightforward adaptation would posit (1) a Voice head external to *v*P that bears the crucial φ-probe and an EPP property; (2) some reason why in a passive construction this probe skips the external argument; and (3) a reason why the goal found by the Voice head cannot move via a specifier position of *v*P. Under these circumstances, extraction of the goal of this φ-probe will trigger Exfoliation of the *v*P layer.

Let us tackle (1) and (2) first. Let us propose that the φ-probe on Voice seeks an goal that is not assigned oblique case by a P or in any other fashion. Let us imagine further that the external argument of *v*

may be Merged as either a normal DP or as a *by*-phrase whose DP counts as oblique. If the former option is taken, Voice will attract the specifier from the edge of *v*P, not triggering Exfoliation. If the latter option is taken, however, Voice will skip the specifier and will find the highest argument within VP, which does not occupy the edge of its phase. If (3) (to which we turn shortly) is correct, this will trigger Exfoliation of *v*P.

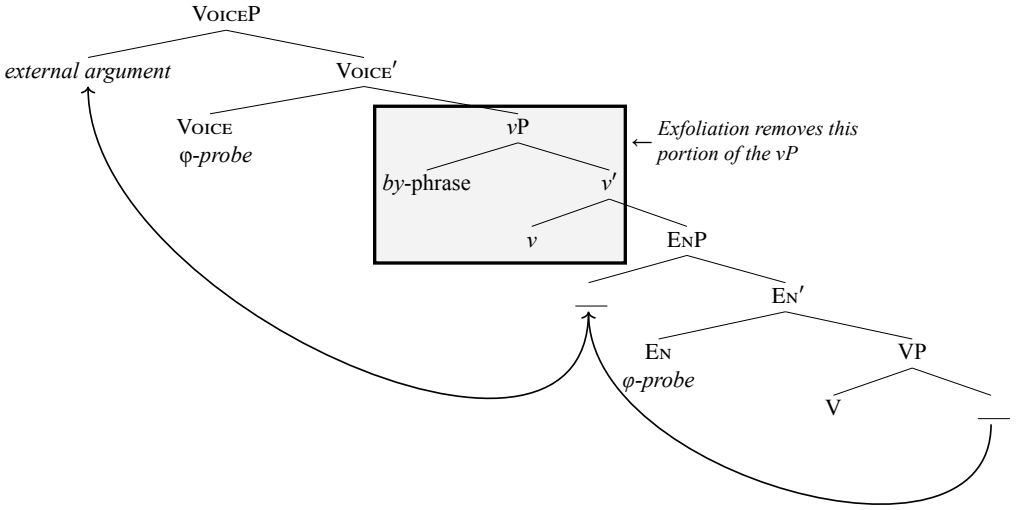
What happens to the oblique external argument when *v*P is Exfoliated? In section 2.4.5, we saw that when XP is removed by Exfoliation, its former specifiers may reattach to the structure that remains. We suggested in particular that these elements reattach as specifiers of the subconstituent that replaces XP (here deviating from Müller's solution to the same problem; see footnote 18). We also noted that reattachment, though required in certain instances, could be regarded as formally optional. We can then view the removal of the external argument described by Müller as a consequence of taking the non-reattachment option. If the reattachment option is taken instead, the result is an overt *by*-phrase, attached as a dependent of VP.[94]

Let us now turn to (3), and ask why Exfoliation must take place when a *by*-phrase has been merged — that is, why the argument that does raise in passive cannot move first to the edge of *v*P, obviating the need for Exfoliation. Since the sole argument of an unaccusative verb in a language like English must raise to T via the specifier of *v*P (given Phase Impenetrability and the apparent absence of *v*P Exfoliation), we know that *v* bears a φ-probe with an EPP property, so it cannot be the absence of such a probe that prevents similar raising in a passive construction. Consequently, it must be an anti-locality effect that prevents movement through the specifier of *v*P in the passive construction. If anti-locality effects follow from LAAC, the argument that raises in passive must have undergone movement within the *v*P — creating the Lethal Ambiguity that blocks attraction by the phase head (as discussed in section 3.1). I will conjecture therefore that in a *v*P with an external argument there is a projection between *v* and VP whose head bears a φ-probe with an EPP property. When *v*P undergoes Exfoliation, it is EnP that replaces it. Let us conjecture that this head, which I will call En, is responsible for what we call passive morphology when exposed — which occurs only when *v*P undergoes Exfoliation (which only happens when the oblique option is chosen for the external argument).

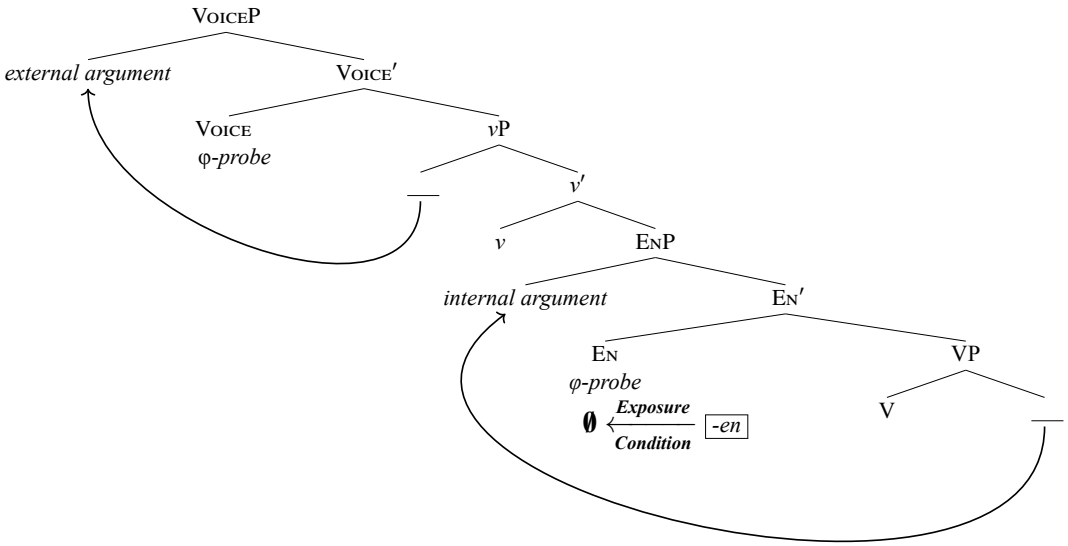
We now have in hand the pieces that permit an adaptation into the framework of this work of Müller's analysis of passive. The key new proposals are an attracting head (Voice) immediately external to *v*P and another such head (En) external to VP. Neither head is specific to passive or comes in distinct active and passive flavors — though En is present only as the complement to a *v* that introduces an external argument, and absent otherwise. The distinction between active and passive voice arises from the choice of a non-oblique (normal DP) or oblique (*by*-phrase) external argument.

94. In the English passive, the *by*-phrase appears postverbally, rather than to the left of V, as would be predicted if it linearized as a specifier of VP. I have no account of this fact (one respect in which the theory sketched here is inferior to the "smuggling" alternative proposed by Collins (2005), except to speculate that the righthand position of the *by*-phrase might somehow be a by-product of the fact that it is a late-attached specifier of VP.

(247) **Passive voice**



(248) **Active voice**



Many questions arise which I will not explore or answer here. Since our adaptation of Müller's proposal relies on movement triggered by a higher head, one question concerns instances of passive that do not involve overt or obvious movement of any element from inside VP. Two cases are impersonal passives of the sort permitted by German and passive in languages like Italian or Spanish, where the argument that moves in English may remain VP-internal. For impersonal passives, we might borrow from work in Relational Grammar an analysis of this construction according to which impersonal passives involve a pleonastic object (null in German, when not occupying the specifier of CP) introduced within the VP — an "initial 2" in Relational Grammar terms — that raises just like its non-pleonastic counterparts (Perlmutter and Postal 1984, 106 ff.). For passives in which the nominal that raises in English appears to remain in VP-internal position, several analyses, the relevant nominal might be taken to raise covertly at least as far as VoiceP, or else we might expand the structural description of Exfoliation to permit instances of pure Agree without movement to trigger the process — a potential friendly amendment that I will leave for future work.

Another question concerns the claim that the presence of En in passive but not active constructions is an effect of the Exposure condition, in view of the fact that En is affixal. In section 3.3.4, we tentatively

excluded the finite tense and agreement morphology controlled by T from the effects of the Exposure morphology by stipulating that a head that assigns morphology may do so even when not exposed. If the comings and goings of voice-dependent En morphology is attributed to the Exposure condition, some difference must be found between the two cases — which I also leave for future work.

The most salient questions perhaps concern the *raisons d'être* for the existence of Voice and En in the first place. Since En must be stipulated to be present only when selected by an instance of *v* that assigns an external argument, it is possible that its *raison d'être* might be sought in a semantic role mediating between the external argument introducer and the predicate that introduces the internal argument — perhaps connected with aspect in some fashion. Though ours is far from the only proposal to posit a Voice head, its reason for existence remains a mystery, in this context as well as others.

While our discussion of passive remains speculative, it is presented here as a possible instance of Exfoliation applying to domains other than CP, and also as a demonstration of the kinship and possibilities for cross-fertilization between the Exfoliation framework and Müller's work on structure removal.

In this brief chapter and its predecessor, I have attempted to show how the approach might deal with a variety of issues beyond R1, R2 and Ā-movement, which constituted the core of our discussion. In the next, final section of this work, I take up a central challenge to the Exfoliation approach to clause size — avoided so far: the peculiarly restricted semantics available to nonfinite clauses (at least in languages like English), compared to their finite counterparts.

