

T-to-C Movement: Causes and Consequences

David Pesetsky
Dept. of Linguistics and Philosophy
Massachusetts Institute of Technology
pesetsk@mit.edu

Esther Torrego
Linguistics Program, Dept. of Hispanic Studies
University of Massachusetts/Boston
torrego@umbsky.cc.umb.edu

January 5, 2000

To appear in Michael Kenstowicz, ed. (2000) *Ken Hale: a Life in Language*. MIT Press.

1. Introduction*

The research of the last four decades suggests strongly that abstract laws of significant generality underlie much of the superficial complexity of human language. Evidence in favor of this conjecture comes from two different types of facts. First, there are cross-linguistic facts. Investigation of unfamiliar and typologically diverse languages is regularly illuminated by what we already know about other languages. This could only be the case if languages shared a significant substrate of laws. This is the kind of work for which Ken Hale is best known, and which we honor with this volume. In addition, there are facts about individual languages that closely mirror what we discover through cross-linguistic investigation. Just as investigation of unfamiliar and diverse languages is regularly illuminated by what we already know about other languages, so the investigation of unfamiliar and diverse *structures* within a single language is regularly illuminated by what we already know about other structures within that language. Again and again, we are led to suspect that an apparent peculiarity of some particular structure is just a special case of a phenomenon characteristic of some entirely different structure. By now, many investigations of this sort have been reported, providing us with strong reasons to suspect that language is indeed governed by abstract laws.

Once one suspects the existence of laws governing a variety of phenomena, the next step should be a search for the laws themselves. In fact, however, "next step" research of this sort does not always happen. Often, an exciting connection is posited between apparently unconnected facts, a hypothesis is developed and investigated for a while — and then abandoned, not because it is disconfirmed, but because new results stop coming. The attention of the field turns elsewhere.

To pick one example, the theory of abstract case developed in the late 1970s (Rouveret and Vergnaud 1979; Chomsky 1980, 1981) provided a unified explanation for a set of contrasts between DPs and other categories, such as CP. The central observation was the fact that the distribution of DP is restricted in a way not observed with CP (and other non-DPs). For example, English CPs generally may move to Spec,TP from the complement position of unaccusative and passive verbs, but are not required to do so. DPs, however, must undergo this movement:

- (1) **Abstract case: DPs vs. CPs as complements of passive verbs**
 - a. [_{CP} That Sue would arrive late] was expected.
 - b. It was expected [_{CP} that Sue would arrive late].
 - c. [_{DP} Sue's late arrival] was expected.
 - d. *It was expected [_{DP} Sue's late arrival].
- (2) **Abstract case: DPs vs. CPs as complements of unaccusative verbs**
 - a. [_{CP} That Sue would arrive late] appealed to us.
 - b. It appealed to us [_{CP} that Sue would arrive late].
 - c. [_{DP} Sue's late arrival] appealed to us.
 - d. *It appealed to us [_{DP} Sue's late arrival].

The theory of abstract case explained these contrasts as a corollary of the fact that DPs in some languages are often required to display case morphology, while (in many languages, at least) CPs do not. It was suggested that even DPs without overt case morphology must bear abstract case, and that this property is assigned (or licensed) in particular syntactic positions — for example, in the specifier of TP, but not in object position of a passive or unaccusative verb. Though this generalization, and its extension to other syntactic contexts, was important to the understanding of a range of phenomena, fundamental questions

remained unanswered, including *why* DPs must bear case and move for case reasons, while CPs do not have to. What might have been an ongoing research program devoted to these and related questions did not materialize.

A similar fate met another major research topic of the late 1970s and early 1980s: the investigation of subject/non-subject asymmetries, such as the *that*-trace effect (Perlmutter 1971). This effect is observable in many dialects of English as the obligatory absence of *that* introducing a CP from which the subject has been extracted:

- (3) **That-trace effect (Perlmutter 1971)**
a. Who do you think (that) Sue met ___?
b. Who do you think (*that) ___ met Sue?

In research of the late 1970s and 1980s, this effect was most often attributed to a local binding requirement on subject traces — the *Empty Category Principle* (ECP). The presence of the word *that* in examples like (3b) was taken to block a crucial government relationship between the subject trace and some element in the C-system (In some accounts, the relevant member of the C-system was C itself (e.g. Rizzi 1990). In others, it was an intermediate trace of successive-cyclic *wh*-movement (Kayne (1980a); Taraldsen (1979); Pesetsky (1982a).)

As work on this effect progressed, researchers discovered other subject-object asymmetries. Attempts were made to relate these new discoveries to the *that*-trace effect, often through revisions in the formulation of the ECP. Stowell (1981; cf. also Kayne 1980b), for example, noted that the word *that*, which is optional in complement clauses, is obligatory in subject clauses, and suggested an account that relates this fact to a revised ECP. The key to his proposal was the idea that when *that* is missing, an unpronounced element subject to the ECP stands in its place:

- (4) **That-omission asymmetry (Stowell 1981)**
a. Mary thinks [that Sue will buy the book].
b. Mary thinks [Sue will buy the book].
c. [That Sue will buy the book] was expected by everyone.
d. *[Sue will buy the book] was expected by everyone.

In a similar vein, Koopman (1983) discussed an important asymmetry in the movement of a tensed auxiliary verb from T to C (Den Besten 1978/1983) in English matrix *wh*-questions, and suggested that this asymmetry is also due to the ECP. T-to-C movement is obligatory in questions when the nearest subject is not the phrase *wh*-moved to Spec,CP — and is impossible otherwise:

- (5) **T-to-C asymmetry (Koopman 1983)**
a. What did Mary buy?
b. *What Mary bought?
c. *Who did buy the book? [*unless *did* is focused]¹
d. Who bought the book?

Koopman proposed that the presence of T in C in (5c) blocks the government relationship between the trace of *wh*-movement in subject position and the new location of the *wh*-phrase in Spec,CP.² She did not offer an account of (5b) — whose status we return to later.

The research on subject/non-subject asymmetries of two decades ago was exciting because it promised a unification of diverse phenomena of just the sort described above. Indeed, Koopman's unification of the T-to-C asymmetry with the *that*-trace effect provided inspiration for our own research

reported here, as will become apparent. In actual practice, however, the work of the late 1970s and early 1980s met obstacles that were not successfully overcome at the time. Some were technical. For example, it was never clear why *that* or *did* in (5c) should block government of the subject trace from Spec,CP (though various possibilities were explored).³ It was also not clear why the presence of *that* should have the effect on subject traces that it does in (3), while failing to produce a similar effect on other traces plausibly in need of government — for example adjuncts. Here too, proposals were explored (most notably by Lasnik and Saito 1984; 1992), but many questions remained. More serious, however, was the overall failure of ECP research to *explain* why subjects should have a special binding requirement in the first place — a requirement from which many or most non-subjects were exempt. The ECP stipulated this difference, and various attempts were made to rationalize it (by Kayne 1980b, Stowell 1981, and Rizzi 1990, among many others) — but a deeper explanation was never found. In the end, it is fair to say, most of the field abandoned the project. These once-central topics became the periphery of the field, and research attention shifted to other topics.⁴

The shift to other topics was not, we think, unreasonable. We suspect that during the period when research on subject/non-subject asymmetries flourished, the ideas and analytic tools crucial to a true understanding of their nature had not been developed. We believe, however, that the situation has changed over the past decade. **We believe that the ideas and tools necessary to an understanding of the sources of subject/non-subject asymmetries have been developed.** That is the main topic of this paper. We take up the three subject/non-subject asymmetries just discussed, along with several related asymmetries, and offer a new explanation in light of recent work. We also argue, however, that the correct theory of subject/non-subject asymmetries offers new answers to other questions left open in the 1980s — including several questions about abstract case (as summarized earlier). We begin with a review of the new ideas that will be crucial to our investigation.

A particularly important development of the past decade is the hypothesis that **movement is not optional** (the working hypothesis of the early 1980s) — but *triggered*. The version of this hypothesis most important here is Chomsky's (1995, Chapter 4) proposal that **uninterpretable features play a key role in the triggering process**. Uninterpretable features of a lexical item are properties of the item that make no semantic contribution. Examples include person and number on T (or *wh* on C). **Person and number features (the so-called " -features")** make a semantic contribution when they are found on DP or CP (McCloskey 1991), but make no semantic contribution on T.

Although it is difficult to know *why* lexical items bear uninterpretable features, their existence is a fact. Chomsky's novel conjecture amounts to the suggestion that it is an important fact. He proposed that uninterpretable features must delete and disappear by the end of a syntactic derivation — where the derivation is assumed to build structure from "bottom to top". Deletion of an uninterpretable feature F on a lexical item X can happen when another element Y also bears F, and X establishes a syntactic connection with Y. The simplest connection is the operation that Chomsky (1998) calls *Agree*.⁵

In some instances, an uninterpretable feature F on X requires that an Agree relation with F on Y be followed up with copying of material from Y into the local environment of X. This property of F is called an "*EPP property*".⁶ Agree that is followed up by a copy operation (motivated by a EPP property) is the composite operation called *Move*. When a feature F on X enters into an Agree or Move relation with another instance of F on Y, we will say that F on X *attracts* Y.⁷ For example, *wh*-movement arises when an uninterpretable *wh*-feature on C (henceforth ***uWh***) attracts a *wh*-phrase and *uWh* has the EPP property. The *uWh* feature on C enters into an Agree relation with the *wh*-phrase. The EPP property of *uWh* then requires copying of the *wh*-phrase, forming a specifier of CP.

The hypothesis that movement is "triggered" amounts to the claim that an element Y moves *only* when attracted by a feature (of some head X) with the EPP property. More generally, heads enter into Agree and Move relations only to the extent necessary. We can summarize this as the Economy Condition in (6):

- (6) **Economy Condition**
A head H triggers the minimum number of operations necessary to satisfy the properties (including EPP) of its uninterpretable features.

Another point worth noting: it will be important that EPP is a property of a *feature* of a head — not a property of the head itself. Thus, a head that bears features F and G might have the EPP property for F, but not for G. In this sense, EPP is a "subfeature of a feature", in the sense familiar from feature geometry in phonology.

Once an uninterpretable feature F on X has attracted Y, F is said to be "*deleted*". We will sometimes use the clumsier phrase "*marked for deletion*" because (as we shall see) the final disappearance of F on X may be delayed until a later point in the derivation. For example, the final disappearance of an uninterpretable feature marked for deletion may quite regularly wait until the completion of a CP (or other category called a "phase" by Chomsky 1998, 1999). We will argue that under some circumstances the lifespan of a feature marked for deletion can be longer.

To summarize: the three points of importance to our account of subject/non-subject asymmetries are: (1) the hypothesis that uninterpretable features must disappear by the end of the derivation; (2) the hypothesis that movement occurs only in response to an uninterpretable feature with the EPP property; and (3) the hypothesis that a feature may remain "alive" for a while after being marked for deletion. The italicized terminology presented in the preceding paragraphs indicates the concepts to keep in mind throughout this paper.

We now begin our investigation of subject/non-subject asymmetries in the context of these ideas about Agree and Move. The discussion of subject/non-subject asymmetries in the 1980s took as its starting point the *that*-trace phenomenon in (3). We will start instead with the T-to-C asymmetry in (5), because we believe it is the key to understanding all three asymmetries. If Chomsky's hypotheses about movement are correct, then the movement of T to C in (5a) must be a response to the presence of an uninterpretable feature with the EPP property on C and the presence of a corresponding feature on T. We will make the simplest, most banal proposal about the nature of this feature that is consistent with the hypothesis about movement that we have adopted. The interest of the proposal lies not in (7) itself, but in its consequences:

- (7) **Motivation for T-to-C movement [in English matrix interrogative clauses]⁸**
C bears an uninterpretable T feature (henceforth *uT*) with the EPP property.

2. The T-to-C asymmetry and the nature of nominative case

Our most obvious task is to explain the contrast between sentences like (5c-d), in which a local nominative *wh* is moved to C — which do not show T-to-C movement — and sentences like (5a-b), in which another phrase undergoes *wh*-movement — which do show T-to-C movement. Why we do not find T-to-C movement when the local nominative subject undergoes *wh*-movement in (5c-d)? In the acceptable (5d), the *uWh* feature of C is deleted by the *wh*-phrase that has been moved into its specifier.⁹ But what deletes the *uT* feature on C when T-to-C movement does *not* take place? It is here that we make a key new proposal in this paper. We suggest that *uT* on C in (5d) is deleted by the nominative *wh*-phrase itself. More generally, we propose (8):

- (8) **The nature of nominative case**
Nominative case is uT on D.

Since the features of the head are shared by its projections, a nominative DP moved to Spec,CP can delete uT on C in the same way that T moved to C can — if (8) is true. That is why T-to-C movement is unnecessary in examples like (5d). Note that this is a situation of the sort mentioned in the previous section, in which the uT feature of the subject DP remains "alive" and accessible to further operations at least until CP has been fully built (Chomsky's 1998 notion of "phase") — despite having been marked for deletion by T itself. At the point in the derivation at which CP is built, the nominative subject has already been attracted to Spec,TP by finite T, since English finite T bears uninterpretable $-features (u$, realized in some cases as agreement morphology) with an EPP property:

- (9) **Attraction to Spec,TP**
[TP [DP subject, $\#T$,]_i [T, $\#-$] [t -subject_i bought the book]]

The u -features on T are marked for deletion once a syntactic relationship has been established with DP's interpretable $-features$. This also allows the uT feature of DP to be marked for deletion — but, as we see, final erasure of this feature can be delayed at least as long as the CP cycle.¹⁰

Of course, T-to-C movement in examples like (5c-d) is not merely unnecessary, but *impossible*, as (5c) shows. We will suggest that the impossibility of T-to-C movement in (5c) is a consequence of the basic Economy Condition (6) that underlies the entire theory of syntactic operations adopted here. If a head has a choice among several patterns of movement that it might trigger, it picks the pattern with the least occurrences of movement.

To see this, however, we must first deal with an issue of locality raised by T-to-C movement in (5a-b). T-to-C movement does not, at first sight, seem to obey a locality condition familiar from *wh*-movement. We know from the phenomenon called the *Superiority Effect* that when a feature of C attracts *wh*, it attracts the closest instance of *wh* — a general principle that we can call "Attract Closest F" (ACF):

- (10) **Attract Closest F (ACF)** [simplified from Chomsky 1995, p. 296]
If a head K attracts Feature F on X, no constituent that bears F is closer to K than X.

Examples that show ACF for *wh*-movement include familiar contrasts like (11):

- (11) **Superiority Effect**
a. Who C [___ bought what]?
b. *What did+C [who buy ___]?

If *wh*-attraction by C obeys ACF, the same should be true of T-attraction by C. If so, why is it the head T, and not its maximal projection TP, that moves to C in (5a)? After all, fewer nodes separate C from TP than separate C from T. As it happens, however, there is another natural notion of "closeness" that might be relevant to ACF. If the metric of closeness involves c-command rather than node-counting (as we shall shortly argue), TP and T are equidistant from C, since domination is not a case of c-command:

- (12) **Closeness**
Y is closer to K than X if K c-commands Y and Y c-commands X.¹¹

Nonetheless, something more general must be at stake, since movement of TP to C is not even an option in examples like (5a). The structure of (5a) is special in a way that might be relevant. In (5a), *uT* on C is attracting a feature of its own complement — a constituent with which C has just merged. If the entire complement of C were to be copied as Spec,CP, C would, in effect, be merging with the same constituent twice. We suggest that it is precisely in these circumstances that the head of the complement, rather than the complement itself, is copied. In the present context, this suggestion is speculative, but it is in fact the flip side of a more familiar generalization: the Head Movement Constraint of Travis (1984). Travis's condition states that head movement is always movement from a complement to the nearest head. Our condition dictates that movement from a complement to the nearest head is always realized as head movement. We may call the two together the "Head Movement Generalization":

- (13) **Head Movement Generalization**
 Suppose a head H attracts a feature of XP as part of a movement operation.
 (i) If XP is the complement of H, copy the head of XP into the local domain of H.¹²
 (ii) Otherwise, copy XP into the local domain of H.

If (13) is correct, T-to-C movement in (5a) is the expected consequence of *uT* on C attracting a feature of its complement TP.

Now let us return to the impossibility of T-to-C movement in (5c) in light of the proposal that T-to-C movement results when a feature of C attracts a feature of TP, and in light of the proposal that the metric of closeness involves c-command rather than node-counting. Consider the structures underlying (5a-b) and (5c-d) immediately after merger of C, assuming (8). We omit the *-*features for clarity:

- (14) **Structures for (5) before movement to C and Spec,CP**
 a. [C, *uT*, *uWh*] [TP [*Mary*, *uT*] T [_{VP} *bought what*]] [(5a-b)]
 b. [C, *uT*, *uWh*] [TP [*who*, *uT*] T [_{VP} *bought the book*]] [(5c-d)]

In (14a), the closest element that bears *wh* is *what*. Both the nominative subject and T are closer to C than *what*. Consequently, C must delete its *uWh* feature and its *uT* feature in two separate operations. That is why we see both *wh*-movement and T-to-C movement in (5a-b).

The situation is different in (14b). If the metric of "closeness" is as in (12), TP and its nominative specifier both count as the closest constituent to C. Consequently, C can (in principle) choose whether to delete its *uT* feature by attracting TP or by attracting the nominative Spec,TP.¹³ If C attracts TP (yielding T-to-C movement), it deletes just one of its two uninterpretable features as a consequence of this operation. A separate operation is necessary to delete its *uWh* feature. If, on the other hand, C attracts the nominative Spec,TP, both *uT* and *uWh* can be deleted in one step, since the phrase in Spec,TP has nominative case and is a *wh*-phrase.¹⁴ The more economical choice is made. Hence, in (14b), C attracts Spec,TP and does not attract TP itself. This accounts for the contrast in (5c-d).

Hypothesis (8), which identifies nominative case with *uT*, is crucial to our explanation of the T-to-C asymmetry. It is this hypothesis that helps us understand why movement of the subject to Spec,CP "does the same job" as T-to-C movement. Hypothesis (8) will play an important role in the explanation of the subject/non-subject asymmetries discussed throughout this paper. It is therefore worth pausing to consider its nature and consequences. First, we should note that (8), though new, is not radical. It amounts to the proposal that there is a close correspondence between the features of finite T and the features of nominative D. We are used to the idea that T (and its projections) bears features that are uninterpretable on it but would be interpretable were they found on D (e.g. person and number). Hypothesis (8) is simply the proposal that the reverse is also true. D and its projections bear features that

are uninterpretable on it but would be interpretable were they found on T. We call the features proper to D "agreement" when borne by T, and we call the features proper to T "nominative" when borne by D — but hypothesis (8) suggests that the traditional terminology is misleading. "Agreement" is the name for the D-properties present on T, and "nominative" is the name for the T-properties present on D.

This aspect of hypothesis (8) is interesting for a more general reason. One of the most long-lasting controversies in linguistics concerns the existence of purely formal grammatical features — features utterly without semantic value. The most "minimalist" possible position would hold that such features do not exist — that the lexicon contains nothing but pairs of sounds and meanings. This position, dubbed "Extreme Functionalism" by Newmeyer (1998), is rarely defended, presumably because it is such an obvious non-starter. Lexical items often bear features that have no evident semantic import, and, it would seem, there is no getting around this fact. Nonetheless, one must ask how much of a counterexample to Extreme Functionalism such facts really are.¹⁵

Chomsky's (1995, Chapter 4) focus on the *interpretability* of features suggests to us an interesting new answer to this question — a minimal retreat from Extreme Functionalism that we can call "Relativized Extreme Functionalism". "Relativized Extreme Functionalism" agrees with its non-relativized predecessor that all grammatical features have a semantic value, but recognizes that they do not get a chance to express their semantic value in every context in which they occur. Of course, even "Relativized Extreme Functionalism" is untenable if there exist grammatical features that have no semantic value in *any* environment. If, for example, there is a feature called "nominative" whose only function is to mark certain Ds and DPs as capable of being attracted by finite T (as argued by Chomsky 1998),¹⁶ then even Relativized Extreme Functionalism is untenable. On the other hand, if nominative is simply an uninterpretable T-feature on D or DP, then the existence of nominative case is consistent with Relativized Extreme Functionalism. Hypotheses like (8) thus have an interest beyond their role in explaining phenomena like the distribution of T-to-C movement. They bear on central issues of linguistics.¹⁷

Although our unification of nominative case on DP and agreement on T may have conceptual appeal, from a morphological perspective it is not (perhaps) the most obvious proposal. The idea that agreement morphology on T realizes uninterpretable features otherwise found on DP makes sense, since the actual shape of agreement morphology often co-varies with the particular feature values borne by the nominative DP that T attracts. That is why this morphology is called "agreement". We do not generally find comparable co-variation between the shape of nominative case morphology and particular feature values borne by the T that attracts the nominative phrase. For example, we do not often find the morphology of nominative case co-varying with choice of present, past or future tense. This mismatch may reflect an inherent morphological asymmetry between attractor and attractee,¹⁸ or it might indicate that the features we are calling "T" are more properly analyzed as some other member of the Tense-Mood-Aspect system. We will not attempt to explain the mismatch, and will leave it as an open problem. We do, however, know of two instances in which nominative case morphology reflects T in a more direct way than it does in languages like English. We mention them briefly here.

The first case, brought to our attention by Ken Hale (p.c.), comes from Pittapitta, one of the Wellesley Island languages of North Queensland, Australia (Hale 1998a, Hale 1998b). In this language, future tense is marked on the nominative subject DP.