Chapter 7

Reverse engineering silence: the semantics of infinitives

Finite clauses are free to pick and choose among the full range of tenses, aspects, and moods made possible by the lexical resources of the language. A finite clause in English may involve present or past tense morphology and a range of modals. A nonfinite clause, however, is not only restricted in its ability to include such elements, but is limited in its ability to express the very meanings that these elements convey. *Mary believes Sue to own a car,* for example, can only describe a situation in which the time at which Sue owns a car overlaps the time of Mary's belief that she does, i.e. *Mary believes that Sue owns* [PRESENT] *a car*. It cannot describe a situation in which the time of Sue's car ownership precedes and fails to overlap with the time of Mary's belief, i.e. *Mary believes that Sue owned* [PAST] *a car*. On the other hand, *We decided to fly to Boston* does not describe a situation in which the flying time overlaps the decision time. Instead, the (planned) flying time must follow the decision time, cf, *We decided that we would fly to Boston*.

These restrictions are interesting and complex in their own right, but pose a particular challenge to any approach that posits a finite origin for nonfinite clauses, such as the Exfoliation proposal developed here. When Exfoliation produces a nonfinite clause by deleting the outer layers of a clause, the exponents of the heads deleted by that process are no longer pronounced. In section 2.6.2, Icelandic evidence was (cautiously) presented favoring a theory in which phonology is in fact assigned to such elements before Exfoliation takes place, and then revised as a consequence of Exfoliation. The possibility that certain gradient judgments might correlate with phonological properties of unpronounced material provided one of the more surprising *derivational opacity* arguments for the overall approach.

One might take a similar approach to the semantics of nonfinite clauses. We might imagine that while they are still finite, these clauses may contain any tense element and any modal that a normal finite clause can host, and that these elements undergo semantic interpretation when the clausal phase has been fully constructed. One might then propose that if Exfoliation later eliminates the clausal layers containing tense and modality, the semantic interpretation previously applied to that clause is revised, deleting those aspects of meaning whose carriers were the heads of those clausal layers. Such a proposal would lead us to expect that after Exfoliation, a nonfinite clause is literally tenseless. As it happens, independent of the Exfoliation proposal, Wurmbrand (2014) has argued for just such a characterization of English infinitival complements. Her paper explores almost the entire range of English non-finite complement clauses (omitting only bare infinitives without *to*), and makes a strong case that they actually are tenseless.

Wurmbrand argued for the tenselessness of English infinitival complements by showing that no matter what element one might propose as the finite counterpart of infinitival tense, the infinitival version differs in its behavior in multiple respects. Consequently, there is no unique tensed counterpart that one can posit as the "true nature" of any given infinitival complement. Crucial to the plausibility of her proposal, however, is the claim that the actual interpretation of any given comparable infinitive is compatible with total tenselessness. This conclusion is not completely obvious, however. Though the mapping between the semantic possibilities available to nonfinite and finite clauses is clearly complex in both directions,

the temporal and modal interpretations available to nonfinite clauses as a group do appear to be a proper subset of the interpretations available to finite clauses as a group. I am not aware of any "exotic" temporal or modal possibilities that one might view as exclusive to tenseless clauses.

In this chapter, I will build on Wurmbrand's work to suggest that the exact opposite conclusion from hers is at least equally plausible: that the semantics of tense in the English infinitives studied by Wurmbrand fails to correspond to any single finite counterpart because it actually ranges in principle across the full gamut of possible finite counterparts (as expected if infinitives are derived from finite clauses) — behaving in some cases like a present or past modal, in other cases like non-modal present or past tense, and in still other cases (closely following Wurmbrand's discussion) copying its tense value from the embedding verb.

Of course, while it might be the case that the semantics of infinitival tense does range *in principle* across the full gamut of finite possibilities, in reality, the actual possibilities are tightly constrained. That is the core of the puzzle motivating both Wurmbrand (2014) and the present discussion. While Wurmbrand argues that these constraints reflect deep tenselessness, I will argue that they are actually extra-grammatical, reflecting strong limitations on the ability of a hearer to "reverse engineer" the derivation behind a speaker's utterance, precisely when obligatory elements such as tense have been generated but not phonologically interpreted. This explanation for the limitations on the interpretation of infinitival complements, I will suggest, dovetails with an explanation for the properties of a seemingly different puzzle studied by Fitzpatrick (2006), for which he proposed an ingenious but ultimately self-contradictory solution that the approach suggested here resolves. I will also briefly suggest that this "reverse engineering" mode of explanation for the phenomena charted by Wurmbrand suggests new approaches to other phenomena as well.

If this proposal is correct, we actually have a kind of *semantic derivational opacity* argument for the Exfoliation approach — insofar as the interpretations that a hearer is capable of assigning to an infinitival clause include the meanings of tense-bearing heads and modals that are not present on the post-Exfoliation surface. The fact that these interpretations are a proper subset of those available to finite clauses is what the reverse engineering theory seeks to explain, but the fact that these interpretations are any kind of subset (and do involve actual tense and actual modality) provides the derivational opacity argument that supports the Exfoliation approach.

The data discussed in this chapter are almost entirely drawn from Fitzpatrick (2006) and Wurmbrand (2014). This is thus a "new perspectives" chapter, and not a "new empirical discoveries" chapter. It is the dovetailing with Fitzpatrick's puzzles and the proposals that I argued for in previous chapters that may argue for my perspective over Wurmbrand's — not (at least for now) new empirical predictions of the new approach. Despite reaching conclusions opposite to hers, I want to call attention to how closely my discussion will follow Wurmbrand (2014) and how much it owes to her important discoveries.

7.1 The factative effect in English AUX-drop

7.1.1 *Fitzpatrick's discoveries*

Fitzpatrick (2006) studied a type of yes/no question, common in spoken Standard English, in which the auxiliary verb that is moved to C is omitted. He called this the AUX-*drop construction*:

(249) **English AUX-drop**

a. Anybody want a hot dog? (= *Does anybody want a hot dog?*)

b. Anyone seen John today? (= *Has anyone seen John today?*)

c. Anybody going to the game? (= *Is anybody going to the game?*)

(Fitzpatrick 2006, 400, ex.(1))

d. Anybody accused of a crime today? (= *Was anybody accused of a crime today?*

Fitzpatrick provides several arguments that an AUX-drop clause is generated as a full interrogative CP in which an auxiliary verb moves from T to C, just as it does in the more formal non-AUX-drop counterparts given in parentheses above. Fitzpatrick shows first that AUX-drop questions are at least as large as TP, by noting that they may contain negation (*Anybody not like John?*) and higher adverbs (*Everyone probably coming tomorrow?*). A subject pronoun in an AUX-drop question must be nominative (*He here yet?/*Him here yet*), as expected if the pronoun is a normal subject in a finite T (despite the absence of any overt finite auxiliary verb or exponent of T).

Fitzpatrick then proceeds to show that an AUX-drop question is even larger than TP — and in particular, that it is generated as a full CP, in which an auxiliary verb in T has moved to C. As he notes first, if the interpretation of examples like (249a-d) as yes/no questions relies on semantics crucially provided by an interrogative C (as in most accounts of such questions), an AUX-drop clause must have been generated as a CP. An additional argument rests on the observation that licensing a negative polarity item like *anyone* and *anybody* in examples (249a-d) correlates with movement of AUX to C in less controversial matrix yes/no questions. For example, *how come* differs from its near-synonym *why* in not triggering AUX-to-C movement, and also differs in not licensing NPIs:

(250) ***Why* vs. *How come* as NPI licenser**

a. Why did you ever give anyone that?

b. *How come you ever gave anyone that? (Fitzpatrick 2006, 409, adapted from ex.(21))

Likewise, though *You gave him that?* with a rising intonation but no movement of AUX to C may be understood as a question requiring a *yes* or *no* answer (perhaps reflecting a variety of interrogative C that fails to trigger AUX-to-C movement), here too an NPI is not licensed:

(251) **AUX-to-C vs. its absence correlates with NPI licensing**

a. Did you ever give anyone that?

b. *You ever gave anyone that? (Fitzpatrick 2006, 409, adapted from ex.(20d-e))

In addition, both AUX-drop and non-AUX-drop yes/no questions show the effects of what is arguably an adjacency requirement preventing an adverb from intervening between the subject and the auxiliary verb that has moved to C, as (252a-b) show. This requirement (perhaps a Case Filter effect) is not found when AUX-to-C movement has not taken place, as the embedded question in (252c) shows:[95]

95. Fitzpatrick does not ground either the correlation between NPI licensing and AUX-to-C movement or the AUX-subject adjacency condition in deeper principles, with the result that these arguments might weaken as we learn more about these effects.

(252) **AUX-subject adjacency condition with and without AUX-drop**

a. *Is now everyone aware of the problem?

b. *Now everyone aware of the problem?

c. I wonder whether (now) everyone (now) is aware of the problem.

(Fitzpatrick 2006, 408, adapted from ex.(18)-(19))

Constructions that arguably require semantic parallelism with a full CP provide additional arguments (not from Fitzpatrick). For example, an AUX-drop question may be disjoined with a negative alternative in which AUX has moved to C, as (253) shows, and may provide an antecedent for Null Complement Anaphora where the non-null version would be a full-CP *whether* question:

(253) **Disjunction with full CP alternative**

You give your talk or didn't you?

(254) **Antecedent for Null Complement Anaphora of a *whether* question**

a. You giving your talk tomorrow, or don't you know yetΔ?

b. A: Anyone want coffee? B: I'll find out Δ.

If these arguments are correct, AUX-drop questions are generated as normal interrogative CPs in which the auxiliary verb moves to C — but some property of the grammar permits the auxiliary verb in C to remain unpronounced.

Fitzpatrick makes several further crucial observations. First, he observes that an auxiliary may be silenced by AUX-drop only if it has raised to C. A declarative clause like *It has given me a headache*, for example, cannot lose its auxiliary*: *It given me a headache*. The same is true of an embedded yes/no question in which the auxiliary remains in situ: ***I wonder whether Mary written a letter***. Furthermore, AUX-drop is limited to root clauses. The examples in (255) below also show that movement of AUX to C in the antecedent of a counterfactual conditional, an embedded environment, does not have a variant with AUX-drop. The additional examples in (256) show that when AUX moves to C in an embedded yes/no question, possible in informal spoken English (McCloskey 2006), AUX-drop is also impossible.[96]

(255) **AUX-drop only at the root: counterfactual inversion**

a. Had you written a better speech, Sue would probably have won the election.

b. *You written a better speech, Sue would probably have won the election.

(Fitzpatrick 2006, 409, adapted from ex.(20d-e))

(256) **AUX-drop only at the root: T-to-C in embedded questions**

a. Each actress wanted to know had she been chosen for the part or not.

b. *Each actress wanted to know she been chosen for the part or not.

For example, in view of our earlier discussion of apparent DP adjacency requirements as results of obligatory raising of the DP (e.g. our the obligatory adjacency between *for* and subject in (191), it is tempting to wonder whether AUX might not actually raise into a WP superstructure rather than just raising to C — in which case it could turn out that the subject must also raise into that domain. I will leave this possibility for future investigation.

Note that an embedded yes/no question introduced by *whether* or *if* does license a subject NPI, despite the absence of AUX-to-C, but at the same time permits an adverb to intervene between C and the subject (*I wonder whether/if now everyone is aware of the problem*), a difference between the two diagnostics that will also need an explanation.

96. The binding of *she* by *each actress* in this pair helps ensure that the yes/no question is normally embedded, and is not a quotation (cf. Fitzpatrick 2006 p. 420 fn. 24).

Fitzpatrick concludes that what yields the AUX-drop construction is the **optional non-interpretation by the phonology of the top layer of a fully built syntactic structure**. Though information about the entire structure dominated by the highest TP gets sent to the phonology during the course of the derivation, the contents of the root CP are not. This option makes sense, as Fitzpatrick notes, in the model of phase-by-phase interpretation proposed by Chomsky (2001), according to which the merging of each phrase head triggers phonological interpretation of the phase head's *complement* — as well as semantic interpretation of the complement, to which I return below.

The crucial case for the AUX-drop construction concerns the merger of C, which triggers interpretation of its complement TP. Chomsky's (2001) regime for phase-by-phase interpretation of syntactic structure works hand in hand with the additional hypothesis that constituents interpreted by this process are impenetrable for the remainder of the syntactic derivation. This impenetrability hypothesis both permits and requires apparent instances of extraction from phasal constituents to proceed through the phase edge, merging as a specifier of each phasal head on the path to its final destination.

As Fitzpatrick notes, however, this proposal comes at a cost: the theory must posit a special clean-up rule to interpret the final CP layer at the root. This fact lies at the heart of Fitzpatrick's account of AUX-drop: namely, "that this extra operation need not apply in all cases, and that AUX-drop is one case where it fails to apply." This proposal, however, raises serious questions concerning semantic interpretation. These questions embroil Fitzpatrick's account in a contradiction for which this chapter suggests a new resolution. It is this resolution, in turn, that will serve as a model for a reinterpretation of Wurmbrand's (2014) findings concerning the tense properties of English infinitives.

Fitzpatrick discovered a remarkable semantic property of AUX-drop that makes immediate sense if phonological and semantic interpretation apply together as a unit (Chomsky's 2004 rule of TRANSFER). In particular, AUX-drop sentences show a phenomenon made famous by Déchaine (1991), which she called the *factative effect* (adapting terminology from Africanist linguistics credited to Welmers 1973, 346). In some languages, a clause may lack overt tense marking but nonetheless be interpreted as tensed. Crucially, how tense is understood in such clauses depends on whether its main predicate is eventive (episodic) or non-eventive (e.g. stative). If the predicate is non-eventive, the tense is understood as PRESENT, but if it is eventive, the tense may or must be understood as PAST. The contrast in (257) demonstrates the factative effect in Haitian declarative clauses. Fitzpatrick cites additional examples from Fɔ̀ngbè, Yoruba, and Igbo. Example (258) illustrates Fitzpatrick's key discovery: a similar effect at work in the English AUX-drop construction:

(257) **Factative effect: Haitian Kreyòl**

a. *eventive→past*
   Pyè vann bèf yo.
   Pyè sell cattle DET
   'Pyè sold the cattle.'

b. *non-eventive→present*
   Sisi renmen chat mwen.
   Sisi like cat my
   'Sisi likes my cat.'

(258) **Factative effect: English AUX-drop**

a. *eventive→past*
You sell that cattle?
'Did you sell that cattle?'

b. *non-eventive→present*
You like my cat?
'Do you like my cat?' (Fitzpatrick 2006, 414, ex.(27a-d))

Following Déchaine (1991), Fitzpatrick suggested that the factative effect arises when no tense features are available to semantic interpretation. For languages like Haitian that show the factative effect in simple declarative clauses, Fitzpatrick posited a semantically underspecified but syntactically present T in sentences like (257a-b) . By contrast, the English AUX-drop construction involves a fully-specified T that moves to C as part of the auxiliary verb, by the normal process that builds matrix non-AUX-drop questions. Fitzpatrick also proposed the following: just as the phonological properties of the tensed auxiliary in C are not submitted to phonological interpretation in the AUX-drop constructions, its semantic properties are also not submitted to semantic interpretation. As far the semantics is concerned, therefore, the tense specification of T might as well never have been generated in the first place (even though it was). Because the contents of C are not interpreted, an AUX-drop sentence is understood as if it entirely lacked tense, yielding the same factative effect found in Haitian when T actually does entirely lack a tense specification.

7.1.2 *Reverse-engineering an AUX-drop derivation*

As mentioned above, Fitzpatrick's proposal ends up enmeshed in an apparent contradiction concerning the semantic interpretation of the silent material in the AUX-drop construction. The remarkable cross-linguistic correlation highlighted by Fitzpatrick between the factative effect and the absence of overt tense does indeed suggest that the phonological suppression of a tensed auxiliary has semantic repercussions. For English AUX-drop, however, the claim that these repercussions arise from total non-interpretation of the root CP contradicts some of the very evidence that argued that an entire CP had been built in the first place. That evidence had a crucial semantic component: normal yes/no question semantics correlating with T-to-C movement, correlating in turn with NPI licensing. Fitzpatrick noted this problem (p.422), but left it unresolved. He also noted an additional related puzzle (p.419): though the failure to submit the root CP layer to semantic interpretation might entail the lack of access to tense information that had been lodged in C thanks to T-to-C movement —given the copy theory of movement, that information should still be present on T in its original position (rendering the factative effect especially mysterious, as Carlo Geraci, personal communication, notes). Since reconstruction phenomena in other domains teach us that unpronounced earlier positions of moved elements may be semantically interpreted, it is puzzling that T-to-C movement followed by AUX-drop should be an exception.[97]

I believe that a different approach to Fitzpatrick's discovery can resolve these issues in a new way. This approach will turn out to have implications for the proper treatment of other clauses with "missing" content, such as nonfinite clauses.

Let us accept as convincing the data (mostly) from Fitzpatrick with which we began this section, which seem to show that though the contents of the CP layer in the AUX-drop construction are not subject to phonological interpretation, they *are* submitted to semantic interpretation. The interpretation of AUX-drop clauses as yes/no questions may thus rely on the semantic properties of interrogative C, and the availability

97. Fitzpatrick (2006) offered a tentative conjecture that the components of meaning relevant to question interpretation and NPI licensing might actually be contributed by a phasal head lower than C but higher than T — a head that is submitted to semantic interpretation as the (actual) complement to C. No additional evidence was offered for the existence of such a head with the properties attribute to it, and various problems are raised by this conjecture, briefly discussed in a footnote (p. 422, fn. 26).

of NPI licensing in such clauses will follow from whatever factors turn out to be relevant in non-AUX-drop yes/no questions.

What should we then make of the correlation between the phonological absence of the tensed auxiliary verb and the factative effect, which limits tense interpretation to PRESENT with non-eventive predicates, and PAST with eventive predicates? I propose that this correlation does not reflect the *grammar* of non-pronunciation and semantic interpretation at all, but reflects an entirely different consequence of non-pronunciation. When a speaker produces an utterance based on a derivation in which elements that normally receive a phonological interpretation are unpronounced, the language system of the hearer must *reverse-engineer* the speaker's derivation, supplying its own guesses concerning the identity of the unpronounced elements. If the speaker produces an AUX-drop question, for example, missing its tensed auxiliary verb, the language system of the hearer must rely on its own resources to supply the missing auxiliary verb and tense.

But what are those resources? I propose that they are limited, as a property of the human language faculty — and that it is the tightly limited capacity of a hearer for reverse-engineering the speaker's syntactic derivation, not the architecture of that derivation itself, that lies behind the factative effect in the English AUX-drop construction.

Let us begin by noting, with Fitzpatrick himself (p.14), that AUX-drop is impossible when the auxiliary is "semantically contentful". The auxiliary verbs whose pronunciation can be suppressed (supportive *do,* perfect *have*, progressive and passive *be*) are those that arguably lack semantics of their own, and are inserted to satisfy independent requirements of their morphosyntactic environment (cf. Grønn and von Stechow 2021, section 3 on perfect *have*). By contrast, as Fitzpatrick points out, modals that do have semantics of their own cannot be omitted as part of the AUX-drop construction:

(259) **No modal AUX-drop**

a. Anyone pick up John at the airport?
impossible with the meaning 'Can anyone pick up John at the airport?'

b. Anyone play the piano at the party tomorrow?
impossible with the meaning 'Will anyone play the piano at the party tomorrow?'

(Fitzpatrick 2006, 412, ex.(25a-b))

I propose that this fact itself should be understood as a consequence of a general limitation on the reverse-engineering of phonologically suppressed material. This limitation dictates that the reverse-engineering process must be semantically *unambitious*, positing as little semantics as possible that is not unambiguously reconstructable from the input provided by the speaker. I will call this limitation the *Principle of Unambitious Reverse Engineering* (PURE). In essence, PURE is a version of the much-debated principle of "Recoverability of Deletion" (Chomsky 1964, 41 and Katz and Postal 1964, 79ff), now viewed as an extra-grammatical property of the hearer's language system attempting to parse input from a speaker.