(15) **Pittapitta future tense marked on nominative DP**

- a. Ngapiri-ngu thawa paya-nha.
father-FUT kill bird-ACC
'Father will kill the bird (with missile thrown).'
- b. Thithi-ngu karnta pathiparnta.
EBro-FUT go morning
'My elder brother will go in the morning.'

In other tenses, no tense is marked on any nominal. Also, no tense is ever marked on non-subject nominals (a feature that distinguishes Pittapitta from neighboring languages that display "case spreading"):

- (16) a. Ngathu manhakurri-nya puri-nha.
1SG.ERG mishandle-PAST money-ACC
'I lost (my) money.'
- b. Ngamari-lu takuku-nha wajama-ya.
mother-ERG child-ACC wash-PRES
'Mother is washing the baby.'

Classical Arabic represents an interesting case of a different sort. Here we do not see co-variation between the tense of the sentence and the morphology of the nominative subject, but we observe something else of interest. **The suffixes that mark nominative case are identical to the "mood" morphology of the imperfective indicative verb** across all three numbers, and have traditionally been viewed as one system by the Arab grammarians (Benmamoun 1992; to appear):¹⁹

(17) **Classical Arabic**

<i>Singular</i>	<i>Dual</i>	<i>Plural</i>
a. T-Taalib- u the-student-Nom	c. T-Taalib- aan the-student-Dual-Nom	e. l-mu9allim-uun the-teacher-Pl.Nom
b. ya-ktub- u 3m-write-Ind	d. ya-ktub-aan 3m-write-Dual.Ind	f. yu-9allim-uun 3m-teach-Pl.Ind

As we have seen, though we do not explain the overall asymmetry between the morphology of uninterpretable nominal features on T and uninterpretable T features on nominals, there is some evidence from overt morphology that supports our hypothesis that these features are fundamentally the same.

What about structural case more generally — in particular, accusative case? In this paper, we focus on nominative, and do not argue for any particular hypothesis about accusative. It is clear, however, that plausible hypotheses in the spirit of (8) can be formulated (and should be investigated, if we are to maintain Relativized Extreme Functionalism as a working hypothesis). For example, it is quite possible that accusative is also *uT* on D — in which case, *uT* is the proper characterization of "structural case" in general.²⁰ If accusative case is also *uT* on D, finite T must be capable of Agree and Move relations with more than one DP, to allow for sentences containing both nominative and accusative DPs. T would then resemble the C used in multiple questions, which seems to enter into such relations with more than one *wh* (Pesetsky 2000). In languages that make a morphological distinction between nominative and accusative, the choice of case morphology would be taken to reflect the order in which the DPs enter into an attract relation with T.²¹ Alternatively, **we might suppose that accusative case is an uninterpretable version of a different feature — perhaps an uninterpretable version of some feature associated with the *v* of Hale and**

Keyser (1993) and Chomsky (1995, Chapter 4), which assigns external thematic roles (or the aspectual projections of Borer (1998)). We leave the matter open.²²

3. The *that*-trace effect and the nature of English *that*

Is *uT* on *C* limited to interrogative clauses, or do other types of *C* also bear *uT*? The question is natural, particularly since *uT* on *D* (i.e. nominative case) is certainly not restricted to DPs with an interrogative interpretation. In fact, there might be good reason to find *uT* on non-interrogative *C*, especially when *C* attracts a *wh*-phrase as part of the phenomenon of successive-cyclic *wh*-movement. If our analysis of the T-to-C asymmetry is correct, the acceptable examples in (5) have an interesting property in addition to those already discussed. In every matrix question in which *wh*-movement was observed, some instance of movement to *C* took place from a position that is maximally close to *C*. When a phrase other than the nominative subject underwent *wh*-movement, T-to-C movement was the movement from a maximally close position that we observed. When the nominative subject itself underwent *wh*-movement, it was *wh*-movement itself that involved the maximally close position. This fact about (5) might hint at a more general law. Such a law might require one instance of any sort of movement to a head *H* to be strictly local, tolerating less local instances of movement to *H* only when strictly local movement has also occurred. This possibility strongly recalls the work of Richards (1997; 1998), who argued that "closeness" conditions like ACF in (10) obey a "Principle of Minimal Compliance":²³

(18) **Principle of Minimal Compliance (PMC) [simplified from Richards 1997]**

Once an instance of movement to *H* has obeyed a constraint on the distance between source and target, other instances of movement to *H* need not obey this constraint.

Let us examine how the PMC works. One of the most straightforward demonstrations offered by Richards concerns the distribution of Superiority Effects in Bulgarian. Recall that the Superiority Effect in English (seen in (11)) is an effect of ACF. This effect shows up in Bulgarian as an ordering restriction on multiple overt *wh*-movement to Spec,CP (Koizumi 1995). In multiple questions with two *wh*-phrases, the closest *wh*-phrase to *C* moves to form a Spec,CP; the next-closest *wh*-phrase "tucks in" underneath this first phrase to form an inner Spec,CP:

(19) **Superiority effect in Bulgarian multiple questions with two *wh*-phrases**

a. Koj kakvo viĭda?

who what sees

cf. *Who sees what?*

b. *Kakvo koj viĭda?

what who sees

cf. **What does who see?*

(Rudin 1988)

Strictly speaking, ACF should block sentences like (19a). Why can *C* attract the second *wh*-phrase at all, given that the second *wh*-phrase is not the closest *wh*-phrase to *C*? The answer to this question, according to Richards, falls together with the explanation of an even more surprising phenomenon: the behavior of multiple questions in which three or more *wh*-phrases move overtly. As before, the *wh*-phrase that starts highest must move first, and ends up left-most. The order of the other two *wh*-phrases, however, is free (as discussed by Bošković (1995)):

(20) **Superiority effect in Bulgarian multiple questions with three *wh*-phrases**

a. Koj kogo kakvo e pital? [wh₁ wh₂ wh₃]
 who whom what AUX asked

b. Koj kakvo kogo e pital? [wh₁ wh₃ wh₂]

The ordering options displayed in (20), combined with the issues raised by (19), suggest that the interrogative C of a multiple question — after attracting the nearest *wh*-phrase (wh₁) — must be free to disregard ACF thereafter. This is what the PMC allows. The PMC explains why C can attract other *wh*-phrases from further away, and why it can attract them in any order:²⁴

(21) **Derivation of (20b)**

before wh-mvt:

C [koj pital kogo kakvo]

step one: C attracts the *wh*-feature of *koj*.

koj C [__ e pital kogo kakvo]

step two: The PMC now allows C to attract either of the two remaining *wh*-phrases without regard to ACF. It tucks in under *koj*.

koj kakvo C [__ e pital kogo __]

step three: C attracts the other *wh*-phrase, which tucks in under *kakvo*.

koj kakvo kogo C [__ e pital __ __]

If the similarity between this scenario and the one observed in (5) is not an accident, then in addition to Attract Closest F, which prevents a head in search of a feature F from looking past the closest instance of F, there must be an independent, tighter constraint, *Attract Closest X (ACX)* — which prevents Attract operations from looking past the closest instance of *anything*:

(22) **Attract Closest X (ACX)**

If a head K attracts X, no constituent Y is closer to K than X.

Left to its own devices, ACX should prevent all but maximally local instances of movement,²⁵ but if ACX is subject to Richards' PMC, non-local movement to K will be possible when preceded by an instance of local movement to K. This is the case when T-to-C movement precedes *wh*-movement from inside VP:

(23) **Object *wh*-movement**

before T-to-C and wh-mvt:

[C, uT, uWh] [Mary [_T will] buy what]

step one: uT on C attracts TP; the resultant T-to-C movement satisfies ACX.

[_T will]+[C, #T, uWh] C [Mary __ buy what]

step two: uWh on C attracts *what*, which would be blocked by ACX if step one had not occurred first.

what [_T will]+[C, #T, #Wh] [Mary __ buy __]

If ACX is correct, then any C capable of attracting a *wh*-phrase from a position other than Spec,TP must bear uT in addition to uWh. This may be true. Consider long-distance *wh*-movement from an

embedded finite declarative clause to a higher interrogative CP. We begin with cases where the moved *wh*-phrase is object *wh*-phrase, like (24), where we focus our attention on the embedded clause:

- (24) What did John say [_{CP} that Mary will buy ___]?

Let us take it as established that movement of this sort must pass through the specifier of the embedded declarative CP.²⁶ In a feature-based theory of movement, this means that the embedded C must bear *uWh* (with the EPP property) so as to attract the *wh*-phrase.²⁷ The problem is, movement of a *wh*-phrase from anywhere other than Spec,TP violates ACX. If ACX is correct, we must assume that the embedded C in structures like (24) (that is, the C of matrix interrogatives) bears *uT*. Consequently, we expect movement of T to C to accompany successive-cyclic *wh*-movement. (Alternatively, movement of the nominative subject to Spec,CP accompanies the *wh*-movement, a topic to which we return).

In fact, we find T-to-C movement in just this environment in a variety of languages. One particularly clear example is Belfast English, as discussed by Henry (1995, 108-9). Belfast English shares with other dialects obligatory T-to-C movement in *wh*-interrogatives (and also allows inversion in embedded questions, as we discuss below). In addition, however, obvious cases of T-to-C movement are also found in clauses through which successive-cyclic interrogative *wh*-movement has passed:²⁸

(25) **Belfast English**

- a. Who did John hope [would he see ___]?
- b. What did Mary claim [did they steal ___]?
- c. I wonder what did John think would he get ___?
- d. Who did John say [did Mary claim [had John feared [would Bill attack ___]]?

Very similar data are found in Spanish²⁹ (Torrego 1983; 1984) and in French (Kayne and Pollock 1978), where the phenomenon is called *Stylistic Inversion*:³⁰

(26) **Spanish**

- a. A quién prestó Juan el diccionario?
to whom lent John the dictionary
- b. Con quién podrá Juan ir a Nueva York?
with whom will-be-able J. to go to NY
- c. Qué pensaba Juan [que le había dicho Pedro [que había publicado la revista]].
what thought John that him had told Peter that had published the journal
'What did John think that Peter had told him that the journal had published?'

(27) **French Stylistic Inversion**

- a. Qui a-t-elle dit qu'avait vu Paul?
who did she say that-had seen Paul
- b. l'homme avec lequel je crois qu'a soupé Marie...
the man with whom I believe that has

One might think that standard English poses a threat to our expectation that T-to-C movement may always accompany successive-cyclic *wh*-movement in questions. We will now show that this is not the case. It is at this point that we can begin to provide a unified explanation of the subject/non-subject asymmetries presented in section 1.

The argument comes from examples identical to (24), except that the nominative subject, rather than another phrase, has been *wh*-moved from the embedded clause. Here, as we have already seen, we find the so-called *that*-trace effect. The word *that* may introduce the embedded clause when a non-subject is *wh*-moved from it, but may not introduce the same clause when the nominative subject is *wh*-moved from it:

- (28) a. Who did John say ___ will buy the book?
b. *Who did John say that ___ will buy the book?