(260) **Principle of Unambitious Reverse Engineering (PURE)**
When determining the identity of unpronounced material in the course of reverse-engineering a speaker's syntactic derivation, the language system of the hearer considers only the *minimally semantically contentful possibilities* compatible with the morphosyntactic environment.

I use the phrase "language system of the hearer" to emphasize that the discussion does not concern conscious decisions of the hearer, but rather the automatic behavior of the cognitive systems that parse linguistic input, determine its meaning, and communicate this information to other cognitive systems. In what follows, I will sometimes refer directly to the hearer's language system with the word "hearer" to

keep the prose simple — but it is the hearer's language system that I intend throughout. I also assume that a speaker's language system self-monitors in the process of speech production, functioning as hearer as well as speaker, so that the planning of an utterance takes into account the restricted range of interpretations a hearer is permitted to entertain by the principle proposed below. So the term *hearer* in this chapter stands for an emphatically abstract concept.

Our intuitions that certain derivations do not permit AUX-drop, on this view, are hearer-side intuitions concerning what derivations can and cannot be reverse-engineered (in response to a signal in which the root CP is unpronounced) — not limitations on what the grammar can generate in the first place. The speaker's grammar thus overgenerates, and the effects of PURE have the logical status of a filter. [98]

Let us consider how PURE interacts with examples like (259a-b), where the hearer must posit an auxiliary verb in C. Here a semantically contentless supportive *do* is minimally semantically contentful and compatible with the morphosyntactic environment (since the highest audible verb is in the morphological bare form that cooccurs with auxiliary *do*). As a consequence, PURE guides the hearer of an utterance like (259a) or (259b) to posit a suppressed form of *do* and prevents the positing of a suppressed modal such as *can* or *will*. Likewise, because the morphosyntactic environment of an AUX-drop shows T movement to C, the least semantically contentful possibility for reverse-engineering the contents of C features an interrogative complementizer. We might also attribute to PURE the fact that the hearer is not free to assume that the CP of an AUX-drop construction contains any contentful *wh*-phrase other than the yes/no operator, conceivably the least contentful *wh*-form (as it is invokes two fixed focus alternatives and is phonologically null in main clauses independent of AUX-drop) — but I will leave the details of this aspect of the puzzle for later work.[99]

We return now to the factative effect in AUX-drop, which I suggest is just another consequence of PURE. When it is necessary to reverse-engineer a derivation in which a tensed but unpronounced auxiliary verb has raised to C, PURE requires the hearer to posit a semantically minimal specification for the unpronounced T.

But why should PAST qualify as a minimally contentful tense for an eventive predicate, while only PRESENT counts as minimally contentful for a non-eventive predicate? If PRESENT is a tense bound to the utterance time, then this relation may count as ubiquitous component of the "morphosyntactic environment" of any utterance, licensing the hearer to posit PRESENT as the tense specification of a silenced T, in keeping with PURE. A PAST specification for T, however, would add *anteriority* to the meaning of PRESENT, and thus qualify as less minimally semantically contentful. PURE might therefore prevent the hearer's parser from positing PAST with a non-eventive predicate, all things being equal. This derives the obligatorily PRESENT interpretation of an AUX-drop clause with a non-eventive predicate.

Why then should an eventive predicate license the positing of PAST by the hearer as the tense of the speaker's derivation that is being reverse-engineered? Note that eventive predicates are incompatible with

98. Carlo Geraci (personal communication) notes a similarity between these considerations and aspects of the "perceptual loop" theory of self-monitoring advanced by Levelt (1983, 96; 1989, chapter 12), as developed and debated in subsequent work. Levelt proposes a monitoring process that is "normally. opaque to the speaker, [which] should, rather, be regarded as based on the parsing of inner or overt speech". "The great advantage of [such] a perceptual theory," he continues, "is that controlling one's own speech is like attending to somebody else's talk. This makes it natural for the speaker to apply the same parsing procedures and sources of knowledge to his own speech as to other people's speech" (Levelt 1983, 96-97). PURE and its consequences as discussed in this chapter thus have obvious psycholinguistic implications, which I will not explore here, for lack of expertise — but hope may be clarified in future work.

99. Carlo Geraci (personal communication) notes an unsolved problem for this approach: the fact that silencing of a *wh*-phrase other than *whether* is blocked even when the selectional properties of an obligatorily transitive verb might render this compatible with PURE. Thus **You wear?* is not acceptable, for example with the reading *What did you wear?,* despite the transitivity of *wear.* I leave this issue open.

the simple PRESENT, unless coerced into a habitual or generic use (a fact that will be important in our discussion of infinitival clauses below):

(261) **Present tense incompatible with eventive predicates (unless coerced)**
  a. *Mary sings in the shower now. / *Alice reads a book now. / *Bob sells that car now. [unless habitual]
  b. Sue owns a car now. / John like my cat now. / Bill knows German now. etc.

I propose that it is precisely because of the incompatibility of the English PRESENT with an eventive predicate that PURE permits the hearer to posit an underlying PAST in an AUX-drop construction where the unpronounced auxiliary in C is *do* and the main predicate is eventive. PAST is the least semantically contentful option compatible with the morphosyntactic environment. I will leave it as an open question whether this suggestion for English AUX-drop illuminates the roots of the factative effect in other languages such as Haitian Kreyòl.[100]

We may now adopt Fitzpatrick's proposal that AUX-drop arises from the more general possibility of leaving the highest layer of the root clause phonologically uninterpreted, without the contradictions that arose from extending this possibility to semantic interpretation as well. If the proposal advanced here is correct, there is no comparable optionality for semantic interpretation. The syntactic derivation is subject to semantic interpretation up to the root. The factative effect is a by-product of failing to phonologically interpret the CP layer of the main clause, just as Fitzpatrick proposed. But it is not a direct result of the grammatical derivation per se, but instead reflects the strictures imposed by PURE on the hearer forced to reverse-engineer the speaker's derivation. In in the absence of evidence concerning the value of T that was included in the speaker's syntactic derivation, the hearer must assume a maximally unmarked value compatible with the morphosyntactic environment.[101]

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100. Déchaine (1995) offers a more detailed proposal concerning the tense interpretation of eventive predicates in these constructions, which I believe could be incorporated into the present discussion. Her account also correctly predicts the fact that Haitian Kreyòl favors a non-past generic interpretation for eventive predicates with a bare indefinite direct object, a fact also found in the AUX-drop construction when the direct object is a mass singular or bare plural:

eventive/indefinite object →present

a. Pyè vann bèf.
   Pyè sell cattle
   'Pyè sells cattle.' Déchaine (1995, 74, ex. (37a))

b. You sell cattle/cars?
   'Do you sell cattle/cars?'

I am grateful to Athulya Aravind (personal communication) for bringing Déchaine (1995) to my attention.

101. Our discussion leaves several important unresolved questions unanswered. We must ensure, for example, that a hearer's disambiguation of a syncretic form ambiguous between PAST and PRESENT such as *put* or *hit* is not subject to PURE. Ignorance concerning the precise identity of an item that has been phonologically interpreted (albeit confusingly) is evidently not the same problem for the hearer as determining the identity of an item that has avoided phonological expression entirely. Ellipsis is another, much larger elephant in the room of this analysis. There it is tempting to view the "surface anaphora" property of ellipsis (the need for a linguistic antecedent) as a sign of the strictures of PURE at work, but I leave the possible development of this idea for future work as well.

7.2 Exfoliation and the tense interpretation of infinitives

7.2.1 *The derivational theory of infinitivization*

We are now in a position to return to the main topic of this chapter: the semantic restrictions characteristic of infinitives, and how these might be explained if nonfinite clauses are generated as full and finite clauses whose outer layers are eliminated by Exfoliation.

In earlier chapters, we saw several *derivational opacity* arguments for the proposal that infinitival clauses are born full and finite, and become infinitives during the course of the syntactic derivation: infinitival clauses in English, Icelandic, and other languages in which nominals are licensed, bear NOM case, and exhibit an Anaphor Agreement Effect (as well as configurations in which the verb showed agreement-based restrictions) — despite the absence of visible agreement morphology. These findings supported a crucially derivational analysis according to which nominal licensing, the assignment of NOM case, and agreement-sensitive bans on certain forms take place when agreement is present in the structure, with consequences that remain even after the structures supporting agreement are eliminated by Exfoliation.

This derivational approach to nonfinite clauses faces an important problem, however, concerning semantic interpretation. All things being equal, we might expect to find straightforward derivational opacity arguments in this domain as well. Just as NOM morphology is preserved on the postverbal subject in (59) even after the T with which it agreed and from which it (arguably) received NOM has been eliminated, so we might expect the various tenses and modals available to finite clauses to continue to show semantic signs of their former presence. In fact, however, tense interpretation in infinitival clauses is severely restricted, in ways we will discuss in this section, building on Wurmbrand (2014). Why do infinitival clauses not show the full range of semantic possibilities available to finite clauses? If they did, it would furnish a semantic derivational opacity argument analogous to the morphosyntactic arguments that support the Exfoliation theory of infinitivization.

One response might be to reject the derivational view of infinitivization (in favor of a more standard approach according to which nonfinite clauses are generated as such, and problems like those raised above are solved in some other way). Another response might propose that some aspects of semantic interpretation apply late in the derivation, after Exfoliation has taken place. This is a logical possibility mentioned in Pesetsky 2019, but entails that semantic interpretation does not apply entirely cyclically during the course of the syntactic derivation — contradicting results such as those reported by Fox (1999; 66-73) and others that argue that semantic interpretation is strongly cyclic, fully interspersed with the syntactic derivation.

A variant of this second response might acknowledge that semantic interpretation is interspersed with the syntactic derivation, but permit the semantics of a constituent targeted by Exfoliation to be *revised*, deleting or altering those components of meaning that owed their existence to material deleted by the Exfoliation operation.[102] Phonological interpretation might work this way as well, if it too is fully interspersed with the syntactic derivation. If, for example, a fully built CP undergoes phonological interpretation, only to lose its outer layers to Exfoliation later in the derivation, we must entertain a theory according to which cyclic phonological interpretation is subject to later revision — and it would not be surprising to learn that semantic interpretation follows a similar pattern. As I noted in the introduction to this chapter, Wurmbrand (2014) argues that English nonfinite clauses are deeply *tenseless* — a proposal

102. I am grateful to Carlo Geraci and a reviewer of an earlier presentation of this material for helping me to clarify the reasoning in this paragraph.

that might seem to fit this variant response quite neatly. Semantic tenselessness is a natural outcome if the elimination of TP by Exfoliation triggers elimination of the semantics that TP introduced.[103]

Nonetheless, I will argue for an entirely different solution to this puzzle here. I will suggest that semantic interpretation is *not* revised in the wake of Exfoliation, and thus that the interpretation of nonfinite clauses is always an interpretation inherited from derivational period when it was full and finite. On this view, the semantic effects charted by Wurmbrand are not indications of tenselessness — and in fact, are not restrictions on the semantics of infinitival complements at all. They are actually PURE effects: limitations on a hearer's ability to ascribe semantic properties to phonologically suppressed material, when reverse-engineering the derivation behind a speaker's utterance. I believe this alternative is more attractive because the semantics of nonfinite clauses (in English at least) do not actually point in the direction of tenselessness. The mapping among the semantic possibilities available to nonfinite and finite clauses is indeed complex (as we shall see). Nonetheless, the set of temporal and modal interpretations available to nonfinite clauses appears to be a *proper subset* of the set of interpretations available to tensed finite clauses, its tense (and modal) semantics always corresponding to that of some type of tensed clause, with no *sui generis* possibilities that might indicate total tenselessness. I take this to be an important observation that may favor the approach developed below over the approach developed by Wurmbrand (2014).

On the speaker's side of the story, I therefore suggest that in principle, any tense or modal in T may be eliminated by Exfoliation in the process of generating an infinitival clause. Crucially, the semantics provided by this tense or modal remains intact and unrevised through the end of the derivation. It is the *hearer*'s side of the story that imposes the restrictions documented by Wurmbrand and discussed below. Though in theory any tense or modal can be exfoliated away in the course of the speaker's derivation, in practice a hearer can posit only those tenses and modals to the embedded clause that are semantically *minimal* and compatible with their environment — in the cases at hand, compatible with the selectional properties of the higher predicate and the ubiquitous availability of the utterance time as an anchor for tense. This is the source of our sense that infinitival clauses are inherently restricted in the tense and modal specifications that they can express. Not every meaning producible by a speaker's derivation can be reverse-engineered and attributed to it by the hearer.

Though the proposal advocated here is essentially the opposite of Wurmbrand's (interpretation as tensed vs. deep tenselessness), my presentation will be entirely derivative of the findings reported in Wurmbrand (2014), including her classification of the phenomena she discovered. Following Wurmbrand, we first consider future infinitives (complements to verbs like *want* and *decide*) and then propositional infinitives (complements to verbs like *claim* and believe), followed by a brief discussion of infinitival clauses understood as simultaneous in tense with the clause in which they are embedded (complements to verbs like *manage* and *seem*). We are able to reach such different conclusions from the same set of findings because we pursue different strategies of argumentation concerning these findings. These can be summarized as follows:

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103. A reviewer makes the interesting observation that under Chomsky's (2001, 13, ex. (9)) proposal concerning the timing of phonological and semantic interpretation, one might be able to adopt this variant without any notion of revision. According to this proposal, a phase is spelled out (its contents transferred to PF and to LF) and rendered impermeable to processes such as movement only when the *next* phase head is merged. On this view, a clausal complement to V will not be subject to spell out and rendered impermeable until the higher *v*P has been completed. By this time, Exfoliation of that clausal complement will already have taken place, since the relevant triggers are all contained in that *v*P phase. The entire *raison d'être* of Exfoliation
as developed in Pesetsky (2019), however, rests on the impermeability of non edge positions within the embedded clause to movement across the clause boundary. Exfoliation takes place precisely so as to leave the goal for the *v*P internal probe at the edge of what remains of the embedded clause, rendering it accessible for movement triggered by that probe. Though one can imagine reformulations that might render versions of the two proposals compatible, they are clearly at odds with respect to the status of the pre Exfoliation embedded clause.

(262) **Strategies of argumentation**

a. **Wurmbrand (2014)**: The behavior of future, propositional, and simultaneous infinitives cannot be exclusively identified with any single value that tense may bear in a corresponding finite clause. These complements do display behavior consistent with tenselesness. Therefore they are deeply tenseless.

b. **This chapter**: The behavior of future, propositional, and simultaneous infinitives may be identified with the *union of behaviors* expected from all the semantically minimal values for tense that a hearer can posit when unambitiously reverse-engineering the pre-Exfoliation portion of the speaker's derivation (as required by PURE). Therefore they are not deeply tenseless.

Crucially, if the alternative advocated in this chapter is correct, we do have a derivational opacity argument for tense semantics after all — since the tense interpretation of an infinitive does reflect the pre-Exfoliation tense properties of a T that is later deleted, a fact obscured by the severe restrictions imposed on the hearer by PURE. This will leave us with one apparent discrepancy between the outcome of PURE for AUX-drop and its outcome for infinitivization — but this discrepancy follows from the difference between (1) non-pronunciation of syntactically present structure (AUX-drop, following Fitzpatrick), and (2) actual deletion of syntactic structure by Exfoliation.

7.2.2 *PURE and future infinitives*

Following Wurmbrand, we consider first the class of infinitival complements with future (or irrealis) semantics, like the Raising (ECM) complement (263a) and the Control complement in (263b):

(263) **Future infinitives**

a. Yesterday, Mary wanted/needed John to leave tomorrow.

b. Yesterday, Mary decided/wanted/planned to leave tomorrow.

(Wurmbrand 2014, 408, adapted from ex.(6))

Future infinitives have often been described as "tensed" in the literature since Stowell (1981, 40ff.; 1982). Such theories entail that these infinitives contain in some fashion a silent variant of English *will* or *would*. Wurmbrand sought to dispel this idea, by demonstrating that the properties of future infinitives are not identical to those of either English *will* or *would* — which she analyzes as bimorphemic auxiliary verbs consisting of an abstract modal *woll* plus PRESENT tense (*will*) or PAST tense (*would*). She argues at length that the properties of future infinitives favor a theory according to which such infinitives are *deeply tenseless*. Specifically, they contain *woll* but no specification for PAST or PRESENT whatsoever. If her conclusions are correct, future infinitives present the exact opposite of a derivational opacity argument for the syntactic derivation of nonfinite clauses by Exfoliation. They present a derivational conundrum for an Exfoliation theory. If a future infinitive was indeed tensed in its derivational youth, as the Exfoliation proposal claims, the theory must somehow ensure that no residue of its tensed beginnings survives in the semantics of its final infinitival form. Below, I survey these arguments and suggest an alternative.

Wurmbrand first contrasts the behavior of future infinitives with the behavior of present-tense *will*. *Will* places a situation in the absolute future with respect to the utterance time, while a future infinitive may pick out a time that merely follows the time of the higher clause:

(264) **Future infinitive → relative future vs. *will* → absolute future**

a. Leo decided a week ago [that he will go to the party (*yesterday)]

b. Leo decided a week ago [to go to the party yesterday]. (Wurmbrand 2014, 414, ex. (22))

Sequence of tense (SOT) effects also reveal ways in which future infinitives do not behave as though they contain *will*. Following Ogihara (1996), Wurmbrand assumes that sequence of tense effects are the result of a rule that deletes a tense at LF, if it is in the immediate scope of another tense with the same value — and binds the situation time of the lower clause to that of the higher clause. For this reason, as she notes, the embedded clause in *We found out that Mary was happy* does not require the time of the embedded clause to precede the time of finding out, but permits the time of the embedded clause to overlap that time — as a consequence of the higher occurrence of PAST deleting the embedded occurrence.

As she also notes, citing Ogihara, the sequence of tense rule applies in the same way to PRESENT in a sentence like *John will see the unicorn that is walking,* yielding a possible interpretation under which the unicorn's walking takes place at the seeing time, not utterance time. Crucially, it is the PRESENT component of *will* that triggers the deletion at LF of embedded PRESENT (resulting of the binding of the lower situation time by the higher).

Wurmbrand now considers the three-clause structure in (265a) in which PAST in the highest clause is separated from PAST in the lowest clause by an intervening clause containing *will*, which as we have seen contains PRESENT. As predicted, PAST in the lowest clause cannot be deleted, since the intermediate clause contains PRESENT, and the closest higher instance of PAST is in the highest clause. Crucially, however, replacing *will* in the middle clause with a future infinitive in (265b) yields a different result — the possibility of an SOT interpretation of the embedded clause, which Wurmbrand interprets as directly triggered by PAST in the highest clause. PAST in the highest clause can trigger SOT deletion of PAST in the lowest clause, Wurmbrand suggests, because the intermediate clause is truly tenseless, and in particular does not contain a null counterpart to the PRESENT-tense *will* in (265a).