The *that*-trace effect is strikingly similar to the T-to-C asymmetry discussed in the previous section. In both cases, subject *wh*-extraction prevents a word from occurring in C that is found there otherwise. In the case of the T-to-C asymmetry in English, the element barred from C with subject *wh*-movement is the tensed auxiliary verb, which we analyze as an instance of T that has moved to C. In the case of the *that*-trace effect, the element barred from C with subject *wh*-movement is the word *that*, which we are accustomed to thinking of as the complementizer itself, inserted as the sister of TP by the rule Merge.

Suppose, however, that this traditional view of *that* is wrong. In particular, suppose that *that* in the examples under discussion is not C at all, but an instance of T that has moved to C. If this is true, the obligatory non-occurrence of *that* in C when the local subject has been extracted can be viewed as just another instance of the T-to-C asymmetry. If this is the case, *that* in examples like (24) is in C because it has moved there — just like the auxiliary verbs that move to C in Belfast English examples like (25).

Of course, there is a difference between the two cases. In Belfast English (25), when T moves to C, T is overtly realized in C in the form of an auxiliary verb, and a gap is left in the original T-position. If *that* is also an instance of T moved to C, it represents a different realization of T-to-C movement — one in which both the new and the original positions are pronounced. In this respect, Standard English embedded T-to-C movement resembles instances of *wh*-movement that leave resumptive pronouns. For resumptive pronouns, it has been argued (Engdahl 1985; Demirdache 1991; Fox 1994) that the pronoun is linked to its *wh*-antecedent by movement, despite the fact that both positions are pronounced. We make a very similar proposal for the relation between *that* and the original position of T.³¹ We will not attempt to explain why T-to-C movement is realized as a "traditional" instance of auxiliary verb movement in some environments in some dialects, and as *that* doubling a tensed verb in others. That is an important question, of course, and our failure to offer an account constitutes a gap in our proposal. We will, however, give a more complete characterization of the facts in the following sections, which can (we hope) serve as a foundation for further investigation of the matter.

Putting these questions aside, let us see how our hypothesis accounts for the facts under discussion. Declarative C, when it hosts successive-cyclic *wh*-movement, bears both *uT* and *uWh* features. Both features have the EPP property. Suppose the nearest *wh*-phrase to C is a non-subject. In such a structure, the *uT* feature on C may be deleted by T-to-C movement, while the *uWh* feature on C is deleted by movement of the *wh*-phrase. In Standard English T in C is pronounced as *that* in this environment. C itself, we assume, is null in English. The result is (29):

- (29) **Non-subject extraction from a declarative CP**
What_i did John say [_{CP} *t*-what_i [_T that]_j + [C, #T, #Wh] [_{IP} Mary will_j buy *t*-what_i]]?

Now consider the case in which the nearest *wh*-phrase to C is the nominative subject. In this situation, movement of the nominative subject to Spec,CP can simultaneously delete both *uT* and *uWh* on C. By the Economy Condition (6), this possibility excludes the less economical derivation in which *uWh* is

deleted by *wh*-movement and *uT* by **T-to-C movement**. Since T in C is pronounced *that* in Standard English embedded declaratives, the result is the **obligatory absence of *that***.

We thus predict the *that*-trace effect, illustrated in (30), where the crossed-out material is the trace of successive-cyclic *wh*-movement:

(30) **Subject extraction from a declarative CP: the *that*-trace effect**

- a. *Who_i did John say [CP *t*-[*who*, +*wh*, #F]_i [T *that*]_j+ [C, #T, #Wh] [IP *t*-who_i will_j buy the book]]?
 b. Who_i did John say [CP *t*-[*who*, +*wh*, #F]_i [C, #T, #Wh] [IP *t*-who_i will_j buy the book]]?

If this analysis of the *that*-trace effect is correct, **there is indeed T-to-C movement in every clause in which a non-subject has undergone *wh*-movement**, as we expect if ACX is correct.³² We have not, of course, proven that ACX is correct — merely that it predicts the presence of *uT* on any C that attracts non-subject *wh*-phrases. We return to more affirmative arguments for ACX in section 5 and especially in section 11. **At this point, ACX is a heuristic** that led us to our account of the *that*-trace effect. That account is the main result of this section, **vindicating Koopman's idea that the T-to-C asymmetry and the *that*-trace effect are two aspects of the same phenomenon.**

4. Movement of the nominative subject to Spec,CP in embedded declarative clauses

Once we analyze English *that* as T moved to C in clauses that host successive-cyclic *wh*-movement, **we should view English *that* as T-in-C in all clauses**, not just those from which *wh*-movement has taken place. This means that *that* is T moved to C even in simple sentences like (31)

- (31) Mary thinks that Sue will buy the book.

If this is the case, all instances of finite C bear *uT* in English, not just cases in which C also bears *uWh*:

- (32) Mary expects [CP [T *that*]_j+ [C, #T] [IP Sue will buy the book.]]

We are now in a position to also understand the syntax of **embedded declarative clauses like (33) that are *not* introduced by *that***:

- (33) Mary thinks Sue will buy the book.

In (33), the C of the embedded declarative should be no different from the C of the embedded declarative of (31), as analyzed in (32). C in (33), like C in (32), presumably bears an instance of *uT* which must be deleted. Clearly, *uT* is not deleted here by T-to-C movement, since the embedded clause is not introduced by *that*. What does delete *uT* on C in (33)? We once again suggest that the nominative subject does this job. **The nominative subject moves to Spec,CP, attracted by *uT* on C**, satisfying the EPP property of C's *uT* feature:

- (34) Mary expects [CP [Sue, #T]_j [C, #T] [IP *t*-Sue_j will buy the book.].

Why are both (32) and (34) possible? In embedded declarative clauses, **C seems able to choose freely between TP and Spec,TP** when it looks for a way to delete its *uT* feature. This is expected, since both TP and its specifier bear a tense feature (interpretable on TP, uninterpretable on its specifier) — and both are equally close to C by the definition of "close" in (12). The freedom seen in embedded declaratives like (32) and (34) contrasts with the lack of freedom in the interrogative and declarative clauses that we have been discussing until now. In the previous sections, we examined interrogative clauses and those

embedded declaratives whose C bears a *uWh* feature. In such clauses, **when the nominative subject is a *wh*-phrase, the Economy condition in (6) forces C to pick Spec,TP** over TP itself as the element that deletes *uT* on C. Economy makes this choice because a nominative *wh*-phrase in Spec,TP can delete *uWh* on C in addition to *uT*. In declaratives like (32) and (34), from which *wh*-movement does not take place, C does not bear *uWh* in addition to *uT*. Consequently, Economy considerations here play no role in deciding whether *uT* on C will be deleted by T-to-C movement or by movement of the subject to Spec,CP. C is free to choose either method for deleting its *uT* feature.

The same freedom should be available to C even when C bears *uWh* — so long as the nominative subject is not a *wh*-phrase. Example (24) showed a non-subject *wh*-phrase extracted from an embedded declarative. This declarative clause was introduced by *that*, which meant that the *uT* feature of C was deleted by T-to-C movement, as analyzed in (29). We did not at that time address the analysis of examples that differ from (24) only in the absence of the word *that*:

(35) What did Sue say [_{CP} Mary will buy ___]?

In fact, the absence of *that* in (35) receives the same analysis as that accorded to (33) in (34). The *uT* feature on the embedded C can be deleted by T-to-C movement, as in (32), or by movement of the nominative subject to Spec,CP, as in (34). This yields the variant without *that* seen in (35). Example (35) is thus analyzed as in (36):³³

(36) What_i did Sue say [_{CP} *t*-[what, +wh]_i [_{Mary}, ~~*uT*~~]_j [_C, ~~*uT*~~, ~~*uWh*~~] [_{TP} *t*-Mary_j will buy *t*-what_i].

One interesting property of embedded **declarative clauses without *that* may provide two arguments of interest to us:** first, an argument in favor of our proposal that such clauses involve movement of the subject to Spec,CP, and second, an argument in favor of ACX. As observed by Doherty (1993; see also Grimshaw 1997), the **presence of *that* is nearly obligatory in embedded declarative clauses in which an adverbial or topicalized phrase has been fronted:**

(37) a. Mary is claiming that [for all intents and purposes] John is the mayor of the city.
b. ??Mary is claiming [for all intents and purposes] John is the mayor of the city.

(38) a. Mary knows that [books like this] Sue will enjoy reading.
b. ??Mary knows [books like this] Sue will enjoy reading.

We cannot provide a detailed account of adverb fronting or topicalization. Let us suppose, however, that the fronted adverbial in (37) and the **topicalized phrase seen in (38) are dominated by TP** — perhaps as specifiers external to the nominative subject.³⁴ The presence of these phrases has an effect on what may delete *uT* on C, if ACX is correct. **The nominative subject and TP are no longer equally close to C** under the definition of "closeness" in (12), because of the presence of the outer specifier that c-commands the subject:³⁵

(39) [_C, *uT*] [_{TP} topic [_{T'} subject [_{T'} T ...]]]

Only TP counts as maximally close to C. Consequently, given ACX, **C must choose TP rather than the nominative subject to delete its *uT* feature.** This **yields the obligatory *that*** (the realization of T-to-C movement) observed in these examples. (Remember that attraction of TP by *uT* on C is realized as T-to-C head movement, due to the Head Movement Generalization in (13).)

A further consequence is also expected. Consider a configuration like (39) in which C bears *uWh* in addition to *uT*, and in which the subject is a *wh*-phrase — e.g. (40):

- (40) [C, *uT*, *uWh*] [_{TP} topic [_T *who* [_T T ...]]]

Here too the nominative subject is farther from C than TP. If (40) is an embedded declarative clause from which nominative *who* is being extracted, we expect an "anti-*that*-trace" effect.³⁶ Despite the fact that the nominative subject is being extracted, *that* should be possible (in fact, obligatory). As observed by Bresnan (1977, 194 fn. 6; see also Culicover (1993) and Browning (1996)), *that* is indeed possible in configurations like (40).³⁷

- (41) **Anti-*that*-trace effect**³⁸
 a. Sue met the man who Mary is claiming that [for all intents and purposes] __ was the mayor of the city.
 b. Bill, who Sue said that [to the rest of us] __ might seem a bit strange, turned out to be quite ordinary.

5. T-to-C movement vs. subject movement in matrix questions

If non-*wh* nominative subjects can move to Spec,CP and delete *uT* on declarative C, we must ask how general this possibility is. When we discussed the T-to-C asymmetry in matrix *wh*-questions, we talked as if the presence of *uT* on C forced T-to-C movement in all cases except those in which the subject of the clause is a nominative *wh*-phrase. In fact, however, we must ask whether movement of a nominative subject to Spec,CP could delete *uT* even when the *wh*-phrase of the clause is not the nominative subject. One important case is the contrast between (5a) and the unacceptable (5b), repeated below as (42a-b):

- (42) **T-to-C movement obligatory in matrix *wh*-questions**
 a. What **did** Mary buy?
 b. *What Mary bought?