(265) ***Will* blocks SOT deletion of PAST, but future infinitive does not**

a. [$_{\text{PAST}}$ John promised me yesterday [$_{\textit{will}}$ that he will tell his mother tomorrow [$_{\text{PAST}}$ that they were having their last meal together]]].
**telling time = meal time*

b. [$_{\text{PAST}}$ John promised me yesterday [$_{\text{FUT INFIN}}$ to tell his mother tomorrow [$_{\text{PAST}}$ that they were having their last meal together]]].
✓telling time = meal time (Wurmbrand 2014, 415, ex.(24a),(25a))

Wurmbrand next contrasts the behavior of future infinitives with the behavior of past-tense *would*. As she notes, an idiosyncrasy of *would* is the fact that (except in the consequent of a conditional) it is permitted only in an SOT environment where its PAST feature can be deleted by PAST in the immediately containing clause. It is therefore blocked in a main clause (except as the consequent of a conditional missing its antecedent, e.g. **Yesterday, I would be kin*g) — and blocked in an embedded clause if the immediately containing clause is not PAST, as illustrated in (266a), where the higher clause contains PRESENT-tense *will.* Crucially, a future infinitive is possible in the same environment where *would* is blocked, as (266b) shows:

(266) ***Would* is excluded in non-PAST SOT environment, but future infinitive is not**

a. [$_{\textit{will}}$ *John will promise me tonight [$_{\textit{would}}$ that he would tell his mother tomorrow …]]

b. [$_{\textit{will}}$ John will promise me tonight [$_{\text{FUT INFIN}}$ to tell his mother tomorrow [$_{\text{PAST}}$ that they were having their last meal together.]]] (Wurmbrand 2014, 415, ex.(29a),(30a))

Furthermore, as Wurmbrand also notes, the most embedded clause in (266b) lacks any SOT reading that could permit the meal-eating time to be identical with the telling time, as we would expect if the future infinitive could be understood as a silent version of PAST-tense *would* (perhaps immune for some rea-

son to the restriction to PAST SOT environments). It is therefore clear that the future infinitive cannot be uniformly identified as a silent version of *would* any more than it can be uniformly identified as a silent version of *will*. Once again, Wurmbrand concludes that future infinitives are simply tenseless, containing an untensed *woll.*

In fact, however, another interpretation of these findings is possible — mentioned by Wurmbrand herself, who attributes the observation to "David Pesetsky and a reviewer" (p. 440).[104] Although the future infinitive does not behave *uniformly* like either *will* or like *would*, wherever it fails to behave like *will* it behaves like *would*, and wherever it fails to behave like *would*, it behaves like *will*.

Consider first the availability of SOT deletion of PAST in the lowest clauses of (265a-b) , impossible if the middle clause contains *will*, but possible if the middle clause contains a future infinitive. Wurmbrand took these data to show that the middle clause is untensed, but they could equally well show that the middle clause contains a silenced PAST-tense *would:*

(267) **Substituting *would* for *will* in (265a) permits the missing reading**
[$_{\text{PAST}}$ John promised me yesterday [$_{would}$ that he would tell his mother tomorrow [$_{\text{PAST}}$ that they were having their last meal together]]].
✓ *telling time = meal time*

On this view, it is PAST in the middle clause, not PAST in the highest cause, that deletes PAST in the lowest clause, yielding the SOT interpretation under which the telling time and the meal-eating time are identical. Note that the PAST feature of this silence *would* will itself be deleted under the influence of PAST in the highest clause — but that is exactly what overt *would* requires. Assuming that SOT applies cyclically, we have an instance of LF derivational opacity, since the tense responsible for deleting PAST in the lowest clause is not present in the final LF representation.

Now consider the availability of the future infinitive in (266b) in an environment where *would* is blocked. Once again, though this possibility is compatible with Wurmbrand's view that the middle clause is untensed, it could equally well show that here the future infinitive contains a silenced PRESENT-tense *will* — which is not blocked in this environment. And indeed, (266b) can be paraphrased with overt *will* in the middle clause:

(268) **Substituting *will* for *would* in (266a) eliminates the star**
[$_{will}$ John will promise me tonight [$_{will}$ that he will tell his mother tomorrow …]]

The view that a future infinitive may be understood as containing either a silenced *will* or a silenced *would* is exactly what we expect under the Exfoliation hypothesis for nonfinite clauses, according to which they are generated by Merge as full and finite CPs — with Exfoliation responsible for stripping them of their CP and TP layers in the course of the derivation. On this view, all things being equal, the source of a future infinitive must be a finite clause with future content, but that content may in principle be either *will* or *would*. From this vantage point, the discovery that both possibilities are in fact instantiated comes as no surprise. Example (265b) is acceptable on an SOT reading because there is a derivation in which its middle clause was generated with *would*, while (266b) is acceptable because there is a derivation in which its middle clause was generated with *will*.

Now note that because *would* (except as the consequent of a conditional) is idiosyncratically restricted to SOT environments, the two kinds of future modals that may be generated in a complement clause bear either PRESENT tense at LF (*will*) or no tense whatsoever at LF, due to the tense-deleting action of SOT

104. I have no memory of making this observation.

(*would*). If these modals disappear in the course of the derivation as a consequence of Exfoliation, yielding an infinitive, the hearer of such a clause faces a reverse engineering task not unlike that posed by an English AUX-drop clause. In particular, the hearer's parser must assign content to the finite T of the derivational ancestor of the infinitival clause. If PURE is correct as stated in (260), the hearer's options are tightly restricted, limited to "least semantically contentful possibilities compatible with the morphosyntactic environment".

Is the distribution and range of possible interpretations for a future infinitives compatible with PURE? If *semantic selection* and *binding* count as elements of the morphosyntactic environment relevant to PURE, the answer is yes. Assuming with Wurmbrand that *will* and *would* are the PRESENT and PAST tense forms, respectively, of an abstract morpheme *woll*, we need to ask (1) whether PURE permits the positing of *woll* in infinitival complement clauses where no form of the modal is visible, and (2) whether PURE permits positing both PRESENT and PAST in free alternation as the tense of this modal. I believe the answer is plausibly yes.

If selection is a component of the morphosyntactic environment relevant to PURE, then the positing of an "ancestral" *woll* in the complement to a verb like *promise* can be justified by the semantic selectional properties of *promise* and any other predicate that describes an attitude towards a future situation. *Woll* adds no semantics to what is required by the morphosyntactic environment, and therefore should count as "minimal" in the sense relevant to PURE.

What about PRESENT, the non-modal component of *will*? Building on the proposals advanced in section 7.1.2, if PRESENT is a tense bound to the utterance time, this relation alone should license positing PRESENT as the tense specification of T in a future infinitive, without violating PURE.

Finally, what about PAST, the non-modal component of *would*? Continuing to build on the proposals advanced in section 7.1.2, a PAST specification for T that survived until LF should count as non-minimal, since it adds *anteriority* to the meaning of PRESENT. PURE should therefore prevent the hearer from positing ancestral PAST as part of the derivation of a future infinitive, all things being equal — with one important qualification. If an instance of PAST makes no semantic contribution at all because it is deleted by the SOT rule, positing such an instance of PAST will be perfectly compatible with the strictures of PURE. As Wurmbrand noted and as discussed above, *would* is in fact restricted to SOT environments. It thus follows that the hearer's parser should be free to posit ancestral *would* as an auxiliary verb of a future infinitive, just as suggested above.

Summarizing the crucial properties of the speaker and the unambitious reverse-engineering hearer in this domain:

(269) **Speaker and hearer summary: future infinitives**
Speaker: free to posit any content whatsoever for T of the embedded clause

Hearer (restricted by PURE):

a. Hearer posits *woll* because it is selected by the higher verb. No other modal is possible.
b. Hearer may posit PRESENT as the pre-Exfoliation tense of the future modal because it is semantically minimal (as we saw in discussing AUX-drop), yielding *will*.
c. Hearer may posit PAST as the pre-Exfoliation tense of the future modal so long as it is semantically inert due to SOT (as is always the case with *would*).

7.2.3 *PURE and propositional infinitives*

We turn now to non-future infinitival clauses with propositional semantics, such Raising/ECM complements to verbs like *believe* (e.g. *She believes Mary to be the winner*) and control complements to verbs

like *claim* (*She claimed to be the winner*). As Wurmbrand notes (cf. Pesetsky 1991), these complements have aspectual properties strongly reminiscent of the English PRESENT, resisting eventive interpretation of simple VPs, as briefly discussed in section 7.1.2 above:[105]

(270) **Eventive interpretation: propositional infinitives that pattern with English PRESENT tense**

✓*non-eventive*

a. Bill knows German well.

b. They believe Bill to know German well.

c. They claim to know German well.

**eventive*

d. *Mary sings in the shower right now.

e. *They believe Mary to sing in the shower right now.

f. *They claim to sing in the shower right now.

(Wurmbrand 2014, 431, adapted from ex.(55)-(56))

The English PAST does license eventive interpretation, but infinitival complements to verbs like *believe* and *claim* cannot be understood as bearing PAST tense semantics (without the addition of *have* + *-en*, discussed below):

(271) **Propositional infinitives that may not be understood as PAST tense**

a. Mary sang in the shower yesterday at 8:00.

b. *They believe(d) Mary to sing in the shower yesterday at 8:00.

c. *They claim(ed) to sing in the shower yesterday at 8:00.

d. They knew German well when they were young.

e. *They believe(d) Bill to know German when they were young.

f. *They claim(ed) [to know German well when they were young].

Let us first consider these observations from an Exfoliation perspective. If infinitival clauses like those in (270b-c) are derived from full finite clauses, once again the hearer of such a complement must reverse-engineer the speaker's derivation, and posit a tense value for T in that clause. If PURE permits the hearer to posit ancestral PRESENT but not PAST, for the reasons just discussed, the contrasts in (270) and (271) are immediately predicted. If the hearer posits ancestral PRESENT, it is no surprise that eventive interpretation is restricted just as it is in PRESENT tense clauses that have not been reduced to infinitives by Exfoliation. Positing PAST is ruled out by PURE, since PAST is not semantically minimal as PRESENT is.

Wurmbrand, however, presents an SOT environment in which infinitival complements like these behave differently from PRESENT tense finite clauses. The argument once again involves SOT in a three-clause structure in which the infinitival clause is the middle clause:

(272) **Propositional infinitives that appear not to block SOT**

a. [$_{\text{PAST}}$ A year ago, they believed Mary [$_{\text{PROP INFIN}}$ to know [$_{\text{PAST}}$ that she was pregnant]]].

b. [$_{\text{PAST}}$ A year ago, Mary claimed [$_{\text{PROP INFIN}}$ to know [$_{\text{PAST}}$ that she was pregnant]]].

(Wurmbrand 2014, 433, ex.(59b),(59c))

As Wurmbrand points out, the pregnancy time in the examples of (272) may be understood as bound by the believing/claiming time, a clear sign that the SOT rule has deleted PAST in the embedded clause. This

105. Wurmbrand uses the term "episodic", where I use "eventive" for consistency with other discussion. If there are crucial differences between these notions that might compromise the overall argument, I leave that issue for future research.

is of course not possible if the infinitival middle clause is understood as containing PRESENT, since SOT deletes a lower tense under identity with the most immediately superordinate tense. Wurmbrand concludes that it is the PAST tense of the main clause that triggers deletion of the PAST tense of the most embedded clause, and therefore the infinitival middle clause must be viewed as tenseless.

Once again, however, the Exfoliation/reverse engineering approach suggests an alternative. The contrasts in (271) show that a hearer cannot posit ancestral PAST for the infinitival complement of a verb like *believe* or *claim* — where PAST should survive until LF and receive its normal interpretation. If a hearer were to posit ancestral PAST in the middle clause of (272), it could be deleted by the SOT rule (since the tense of the higher clause is also PAST). When this happens, PAST in the middle clause will make no contribution of its own to LF interpretation, and will consequently count as a PURE-compatible choice for the hearer reverse-engineering the derivation of the middle clause. On this view it is PAST in the *middle* clause that triggers SOT deletion of PAST in the lowest clause (before it itself is deleted), not PAST in the highest clause. The logic is essentially the same as the logic behind our proposal for (266b).[106]

Wurmbrand notes a related contrast between infinitival complements to verbs like *believe* and *claim* amenable to the same alternative view. In examples like (273a-b), PRESENT embedded under PAST receives an obligatory *double-access reading*, according to which Julia's pregnancy held at both the believing/claiming time (five years ago) and at utterance time (now), which is biologically impossible. The infinitival complements in (273c-d), by contrast, do not require a double-access interpretation, and permit the pregnancy time to be identified with the believing/claiming time. We thus cannot assume that these infinitival clauses are derived with any form of PRESENT:

(273) **Propositional infinitives that do not require double access reading (unlike PRESENT)**
a. #Five years ago, it was believed that Julia is pregnant.
b. #Five years ago, Julia claimed that she is pregnant.
c. Five years ago, Julia was believed to be pregnant.
d. Five years ago, Julia claimed to be pregnant. (Wurmbrand 2014, 432, ex.(58))

As before, Wurmbrand concludes that these infinitives are deeply tenseless. Once again, however, the Exfoliation/reverse engineering alternative permits these clauses to contain ancestral PAST. Since this instance of PAST is deleted by SOT, its presence may be posited in the reverse-engineering process without violating the strictures of PURE. Note that in the end, an infinitival clause that started its life with its tense specified as PAST ends up tenseless, just as in Wurmbrand's theory. The crucial difference is derivational. I am not proposing that infinitival clauses are intrinsically tenseless. Under the analysis suggested here, some are interpreted as containing PRESENT, since that tense is minimal — even though others do end up truly tenseless, thanks to SOT deletion of PAST.

(274) **Speaker and hearer summary: propositional infinitives under verbs like *believe* and *claim***
Speaker: free to posit any content whatsoever for T of the embedded clause (as before)[107]

106. Wurmbrand once again mentions the possibility that these infinitives might contain a "deleted PAST" (p. 432, fn. 25), but rejects this possibility as incapable of explaining "why the PAST must always delete, and how this is [im]possible [*correcting a probable typo*] in non-SOT contexts (e.g. *Julia claims to be pregnant* cannot mean 'Julia claims that she was pregnant'). In the logical structure of the alternative suggested here, it is PURE that fills this explanatory gap. Undeleted (and unselected) PAST is not semantically minimal, and therefore cannot be posited by the hearer in the process of reverse-engineering the derivation that produced an infinitival complement by Exfoliation.

107. By "any content whatsoever", I mean any content compatible with the rules that govern speaker's derivations. Thus, for example, as a reviewer notes, the fact that a verb such as *plan* requires a semantically future complement will impel the speaker to include a form of *woll*. I should also note that some verbs impose post-Exfoliation selectional requirements that reject derivations in which Exfoliation has not created a nonfinite clause, as discussed in previous chapters. Such requirements also restrict the speaker's derivation.

Hearer (restricted by PURE):

a. Hearer may not posit a modal because none is selected.

b. Hearer may posit PRESENT as the pre-Exfoliation tense of the future modal because it is semantically minimal (as we saw in discussing AUX-drop), yielding *will* (as before).

c. Hearer may posit PAST as the pre-Exfoliation tense of the future modal so long as it is semantically inert due to SOT (as is always the case with *would*) (as before).

7.2.4 *Why do propositional infinitives show only one side of the factative effect?*

I have suggested that AUX-drop and infinitival complementation tell a unified story about the effects of PURE. On one important point, however, the two discussions seem to point in different directions. In this section, I will suggest a way to reconcile them, though much remains to be worked out.

The factative effect for AUX-drop permits a silenced T to be understood by a hearer as PAST when the verb phrase it embeds is eventive, but not when it is a non-eventive. I suggested in section 7.1.2 that PAST is available with an eventive verb phrase precisely because PRESENT is independently blocked with eventive predicates (unless they are understood as habitual or generic). For this reason, PURE permits the hearer to reverse-engineer a derivation in which the tense of the unpronounced auxiliary verb in C has the value PAST. This is the minimally semantically contentful choice compatible with the morphosyntactic environment. Why then do we not find a similar effect with propositional infinitives, where the same logic should permit a PAST interpretation for the embedded infinitival clauses of examples like (271b-c)?

(275) **AUX-drop vs. propositional infinitive PAST-tense possibilities**

a. You see John yesterday? (AUX-*drop*)
'Did you see John yesterday'

b. *We believed Mary to see John yesterday. (*propositional infinitive*)
intended: 'We believed that Mary saw John yesterday.'

c. *Sue claimed to see John yesterday.
intended: 'Sue claimed that she saw John yesterday.'

An important clue may lie in a fact pointed out to me by Susi Wurmbrand (personal communication). In propositional infinitives like those under discussion here, simple PAST can actually be overtly expressed by the use of auxiliary verb *have* plus the past participle — a combination that is obligatorily interpreted as perfect tense in clauses that remain finite:

(276) **Propositional infinitives in which *have*+participle → PAST**

a. They believe(d) Mary to have seen John yesterday at 8:00.

b. They claim(ed) to have sung in the shower yesterday at 8:00.

c. They believe(d) [Bill to have known German when they were young].

d. They claim(ed) [to have known German well when they were young].

Independent of the puzzle of (275), the facts in (276) present an additional challenge to an Exfoliation approach to non-finite clauses — since they display another unexpected difference in the semantics of finite clauses and their infinitival counterparts. I suggest that solving the puzzle of (276) may help solve the puzzle of (275) as well.

The nature of the English perfect tense is a hotly debated topic, but it appears that one of the several hypotheses still in the running (recently defended by Klecha 2016) is the claim that auxiliary HAVE-*en* is a realization of PAST, yielding present perfect interpretation when the T that selects it is PRESENT, and

pluperfect interpretation when that T is PAST (see Grønn and von Stechow 2021, section 3 (esp. 3.1), for discussion and summary). Suppose we accept this proposal. We must now ask why HAVE-*en* cannot be used as the sole tense-denoting element in a finite clause, which would incorrectly permit a sentence like *They have seen John* to be understood as a simple PAST-tense utterance, rather than a perfect. Let us imagine that an English clause must obey the following surface filter on the featural content of T:

(277) **T-Valuation Filter**
*T unless specified for PAST or PRESENT

In a clause that contains T throughout the derivation, HAVE-*en* will never be able to serve as the sole bearer of tense. In any such clause, T must be PAST or PRESENT so as to not violate (277).[108] The combination of T with HAVE-*en* will thus produce the semantics of pluperfect or perfect tense, depending on the value of T chosen.[109]

If, however, T is eliminated by Exfoliation, then even if it was never valued PAST or PRESENT, it should not produce any sense of deviance: an instance of "salvation by deletion". Such a derivation will produce no detectable violation of (277) precisely because the T that might have violated the filter is no longer present at the end of the derivation (after Exfoliation). This is why HAVE-*en* may be the sole bearer of PAST in an infinitival clause, explaining the pure PAST-tense interpretation available to the embedded clauses of (276).[110]

Returning now to the puzzle in (275), we might explain the unavailability of a PAST interpretation for a propositional infinitive as the result of the hearer's strategy in (278):

(278) **Constraint on hearer's ability to posit PAST in an infinitival clause**
Because PAST can be overtly expressed in an infinitival clause, the hearer will assume that speaker would have expressed it overtly (using HAVE-*en* if PAST interpretation had been intended — and will therefore never posit PAST as a value for T in the absence of HAVE-*en*.

This proposal conforms to the spirit of PURE, since it continues to enforce unambitiousness when the hearer considers positing unpronounced material — but does not directly follow from it as stated. I leave that as a problem for future work. Crucially, note that (278) concerns PAST-tense *interpretation*, and there-

108. In constructions in which HAVE-*en* is embedded under an epistemic modal, its interpretation as PAST is extremely salient, e.g. *Sue must have seen John yesterday at 8:00*. HAVE-*en* is not the sole bearer of tense here, however. Though *must* does not show a morphologically overt PRESENT~PAST alternation like *can~could,* we may presume that it is specified as PRESENT, and that (277) is therefore satisfied. I am grateful to Asia Pietraszko (personal communication) for raising this point. As Athulya Aravind (personal communication) notes, future perfect constructions make the same point even more clearly, e.g. *Sue will have seen John yesterday at 8:00*. Here of course, we have independent evidence that *will* includes a second instance of tense (*woll* + PRESENT); cf. *They claimed that Sue would have seen John by then* (with *woll* + PAST).

109. The SOT rule does delete the PAST or PRESENT feature of T, and might be understood as producing a violation of the T valuation filter as stated in (277) — but the rule also binds the tense specification of the T that undergoes that rule to that of the T that triggered the rule. I will assume that for this reason a T that undergoes the SOT rule still counts as "specified" and does not violate (277).