The obligatoriness of T-to-C movement here might lead us to search for a factor that favors T-to-C over subject movement in matrix clauses where C bears *uT* and *uWh*. We suspect that this is not the right approach. If we replace the interrogative *wh*-phrase in (42) with one that supports an **exclamative** interpretation (Elliott 1971; Grimshaw 1979) **the judgments reverse**. Compare (42) with (43):

- (43) **T-to-C movement impossible in matrix *wh*-exclamatives**
 a. *What a silly book **did** Mary buy!
 b. What a silly book Mary bought!

This suggests to us that matrix *wh*-clauses in general do indeed have two options for deleting *uT* on C when the *wh*-phrase is not the nominative subject. In addition to T-to-C movement, the option of nominative subject movement to Spec,CP is also available:

- (44) [_{CP} [What a silly book]_i [_{Mary}, #_F]_j [C, #_F, #_{Wh}] [_{TP} *t-Mary*_j T bought *t-what a silly book*_i]]?

What is interesting is the fact that the choice among these options has a consequence for interpretation. The facts seem to be as described in (45):

(45) **Exclamative vs. interrogative interpretation**

A matrix CP whose head bears *uWh* is interpreted as an exclamative if a non-*wh*-phrase appears as one of its specifiers. Otherwise, it is interpreted as a question.³⁹

Semantic conditions on the nature of the *wh*-phrase further filter the class of available structures, so that *who* and *what* support only interrogatives, while phrases like *what a silly book* support only exclamatives.

If (45) is the correct description of the facts, it should be impossible to form a *wh*-exclamative whose moved *wh*-phrase is the nominative subject. When the nearest bearer of *uT* and *uWh* is the same phrase, no non-*wh*-phrase will move to Spec,CP. Speakers judgments confirm the prediction. The type of *wh*-phrase seen in (46) supports only an exclamative interpretation — but that interpretation is unavailable, since no non-*wh*-phrase has moved to Spec,CP:⁴⁰

(46) *What a silly person just called me on the phone!

We will not investigate (45) in any depth, but leave it as an observation to be explored in further research. For our purposes, it is sufficient to note what matrix *wh*-exclamatives show: that movement of the nominative subject to C is available as an alternative to T-to-C movement — even in matrix clauses headed by a C that contains *uWh*.

6. EPP and embedded questions

A similar issue arises with embedded questions in Standard English. Here too we do not find overt T-to-C movement, either in the form of *that* or in the form of a fronted auxiliary verb:

(47) **Standard English: no embedded T-to-C movement**

- a. Bill asked what Mary bought.
- b. *Bill asked what did Mary buy.
- c. *Bill asked what that Mary bought.

The fact displayed in (47c) is one of the standard cases of the "Doubly Filled Comp Filter", which bars the co-occurrence of *that* and a *wh*-phrase in Spec,CP. The traditional implementations of this filter posit an analysis for (47a) in which *that* appears in C in the syntax, but is unpronounced due to a phonological deletion rule (Chomsky and Lasnik 1977; Pesetsky 1998). The view of movement that we are adopting, along with the proposals made here, suggests a different approach. Here there is no contrast between embedded interrogatives and exclamatives — so we would not wish to analyze the contrast between (47a) and (47b-c) as related to interpretation. There is, however, a contrast among dialects of English.

In particular, sentences like (47b-c) are acceptable in Belfast English, as discussed by Henry (1995). The co-occurrence of *that* with the *wh*-phrase seen in (49) is limited to embedded questions in Belfast English, much as *that* in declarative sentences is limited to embedded contexts in Standard English:⁴¹

(48) **Belfast English embedded T-to-C movement (auxiliary verbs)**

- a. She asked who had I seen.
- b. They wondered what had John done.
- c. They couldn't understand how had she had time to get her hair done.
- d. I wondered where were they going.

(Henry 1995, 106; 116)

(49) **Belfast English embedded T-to-C movement (*that*)**

- a. I wonder which dish *that* they picked.
- b. They didn't know which model *that* we had discussed.

(Henry 1995, 107)

Belfast English thus displays embedded questions whose syntax resembles the syntax of other (Standard English) clause-types considered so far. Thus, the examples in (48) and (49) show *uT* on the embedded C deleted by T-to-C movement. Examples like (47a), when used in Belfast English, may display the subject movement option.

Evidence that Belfast English *that* is an instance of T moved to C (just like Standard English *that*) comes from the fact that, just like *do* in Standard (and Belfast) English, *that* in constructions like (49a-b) is impossible in embedded interrogative clauses whose nominative subject is the *wh*-word of the clause. We can view this phenomenon as the T-to-C asymmetry with *that* rather than the auxiliary, or as a short-distance case of the *that*-trace effect. Either way, the phenomenon reinforces our claim (inherited from Koopman 1983) that the phenomena are fundamentally identical:⁴²

(50) **Belfast English: T-to-C asymmetry recapitulated with *that***

- a. *I wonder who did go to school? (Alison Henry, p.c, bad unless *do* is emphatic)
- b. *I wonder which author *that* wrote this book. (Henry 1995, 141 fn 2)

As expected, given (50), Belfast English also displays a *that*-trace effect in embedded declarative clauses identical to that found in Standard English. Since embedded T-to-C movement in Belfast English takes the form of a moved auxiliary in addition to the form of *that*, we find the effect both with *that* and with fronted auxiliaries:

(51) **Belfast English: *that*-trace effect**

- a. *Who did John say [did __ go to school]?(Alison Henry, p.c, bad unless *do* is emphatic)
- b. *Who do you think [that __ left]. (Henry 1995, 128)

We can thus be reasonably certain that Belfast English differs from Standard English in using T-to-C movement to delete *uT* on C in embedded *wh*-questions.

What lies behind this difference between Belfast English and Standard English? We suggest that the dialects differ on one simple point: whether or not *movement* is the strategy adopted to delete *uT* on C. As we noted earlier, deletion of uninterpretable features is not always accomplished by movement, but is sometimes accomplished by the simpler operation of Agree — one of the components of movement. In these cases, a connection is established between the uninterpretable feature and another occurrence of that feature. This connection suffices to delete the uninterpretable feature, but does not motivate movement. In these cases, we say that the uninterpretable feature lacks the "EPP property". Languages and dialects differ precisely on the question of which uninterpretable features have the EPP property.

We suggest that Standard English embedded interrogative C lacks the EPP property for *uT*, while Belfast English C in the same context has the EPP property.⁴³ That is why no form of T-to-C movement (either involving *that* or a fronted auxiliary verb) is observed in Standard English embedded interrogatives. In attributing the contrast between Belfast English and Standard English to a difference in the EPP feature of embedded interrogative C, we are suggesting that this difference is fairly trivial. It may, of course, turn out that there are deeper factors involved, but at present all we can say is that the dialects differ, and that it is possible to localize the difference in the grammar.

7. Summary

In this section, we summarize our account of the T-to-C asymmetry, the *that*-trace effect and related phenomena. There are four types of clauses considered so far:

(52) Clause types

Matrix *wh*-clause⁴⁴

<i>Features of C:</i>	<i>uT</i> (+EPP), <i>uWh</i> (+EPP)
<i>Deletion of uT:</i>	by T-to-C movement or subject movement
<i>Deletion of uWh:</i>	by <i>wh</i> -movement
<i>Note 1:</i>	By the Economy Condition (6)), if the nominative subject is <i>wh</i> , no T-to-C movement occurs (the "T-to-C asymmetry").
<i>Note 2:</i>	If subject movement deletes <i>uT</i> , exclamative interpretation results. Otherwise, interrogative interpretation.

Embedded *wh*-clause

	[Standard English]	[Belfast English]
<i>Features of C:</i>	<i>uT</i> (-EPP), <i>uWh</i> (+EPP)	<i>uT</i> (+EPP), <i>uWh</i> (+EPP)
<i>Deletion of uT:</i>	by Agree (no movement)	by T-to-C movement or subject movement
<i>Deletion of uWh:</i>	by <i>wh</i> -movement	by <i>wh</i> -movement

Embedded declarative with no *wh*-extraction

<i>Features of C:</i>	<i>uT</i> (+EPP)
<i>Deletion of uT:</i>	by T-to-C movement or subject movement (looks like <i>that</i> -deletion)

Embedded declarative with *wh*-extraction

<i>Features of C:</i>	<i>uT</i> (+EPP), <i>uWh</i> (+EPP)
<i>Deletion of uT:</i>	by T-to-C movement or subject movement (looks like <i>that</i> -deletion)
<i>Deletion of uWh:</i>	by <i>wh</i> -movement
<i>Note:</i>	By the Economy Condition (6), if the nominative subject is <i>wh</i> , no T-to-C movement occurs (the <i>that</i> -trace effect).

In addition, though we do not offer an explanation for the different forms that T-to-C movement takes in Standard and Belfast English, we can describe the facts as follows:

(53) Realization of T-to-C movement

Standard English:

T-to-C movement is realized as auxiliary verb movement in main clauses where C has *uWh*. Otherwise, T-to-C movement is realized as *that* doubling T.

Belfast English:

T-to-C movement is always realized as auxiliary verb movement in main clauses and is optionally realized as auxiliary verb movement in embedded clauses, where C has *uWh*. Otherwise, T-to-C movement is realized as *that* doubling T.

We should also note at this point a cautionary lesson from our findings. English C, if we are correct, is phonologically null. Morphemes pronounced in C are pronounced there as a consequence of movement. We do not expect to find this pattern of data in every language. As far as we know, C does not have to be a zero morpheme. Consequently, it becomes necessary to establish whether the "clause introducer" of a given language is C or an element moved to C. In Spanish, for example, if examples like (26a-c) studied by Torrego (1983; 1984) show T-to-C movement, the presence of *que* to the left of the fronted tensed verb suggests that *que* is an instance of C — not an element moved to C.⁴⁵ In Yiddish, on the other hand, the morpheme *az* that introduces finite clauses is probably an instance of T moved to C, like English *that*. As noted by Diesing (1990), Yiddish does show an *az*-trace effect:

(54) **Yiddish *az*-trace effect**

Ver hot er moyre (**az*) vet kumen?
 who has he fear (*that) will come
 'Who is he afraid will come?' (Diesing 1990, 75)

Yiddish also shows T-to-C movement of the more traditional sort accompanying successive-cyclic *wh*-movement just as in Spanish. Unlike Spanish *que*, however, *az* does not co-occur with the fronted verb — a further argument that *az*, unlike *que*, is not C, but a realization of T moved to C. *Az* does not co-occur with the fronted verb because *az*-fronting and verb-fronting are two different realizations of the same operation: T-movement to C:⁴⁶

(55) **Yiddish T-to-C accompanying successive-cyclic *wh*-movement**

- a. Vos hot er nit gevolt az mir zoln leyenen?
 what has he not wanted that we should read
- b. Vos hot er nit gevolt zoln mir leyenen?
 what has he not wanted should we read
- c. *Vos hot er nit gevolt az zoln mir leyenen?
 what has he not wanted that should we read (Diesing 1990, 71-72)

8. The *that*-omission asymmetry

Let us now turn our attention to a difference between embedded declarative clauses with and without *that*. We analyzed this alternation in (32) and (34) as the consequence of *u*T on C attracting TP or attracting its specifier. We repeat the embedded clauses of (32) and (34) as (56a-b) below:

- (56) a. ... [CP [T that]_j+[C, #F] [IP Sue will_j buy the book.]] "...that Sue will buy the book..."
 b. ... [CP [Sue, #F]_j [C, #F] [IP *t*-Sue_j will buy the book.]] "...Sue will buy the book..."