110. Perfect interpretation is also possible. For example, *Mary lived here for many years* differs from *Mary has lived here for many years* in implying that she no longer lives here, but *I believe Mary to have lived here for many years* permits this reading.

fore still does not prevent the hearer from positing a PAST specification for T that is deleted at LF by the SOT rule, as discussed in preceding sections.[111]

The most important question facing us now, however, concerns AUX-drop. Why doesn't (278) prevent the hearer from posit PAST as an underlying value for T in an AUX-drop clause with an eventive predicate, as it does in a propositional infinitive? The answer is in fact straightforward. In AUX-drop as analyzed above (building on Fitzpatrick's proposals), T is never deleted. No exponent of T is heard by the hearer, true — but that is not because T has been deleted, but because T-to-C movement has applied and the contents of C were not interpreted by the phonology. In an AUX-drop question, T is present throughout the derivation, so no end run around (277) occurs (no "salvation by deletion"). As a consequence, HAVE-*en* can never be the sole bearer of tense in an AUX-drop clause, as illustrated by (279).

(279) **HAVE-*en* in AUX-drop yields present perfect meaning only (not PAST)**

a. *Mary written that message yesterday at 8:00? (*attempt at* PAST)

b. Mary written that letter yet? (*present perfect*)

To summarize: though both entail non-pronunciation of an exponent of tense, AUX-drop and infinitivizing instances of Exfoliation are quite distinct processes. AUX-drop involves mere non-pronunciation of T in C, while infinitivizing Exfoliation involves actual removal of T from the derivation. Their divergent behavior faced with an eventive predicate, seen in (275), follows from this difference. The T of clause that ends up non-finite may violate filter (277) without incurring any penalty. This in turn makes it possible for HAVE-*en* to produce a clause with simple PAST semantics, a possibility that prevents the hearer from positing PAST as the underlying specification for pre-Exfoliation T in an infinitival clause without violating PURE, given (278). The T of an AUX-drop clause is never deleted. Consequently filter (277) prevents HAVE-*en* from ever being the sole tense in the clause, (278) is never invoked, and PAST interpretation for an eventive VP is compatible with PURE. At the same time, though AUX-drop and infinitivizing instances of Exfoliation differ in this way, they impose a common burden on the hearer, who is faced in both cases with unpronounced instances of otherwise pronounced structure — hence their core similarity: the fact that T cannot be blithely posited as bearing the value PAST for a non-eventive predicate, unless later deleted by SOT, but can only be identified as PRESENT (or tenseless, when an end run around (278) is made possible by Exfoliation).[112]

7.2.5 *Predicates imposing simultaneity*

Finally, we must take note of a third class of predicates discussed by Wurmbrand. These take infinitival complements, some of which have propositional semantics — but are fully compatible with eventive predicates and PAST interpretation of the complement — so long as the selecting predicate is itself PAST tense.

(280) **Predicates imposing their reference time on infinitival complement: PAST**

a. Yesterday, John tried/began . . . /managed . . . to sing (*tomorrow/*next week).

b. The bridge began/seemed to tremble (*tomorrow/*next week).

(Wurmbrand 2014, 436, ex.(66))

111. Interestingly, I do not believe SOT applies to instances of PAST whose sole exponent is HAVE-*en*. *Mary claimed to have been happy* lacks any reading in which happiness time overlaps claiming time. This too makes (278) irrelevant for cases in which I have proposed that the hearer may posit PAST as a pre-Exfoliation value for T without violating PURE because it is deleted by SOT (and thus counts as semantically minimal). Why SOT fails to apply to HAVE-*en* in the first place, however, is unclear to me. Carlo Geraci suggests that SOT might be more generally constrained to apply only across a clause boundary. This would also explain why PAST T + HAVE-*en,* e.g. *Mary had written the letter already*, can only be understood as a pluperfect, and not a present perfect, as one might expect if the PAST semantics of HAVE-*en* could be deleted at LF by the SOT rule.

112. Should tenselessness outcompete PRESENT as a value for T that may be assumed by a hearer reverse-engineering a propositional infinitive? If both count as maximally unambitious possibilities (total absence of value vs. value linked to always-available utterance time), the answer should be no — but some sharpening of the statement of PURE might be necessary.

Substituting PRESENT tense for PAST eliminates the possibilities seen in (280):

(281) **Predicates imposing their reference time on infinitival complement: PRESENT**
a. *John seems to sing right now.
b. John seems to know German. (cf. Wurmbrand 2014, 437)

Wurmbrand concludes that in the usage seen in (280), at least, these are "matrix predicates [that] impose their reference time as the reference time of the embedded infinitive" (p.437). Once again, she proposes that these infinitival complements are deeply tenseless. Once again, the very fact that the matrix predicate imposes its reference time on the embedded infinitive can be understood as licensing the hearer to posit the corresponding tense specification as part of the pre-Exfoliation derivation of the complement clause, as permitted by PURE.[113]

7.3 The feasibility of PURE accounts

This chapter has suggested an alternative to Wurmbrand's (2014) analysis of English infinitives as inherently tenseless. This analysis is not merely compatible with the Exfoliation approach to infinitivization that I proposed in Pesetsky (2019), but also helps resolve a paradox lurking in the overall approach: the fact that infinitival clauses did not seem to present a derivational opacity argument for Exfoliation from tense semantics parallel to the argument they offer from case morphology in examples like (37a-b) and (59). While NOM morphology survives the deletion of its finite T assigner, PAST tense and modal semantics in T does not.

If the proposal sketched here is correct, semantics does present a comparable derivational opacity argument in principle — but we are prevented from seeing it clearly by PURE, which prevents us as hearers from attributing non-minimal semantic content to a tense or modal that has been deleted by Exfoliation. An additional argument for this approach came from the English AUX-drop construction, where PURE resolves a key contradiction arising from Fitzpatrick's otherwise optimal account.

If this style of explanation is fruitful, we should ask whether there are other problems and paradoxes that might be resolved by permitting the class of producible derivations to misalign with the class of reverse-engineerable derivations, as we have proposed in this chapter. I have suggested that certain problems might be resolved if certain derivations producible by the speaker may not be reproduced by the hearer. Perhaps other problems might be resolved in the opposite manner, if the reverse engineering process hosted by the hearer permits options that are in fact barred for the speaker. For example, imagine that when the hearer attempts to reproduce the syntactic derivation of the speaker, they are free to ignore EPP features, so that a raised nominal in the speaker's utterance might remain unraised in the reverse-engineered hearer's derivation. In this respect, the hearer's reverse engineering might show some ambition after all — in its reconstruction of the speaker's syntax, if not their semantics. This might be an approach to reconstruction phenomena worth exploring. Conversely, if one imagines that the hearer is free to assume EPP features not present in the speaker's derivation, one might be led to a new view of phenomena normally viewed as covert movement internal to the speaker's syntactic derivation. I will leave the question of whether these are (or are not) promising avenues of investigation open.

113. Wurmbrand also discusses contexts in which predicates such as *seem* behave more like *believe*, which I will not summarize here. I believe the results of this discussion can be incorporated in the alternative advanced in this chapter without change.

Summing up

In this work, I have argued for a derivational view of clause size. On this view, all embedded clauses are generated by the syntax as full and finite CPs. Infinitival and other nonfinite clauses are the result of the rule of *Exfoliation*, which strips away the outer layers of a finite CP, leaving behind an infinitival clause — under very specific circumstances: namely, when a probe external to CP finds a goal internal to that CP that does not occupy its edge. Exfoliation eliminates as many clausal layers as is necessary to place that goal at the edge of what remains, so it can interact with that goal. Arguments from several directions were advanced to support this proposal.

First, I argued that paradigms of acceptability for infinitival complementation do indeed correlate with probe-goal relations across the clause boundary. Whenever a probe capable of triggering Raising successfully contacts an element in the specifier of *to*P across a CP boundary, that CP is reduced to an infinitive — but not otherwise. Other more complex arguments reinforced the claim that the distribution of infinitival complements reflects conditions on Exfoliation rather than factors such as subject case licensing traditionally claimed to be at work in these paradigms.

A second type of argument advanced for this proposal was the fact that it generalizes to configurations in which a probe finds a goal occupying a position higher than the specifier of *to*P. When this happens, the embedded clause is once again reduced by Exfoliation — but now to something larger than an infinitive. This provides an account of the well-known *complementizer-trace effect* — in which an otherwise possible overt complementizer is obligatorily absent when a subject or subject-like phrase is extracted, leaving behind a clause that lacks its complementizer but remains finite. If the overall proposal is correct, the explanation for complementizer-trace effects falls together with an explanation for why nonfinite clauses should exist in the first place, uniting two phenomena previously viewed as quite distinct — one of the major claimed results reported in this work.

With much less detail, I also sketched how the overall approach could be extended to other domains that could be argued to exhibit size alternations, such as the active~passive alternation.

Many points in the discussion presented us with derivational opacity arguments for the proposal that infinitival clauses are born full and finite: circumstances that reveal the action of processes one of whose key ingredients is missing in the surface form, but was present at an earlier stage of the derivation, if the Exfoliation approach is correct. This challenged us to investigate the apparent absence of such an argument for the semantics of exfoliated clauses — in particular, infinitival complements. In the preceding chapter, it was argued that the characteristically restricted semantics of nonfinite complements reflect general limitations on the richness of the pre-Exfoliation structures that a hearer can reverse-engineer, faced with a surface form produced by a hearer that in principle could be compatible with a rich variety of semantic possibilities. With that proposal in place, we saw that there was a kind of derivational opacity argument for nonfinite clausal semantics to be had after all.

Much work obviously remains to be done to justify and develop the Exfoliation proposal, to put it on a firm conceptual and empirical footing. Some relevant topics I have explored in a fair amount of depth, but others I have just touched upon to provide proof of concept. At the very least, however, I hope that the discussion in this work can serve as a first step in the reopening of issues long considered closed — while simultaneously shedding light on other issues recognized as open, but unsolved. The Exfoliation proposal interacts with just about everything else in the domain of syntax, as we have seen, and the discussion in this work is clearly just a beginning.

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