In (56b), the nominative subject has been attracted to Spec,CP by the *u*T feature of C. This means, as we noted earlier, that *u*T on the subject did not disappear while still in Spec,TP — despite the fact that T entered an Agree relation with *u*T on the subject that marked *u*T on the subject for deletion.

Nevertheless, uninterpretable features that have been marked for deletion (like *u*T on *Sue*) must finally disappear once the embedded CP has been built. Otherwise, we might expect the nominative subject to be attracted out of Spec,CP by a higher functional head. For example, if the embedded clause in (56b) is the object of a passive verb, we might expect *Sue* to be attracted into the higher subject position by the matrix T:⁴⁷

- (57) *Sue was expected [__ will buy the book].

We can exclude (57) if uT on *Sue* is erased once and for all after the embedded CP is fully built, and if the presence of uT on DP is crucial to the attraction of DP by matrix T. We propose that this is the case. The assumption that uninterpretable features marked for deletion disappear completely at the end of the CP cycle is the proposal also argued for by Chomsky (1998, 1999) in his discussion of the notion *phase*.⁴⁸ The observation that erasure of uT on *Sue* at the conclusion of the CP cycle prevents attraction by the higher T arises, we suggest, from a different fact about the grammar: a requirement that *all* the features of an attractor be present (in interpretable or uninterpretable form) on the elements that it attracts.⁴⁹

(58) **Match Condition**

If a head H enters an Agree relation with a set of phrases K, each syntactic feature of H must be present on some member of K⁵⁰ (not necessarily with the same value, including value for EPP).

The Match Condition is asymmetric, in that it allows the attracted element to bear features not present on the attractor — as is the case, for example, when T happens to attract a nominative *wh*-phrase. In such an instance, the attracted element bears uT and $-$ -features also present on T, but bears a *wh*-feature not present on T. In (57), by contrast, since *Sue*'s uT feature has completely disappeared once the embedded CP is built, it cannot be attracted by the matrix T, even though it bears $-$ -features capable of deleting the uninterpretable $-$ -features of the upstairs T. By the Match Condition, the higher T cannot attract *Sue*.

Now consider in this light the embedded CPs in (56a-b). In (56a), head-to-head movement has taken place, with the result that C includes an instance of T in it. Since T here is the actual Tense of the sentence, its tense property is, of course, interpretable and does not delete. The presence of interpretable T in C in examples like (56a) has important syntactic consequences. To illustrate this, consider the contrast between (56a) and (56b). Here, instead of T-to-C movement, the nominative subject has moved to Spec,CP. Like T, the nominative subject is able to delete uT on C. Unlike the tense properties of T itself, the T-feature of the nominative subject is uninterpretable. As a consequence, there is no instance of interpretable T in the C-system of (56b).

Suppose one of the CPs seen in (56) is merged into a higher clause that contains finite T. As we saw in (9), finite T in English bears u with an EPP property, and therefore should attract the closest bearer of $-$ -features into its specifier, in accordance with the ACF condition in (10). Suppose the closest bearer of $-$ -features is the merged CP⁵¹ — either because CP is a direct object of a passive or unaccusative verb, or because CP has been merged into an external argument position below T. By the Match Condition in (58), this CP must bear T features of some sort in addition to its $-$ -features, or else the higher T cannot attract it into its specifier and delete the u features of T. In other words, this CP must be of the type seen in (56a), where CP is headed by a C that has incorporated T (realized as *that*) — but cannot be of the type seen in (56b), where the uT feature on C has been deleted by the nominative subject and has been erased at the end of the CP cycle. In fact, this is the case. We have just provided an account of the *that*-omission asymmetry presented in the introduction to this paper. As we noted there, a finite CP functioning as the subject of a higher clause must be introduced by *that*:⁵²

- (59) a. [That Sue will buy the book] was expected by everyone.
b. *[Sue will buy the book] was expected by everyone.
- (60) a. [That Sue will buy the book] proves that she's rich.
b. *[Sue will buy the book] proves that she's rich.

Let us see how our explanation of these contrasts works. At the point at which the higher T has been merged, the structures of (59a-b) look like those in (61a-b), respectively:

(61) **(59a-b) midway in the derivation**

- a. $[T, u \text{ (+EPP)}]$ was expected $[_{CP} [_T \text{ that}]_j [_C, \#T, \text{ }] [_{IP} \text{ Sue will}_j \text{ buy the book.}]] \dots$
- b. $[T, u \text{ (+EPP)}]$ was expected $[_{CP} [_{\text{Sue}, \#T}]_j [_C, \#T, \text{ }] [_{IP} \text{ } t\text{-Sue}_j \text{ will buy the book.}]] \dots$

The higher T must attract an element that has u and T-features of its own (interpretable or uninterpretable), and merge this element as a specifier. In (61a), because T-to-C movement has taken place in the embedded clause, the head of CP (hence CP itself) bears the necessary features to be attracted by the higher T and become its specifier. The result is (59a). In (61b), where uT on the lower C has been marked for deletion by the nominative subject *Sue*, no instance of uT remains on C once the CP cycle is completed. Since the nearest bearer of $-$ features is the CP, ACF will not allow C to attract any lower phrase. Since the embedded CP lacks a tense feature at this point in the derivation, the Match Condition prevents T from attracting this CP.⁵³ Since the Match Condition prevents C from attracting the only phrase that ACF allows it to attract, C is unable to delete its u features in a way that satisfies the EPP property of this feature.⁵⁴

Our discussion has been fairly technical, but it actually amounts to a simple, traditional idea, which is worth noting at this point. The key to our hypothesis about the *that*-omission effect is the idea that a clause may become a specifier of finite T only if its head bears a Tense feature. We identified the uninterpretable variant of the Tense feature with the more familiar notion "nominative case", but we could as well have generalized this proposal to phrases bearing any sort of Tense feature — interpretable or uninterpretable. If we think of the predicate "bearing nominative case" as equivalent to the predicate "bearing a T-feature", then our proposal concerning the *That*-omission Asymmetry amounts to the simple statement that the subject of T is nominative. The novelty of our proposal lies mainly in the claim that declarative clauses introduced with *that* are nominative, while declarative clauses without *that* are not.⁵⁵

9. Subject questions and the lifespan of deleted features

Embedded *wh*-questions in Standard English raise a problem for our proposal, since they can function as subjects of finite T:⁵⁶

- (62) [Which book Mary read yesterday] is not known.

This problem arises if, as we have suggested, the uT feature of interrogative C lacks the EPP property in Standard English embedded questions. If uT of the embedded C in (62) lacks the EPP property, then T has not moved to C. Instead, the uT feature of C has entered an Agree relation with the embedded TP (or with the nominative subject). Since C in (62) does not actually contain T, the subject clause in (62) should have the same status as the subject declarative clauses without *that* that we examined in the previous section — that is, it should be unacceptable. Obviously, this prediction is false.

One might attempt to avoid this problem by proposing that — instead of Agree — some type of "feature movement" from T to C (like that proposed by Chomsky 1995) may take place when uT on C lacks the EPP property. On this view, C in (62) could acquire an interpretable T-feature by feature movement. This alternative will fail, however, for embedded *wh*-questions whose *wh*-phrase is the nominative subject:

- (63) [Which person read the book] is not known.

In (63), if our previous discussion is correct, the *uT* feature of C has made no contact whatsoever with TP. Instead, C has attracted the nominative *wh*-phrase (for reasons already discussed). Thus, even if the proper analysis of (62) should turn out to involve feature movement rather than Agree, (63) would remain a problem.

Although we do not have a conclusive solution to this problem, we can offer a reasonable (but non-inevitable) proposal that works well with the discussion so far and has consequences for other phenomena discussed below. Further work will be necessary to establish whether our proposal has independent support outside the domain of facts investigated here.

The problem in (62) and (63) arises only if *uT* on interrogative C (in embedded questions) must disappear at the end of the CP cycle (once marked for deletion), as is the case in embedded declaratives. If *uT* on C of an embedded question could stay "alive" after the CP cycle, despite being marked for deletion, then the matrix T would be able to attract the embedded question without violating the Match Condition. The embedded question would still bear an instance of *uT* in addition to its *-features*, even though *uT* would have been marked for deletion on the lower CP cycle. Thus, it is possible that embedded questions in Standard English differ from embedded declaratives in not requiring the disappearance of features at the end of the CP cycle that have been marked for deletion.

This difference between embedded declarative and interrogative clauses might then be related to the EPP difference between *uT* on C in an embedded declarative and *uT* on C in an embedded question. In Standard English, as we have seen, *uT* on C in the embedded declarative has the EPP property, but *uT* on C in the embedded question does not. More generally (and speculatively), we propose (64)

(64) **Feature Lifespan**

A feature marked for deletion as a consequence of an operation (Agree, Move) must disappear at the end of the CP cycle if it has the EPP property. Otherwise it may delete at the end of the derivation.⁵⁷

As a consequence of (64), *uT* on the embedded declarative C in (61b) must disappear before the embedded clause is merged with the higher verb, but *uT* on C of the embedded question in (63) remains, and is therefore eligible for attraction when the higher T is merged. This difference is illustrated in (65) and (66) below:

(65) **Disappearance of features in subject declarative clauses without *that***

The embedded clause of (61b) --

a. [_{CP} [Sue, *#F*]_j [C, *#F*,] [_{IP} *t-Sue*_j will buy the book.]]...

-- looks like this when merged with the higher verb because *uT* on C has the EPP property:

b. expected [_{CP} [Sue]_j [C,] [_{IP} *t-Sue*_j will buy the book.]]...

When T merges, it cannot attract the lower CP:

c. [T, *u* (+EPP)] was expected [_{CP} [Sue]_j [C,] [_{IP} *t-Sue*_j will buy the book.]]...

- (66) **Non-disappearance of features in subject declarative clauses without that**
The embedded clause of (63) --
a. $[_{CP} [\text{which person}, \#F, \text{ , wh}]_j [_{C}, \#F, \text{ , wh}] [_{IP} t\text{-which person}_j \text{ will buy the book.}]...$
-- looks the same when merged with the higher verb because uT on C lacks the EPP property:
b. known $[_{CP} [\text{which person}, \#F, \text{ , wh}]_j [_{C}, \#F, \text{ , wh}] [_{IP} t\text{-which person}_j \text{ will buy the book.}]...$
When T merges, it does attract the lower CP:
c. $[_T \text{ is , } u \text{ (+EPP)}]$ not known
 $[_{CP} [\text{which person}, \#F, \text{ , wh}]_j [_{C}, \#F, \text{ , wh}] [_{IP} t\text{-which person}_j \text{ will buy the book.}]...$

The correlation suggested in (64) may also provide a reason for the existence of pied-piping (as originally described by Ross 1967) in *wh*-movement and similar constructions. Consider a situation in which a *wh*-phrase proceeds successive-cyclically through the specifiers of a number of categories whose heads bear uWh , on the way to its final landing site in the specifier of an interrogative C . On this scenario, the interrogative C bears a uWh feature with the EPP property, or else *wh*-movement would not be overt. Suppose, however, that one of the embedded heads bearing uWh — for example, P — bears a version of the uWh feature that lacks the EPP property. The situation that we have in mind is the one schematized in (67), where *who* bears the *wh*-feature and is the object of a P with a uWh feature lacking the EPP property. *Wh*-movement has not yet taken place:

- (67) $[_{CP} [_{C}, uWh (+EPP), ...] ... [_{PP} [P, uWh (-EPP)] \text{ who }] ...]$

A relation is established between the uWh feature of P and the *wh*-feature of *who*. Since the uWh feature of P lacks the EPP property, this relation has to be Agree, not Move. If (64) is correct, this means that uWh on P will not disappear just because a CP cycle might come to an end in the course of the derivation. Consequently, we expect PP in (67) to be able to undergo *wh*-movement — the phenomenon known as *pied-piping*. Notice that PP can be attracted by a higher uWh whether it is in its original position (e.g. as a complement to a verb) or in specifier of some intermediate CP (as a step in successive-cyclic movement).

The standard description of pied-piping in *wh*-constructions relies on a mechanism of "percolation" that copies the *wh*-feature of a *wh*-word (in uninterpretable form, presumably) onto a constituent that dominates it. The *wh*-word remains in situ within the larger constituent and the larger constituent undergoes *wh*-movement. Our account reverses this logic. The uWh feature is present on the larger constituent from the start (because otherwise an island condition would be violated by movement out of the larger constituent). The connection between the *wh*-word and uWh on P does not result from a special percolation mechanism, but from the normal rule of Agree. The reason a pied-piped *wh*-phrase can exit CP is (64). Although it is premature to regard this account as established, we suspect that the phenomenon of pied-piping will turn out to provide further support for (64).

10. The Irrelevance of Emptiness

We have now offered a unified explanation of the three subject/non-subject asymmetries that we introduced in section 1. As we pointed out, the prospect of a unified explanation of these phenomena was anticipated by researchers of the 1980s, who attributed the phenomena to an Empty Category Principle. We have argued that these effects do have a common origin, but have offered an entirely different account. It is worth comparing the central points of our account with the ECP proposals of the 1980s, in part because the comparison highlights some important differences between our overall approach to movement and structure building and the "Government-Binding" approaches of the 1980s.

First let us consider our account of the T-to-C asymmetry and of the *that*-trace effect. The accounts of the 1980s took both effects to be consequences of a representational condition on traces of movement. Traces showed the effects of this condition because they were "empty categories" — unpronounced phrases in need of special licensing because of their absence from the phonetic signal. Many versions of this condition were offered. Example (68) gives Chomsky's (1981) proposal:

(68) **Empty Category Principle (Chomsky 1981)**

- a. ECP: [*e*] must be properly governed,
- b. *Proper Government*: properly governs *α* if and only if *β* governs [and AGR]
- c. *Government*: Consider the structure [... ...], where
 - (i) *α* = X° [*head government*] or is coindexed with [*antecedent government*],
 - (ii) where *β* is a maximal projection, if *β* dominates *α*, then *β* dominates *α*, and
 - (iii) *α* c-commands *β*.

In this case, *β* governs *α*.

A trace of *wh*-movement in the specifier of AGR (i.e. T) could satisfy the ECP only by antecedent government, while a trace in object position required government by V. The *that*-trace effect arose because the presence of *that* somehow blocked antecedent government. In Koopman's (1983) account of the T-to-C asymmetry, a fronted auxiliary verb was taken to have the same blocking property. These accounts had a strongly "representational" character. At the point at which the ECP matters, *wh*-movement has taken place, *that* is present in C, any auxiliary verbs have raised, and the question is: is the structure legitimate? A proposal of this sort was quite natural in the "Government-Binding" framework of the times, in which movement was taken to be a free option, restricted mainly by conditions on its output. Yet, as we can easily see with the wisdom of hindsight, the specific proposal has the hallmarks of a non-starter. It stipulates too much that is particular to the constructions being explained: for example, that antecedent-government and head-government have the same licensing effect, that AGR does not count as a governor, and that elements like *that* that should not block government, given (68), nonetheless do.

Our explanation of the *that*-trace effect and T-to-C asymmetry depends crucially on the new view of movement developed in the late 1980s and 1990s.⁵⁸ Our account relies on the idea that movement is not a free option, but occurs only to resolve the very particular problems of heads that bear uninterpretable features (with an EPP property). It is only in this context that our identification of *that* as T moved to C is significant, since it allows us to view the *that*-trace effect as the result of competition between T and its specifier to solve the "Tense problems" of C. Only a theory in which movement is a last-resort problem-solving strategy gives meaning to competition of this sort. If our proposals are correct, traces need no special licensing. Likewise, the fact that traces are "empty categories" plays no particular role in our account.⁵⁹

These differences between ECP proposals and our own have particularly important empirical consequences for the *that*-omission asymmetry. The ECP account of this asymmetry relied on the idea that an unpronounced head of a category XP counts as properly governed if XP itself is properly governed (Belletti and Rizzi 1981; Stowell 1981). An unpronounced C that is not antecedent-governed could satisfy the ECP only if its maximal projection were governed by a head other than AGR. The word *that* was, of course, taken to be a pronounced instance of C. Finite embedded clauses without *that* were taken to have an unpronounced version of *that*, i.e. an "empty" C. The *that*-omission asymmetry introduced in (4) followed from the ECP under an analysis like that sketched in (69), where the fact that C is null in (69d) is crucial:

(69) **That-omission asymmetry as analyzed by Stowell (1981)**

- a. Mary thinks [[_C that] Sue will buy the book].
- b. Mary thinks [[_C \emptyset] Sue will buy the book].
- c. [[_C That] Sue will buy the book] was expected by everyone.
- d. *[[_C \emptyset] Sue will buy the book] was expected by everyone.

Once again, the ECP account was crucially representational. English finite C was taken to come in two varieties: pronounced and "empty". In a structure with a subject CP whose head is unpronounced, the ECP was taken to filter out the unpronounced variant when it was not properly governed.

We, by contrast, have no filter that excludes heads of subject sentences if they fail to meet some criterion. Instead, the laws of movement determine whether a CP whose head has a particular featural composition can become a subject in the first place. This account once again relies on the idea that movement occurs only when it can solve a problem. It also relies on a finding more recent than the early ECP literature: the discovery that when an argument occupies the specifier of TP, it moves there from a lower position (Hale (class lectures, 1980); Kitagawa 1986; Kuroda 1988; Koopman and Sportiche 1991). This finding is significant, since the effect seen in (69) is found with subjects of active transitive verbs as well as with subjects that were taken to be derived by movement even in 1981. What is important in our account is whether T of the higher clause has any features not borne by C of the embedded clause — that is, whether the Match Condition (i.e. the requirement that the element attracted by T also bear some type of T feature) may be satisfied by movement of the embedded CP to the specifier of the higher TP. This, in turn, depends on the movement patterns within the lower clause — in particular, whether T moved to C. Interestingly, "emptiness" is irrelevant. In English embedded finite declarative clauses, it so happens that the CP with the more restricted distribution contains an unpronounced C and the freer CP contains phonological material in C — but that is simply because the English declarative complementizer is null, while T (in the form of *that*) is not. If our account is correct, "emptiness" as a factor in the *that*-omission asymmetry was a red herring.

The case of embedded questions in subject position examined in the previous section already demonstrated this quite nicely.⁶⁰ They are acceptable despite the absence of pronounced material in C. We attributed this state of affairs to the fact that C is null in English, and to the conjecture that uninterpretable features marked for deletion do not disappear at the end of the CP cycle if they lack the EPP property. More generally, we expect no general correlation between emptiness of C and acceptability of CP as a subject in a higher clause. We would thus not be surprised to find a wide range of phenomena like (69) — including contrasts in which only the *unacceptable* member of the pair has pronounced material in C and cases in which both members of the contrasting pair have pronounced material in C. Cases like these may in fact exist.

Nakajima (1996) discovered a case of the first kind: a contrasting pair that exhibits an effect akin to the *that*-omission asymmetry — except that the acceptable member of the pair has unpronounced C while the unacceptable member of the pair has pronounced C. His examples involve the two ways of introducing embedded yes/no questions in Standard English: with *whether* and with *if*. We will assume that *whether* is a *wh*-phrase in Spec,CP (with C null as always in embedded questions), while *if*, by contrast, occupies C. This assumption is supported by the fact that *whether*, unlike *if*, shows the morphology and behavior of a *wh*-phrase (as observed by Emonds (1985, 286-7); Larson (1985) and Kayne 1991). For example, *whether* may form part of the larger phrase *whether or not*, but nothing comparable is available for *if*. While it is possible that *if*, like *that* has raised to C from a lower position, we will assume that it is a complementizer:

- (70) a. Mary asked me [whether \emptyset_C Bill was happy]
 b. Mary asked me [if_C Bill was happy].

Nakajima observed that *if* questions may not function as subjects, while *whether* questions may. This fact strongly resembles a mirror image of the *that*-omission asymmetry:

- (71) **Nakajima's *whether/if* asymmetry**
 a. [Whether Bill was happy] was the main topic of discussion at our dinner.
 b. *[If Bill was happy] was the main topic of discussion at our dinner.
- (72) a. [Whether the election was fair] will be determined by the commission.
 b. *[If the election was fair] will be determined by the commission.

The existence of contrasts like these are not surprising if attraction by finite T obeys the Match Condition. If the complementizer *if* lacks either *uT* or *-*features, the CP headed by *if* will not be attracted by T, and will not surface in subject position. The complementizer found when *whether* occupies Spec,CP is presumably the normal null complementizer found in embedded questions. It bears both *uT* and *-*features, just as in the example already examined.⁶¹ Needless to say, if the ECP predicts any contrast between the (a) and (b) examples of (71) and (72), it predicts a contrast opposite to the one we find.

Polish may display a case of the second kind (as was brought to our attention by Barbara Citko, p.c.): a contrasting pair of subject CPs in which both members of the pair contain pronounced C. Polish embedded clauses may be introduced by *~e* on its own, or by the sequence *to ~e*, where *to* is found elsewhere in Polish functioning as a demonstrative pronoun (and also as a copula). Only the *to ~e* variant can introduce a subject clause:

- (73) **Polish *to*-omission asymmetry**
 a. [To *~e* tu jeste^{my}] jest wszystkim wiadome.
 to C here we are is to-everyone known
 b. *[*~e* tu jeste^{my}] jest wszystkim wiadome.

We have not investigated these structures carefully enough to determine exactly what feature *to* adds to *~e* that allows CP to function as a specifier of the higher TP. Perhaps Polish is like English, except that it has an overt complementizer *~e*, and *to* is a realization of (interpretable) T moved to C, like English *that*. Or perhaps *to ~e* is a form of *~e* that contains T-features or *-*features otherwise missing from *~e*.⁶² For present purposes, what matters is the apparent existence of a contrast similar to the *that*-omission asymmetry that does not involve an empty C. We conclude that "emptiness" was indeed a red herring in the ECP discussion of the 1980s.

11. Infinitival clauses: Evidence for ACX

The distribution and interpretation of Standard English infinitival clauses provides another argument that the "emptiness" of C does not determine the distribution of CP. Like Standard English embedded questions, infinitival clauses present a case in which C may be phonologically null, and yet head a CP that occupies the subject position of a higher clause. We will, in fact, argue that such infinitival clauses share a significant property — *uT* on C without EPP — with embedded questions. Infinitival clauses are interesting to us for another reason, however. They offer a new argument that ACX plays a role in the internal syntax of CP. We return to this point once we have sketched our basic analysis of infinitival CPs.

We begin with infinitival CPs whose subject is overt (not PRO). Such CPs, as noted by Bresnan (1972; see also Carstairs 1973, Stowell 1982, Pesetsky 1991), have a particular interpretation. They are either understood as containing an irrealis modal or else they receive a generic interpretation:

(74) Irrealis/generic infinitival clauses

- a. I would like (very much) for Sue to buy this book. [irrealis]
- b. I always prefer for my students to buy this book. [generic]
- c. *I liked (very much) for Sue to buy this book yesterday. [non-irrealis, non-generic]
'I liked it that Sue bought this book yesterday.'
- d. *I preferred for Sue to buy this book yesterday. [non-irrealis, non-generic]

The distribution of CPs introduced by *for* parallels quite closely the distribution of CPs headed by *that*.⁶³ *For* is optionally omitted in object infinitives, just like *that*:

(75) Omission of *for*

- a. I would like [Sue to buy this book].
- b. I would prefer [my students to buy this book].

When the subject of an infinitival clause is extracted by *wh*-movement, *for* may not appear in Standard English, just as *that* may not appear in comparable finite clauses. In other words, there is a *for*-trace effect exactly parallel to the *that*-trace effect (as observed by Bresnan 1977):⁶⁴

(76) The *for*-trace effect

- a. Who would you like [__ to buy the book]?
- b. *Who would you like [for __ to buy the book]?

For is obligatory when infinitival clauses like those in (74)-(75) are used as subjects of a higher clause:

(77) The *for*-omission asymmetry

- a. I would prefer [for Sue to buy the book].
- b. I would prefer [Sue to buy the book].
- c. [For Sue to buy the book] would be preferable.
- d. *[Sue to buy the book] would be preferable.

The similarities between the distribution of *for* and the distribution of *that* suggest an analysis of *for* modeled closely on our analysis of *that*. We therefore suggest that *for* in Standard English is a form of T that doubles infinitival *to* — just as *that* is a form of T that doubles the tense of the finite verb. We take C in the infinitival clauses of (73)-(77) to be identical with the C that introduces finite clauses. It bears *uT*

and . Its uT feature can be deleted by movement of T-to-C (realized as *for* in C) or by movement of the (overt) subject to Spec,CP (which yields the infinitival clauses that lack *for*):⁶⁵

(78) **Analysis of irrealis/generic infinitives**

- a. ... [CP [T for]_j+[C, #F] [IP Sue to_j buy the book.]] ... "...for Sue to buy the book..."
 b. ... [CP [Sue, #F]_j [C, #F] [IP *t-Sue_j* to buy the book.]]... "...Sue to buy the book..."
 [compare (56)]

The *for*-trace effect arises because it is less costly to move a *wh*-subject when C bears both uT and uWh than it is to move T-to-C and separately move a *wh*-phrase to C. The *for*-omission effect arises because when *for* is missing, the subject has raised to delete uT on C. Interpretable T has not moved to C, and uT on C disappears once the CP cycle is complete.

English infinitives differ from finite clauses in allowing PRO as subject. In Standard English, *for* is excluded in such infinitives. This is the so-called "*for-to* filter" of Chomsky and Lasnik (1977):

(79) ***for-to**

- a. Sue would like [PRO to buy the book].
 b. *Sue would like [for PRO to buy the book].

If *for* is the realization of non-finite T moved to C, the exclusion of *for* can be explained if movement of T to C is impossible in an infinitival clause whose subject is PRO. Why should T-to-C movement be incompatible with PRO? There are several possibilities. One might imagine that the uT problem of C must be solved by subject movement to Spec,CP when the subject is PRO. But this would predict that an irrealis/generic infinitival CP could not function as a subject of a higher clause when its own subject is PRO. This is not the case. Such infinitives function perfectly well as subjects of a higher clause:

(80) **Infinitival subject clauses with PRO**

[PRO to buy the book] would be preferable.

One might also imagine that C lacks uT entirely when the subject of TP is PRO. Though such instances of C exist (a topic to which we return shortly), this not a viable hypothesis about irrealis/generic infinitives. If C with such infinitives lacks uT entirely, *for* would be excluded, but so would (80).

Our approach provides one other possible reason for the exclusion of *for* in irrealis/generic clauses with PRO. If C in such clauses bears an instance of uT that lacks the EPP property, C will mark uT for deletion by Agree, rather than Move — just as we saw in the case of Standard English embedded questions. The absence of T-to-C *movement* will account for the absence of *for*. Furthermore, if our proposal about embedded questions are correct, a uT feature that lacks the EPP property remains "alive" even after it is marked for deletion in the lower clause. This will allow an infinitival CP with PRO to be attracted by a higher instance of T, accounting for the acceptability of examples like (80). This analysis entails a correlation between the EPP status of uT on C and the presence of PRO in TP. We will not attempt to explain the correlation or investigate it further in this paper. Obviously, if the correlation is true, one wants to learn why it holds:⁶⁶

(81) **C-PRO Correlation**

The uT feature on C is [-EPP] in a declarative clause whose subject is PRO.

There are, however, other infinitival clauses whose subject is PRO that are excluded from subject position of a higher clause. These are infinitival clauses that do *not* receive an irrealis or generic

interpretation, but receive a realis (and typically factive or implicative) interpretation. Such clauses are found in object position:

- (82) **Realis infinitives in object position**
 a. Sue hated [PRO to learn the election results from the Internet].
 b. Sue managed [PRO to lose the game].

Once again *for* is impossible:

- (83) *Sue hated [for PRO to learn the election results from the Internet].

But realis infinitives are impossible as subjects, as discussed by Stowell 1982. For some speakers, this is a subtle effect, but others find the effect strong. It helps to contrast realis infinitives with their irrealis counterparts:

- (84) **Irrealis/generic infinitives vs. Realis infinitives in subject position**
 a. ??[PRO to learn the election results] shocked me. [realis/factive]
 b. [PRO to learn the election results] would shock me. [irrealis]
 c. [PRO to learn the election results early] is a crime. [generic]
- (85) a. ??[PRO to lose the game] proved they were idiots. [realis/factive]
 b. [PRO to lose the game] would prove they are idiots. [irrealis]
 c. [PRO to lose games like this] annoys the public. [generic]

Realis infinitival clauses are thus good candidates for one of the two analyses that we rejected when discussing irrealis/generic infinitival clauses. Either C bears *uT* with the EPP feature, and for some reason PRO, rather than T moves to delete *uT* (in which case (81) is false) — or else C lacks *uT* entirely.⁶⁷ If realis C in infinitives lacks *uT* entirely, the absence of *for* is explained by the absence of any need to check T-features on C. The impossibility of such infinitives as subjects follows from the fact that a clause without a T-feature on C cannot move to Spec,TP (by the Match Condition).

In fact, the second possibility seems to be correct. C in realis infinitival clauses seems to lack *uT* entirely.⁶⁸ The argument in favor of this view is simultaneously an argument in favor of the existence of ACX as an overarching condition on movement, in a framework that also contains the Principle of Minimal Compliance. Recall that ACX requires movement to be absolutely local. The Principle of Minimal Compliance allows attraction to violate ACX once the attractor has entered into an Agree or Move relation with some other element that has obeyed ACX. For this reason, if ACX is true, no instance of movement to Spec,CP can take place from anywhere lower than Spec,TP unless C has already attracted T or its specifier (by Move or Agree). In a feature-driven theory of movement, this means that a non-subject cannot move to Spec,CP unless C bears *uT*.

This leads us to expect something surprising if C of realis clauses lacks *uT*. Non-subjects should be unable to move to Spec,CP *inside* a clause whose head C has *uT*. That is, we expect a correlation between the external syntax of an infinitive (ability/inability to move to a higher Spec,TP) and its internal syntax (ability/inability to allow non-subject movement to Spec,CP). In fact, in a range of cases, we observe exactly this correlation. The relevant cases involve infinitives whose Spec,CP is the final landing site for operator movement. For reasons we cannot explain, the operators in these constructions are typically unpronounced in English, but have been convincingly argued to exist nonetheless by Chomsky (1977b). Infinitival arguments of degree expressions like *too* and *enough* provide a particularly clear case. Operator movement takes place within these infinitives. When the infinitive has an irrealis (modal) interpretation, the gap left by operator movement may be a subject or a non-subject:

(86) **Irrealis infinitives: movement to Spec,CP of subject or non-subject (in the *too* construction)**

- a. Bill is too short [*Op* C [__ to see Mary over the fence]].
'Bill's height is such that he cannot see Mary over the fence.'
- b. Bill is too short [*Op* C [PRO to see __ over the fence]].
'Bill's height is such that one cannot see him over the fence.'

A realis reading of the infinitive is also possible, and can be forced if the infinitive bears perfect tense. Strikingly, the non-subject gap becomes impossible:

(87) **Realis infinitives: no movement to Spec,CP of non-subject (in the *too* construction)**

- a. Bill is too short [*Op* C [__ to have seen Mary over the fence]].
'Bill's height is such that he did not see Mary over the fence.'
- b. *Bill is too short [*Op* C [PRO to have seen __ over the fence]].

ACX accounts for the contrast in (87) if C lacks *uT*. Since neither PRO nor T is attracted by C in (87b), movement of the direct object to Spec,CP is not movement of the closest possible element, nor is it movement that has been preceded by an Agree or Move operation involving the closest possible element. In (87a), by contrast, if Operator movement to Spec,CP is taking place, it *is* taking place from one of the positions that counts as maximally close to C — the subject position.⁶⁹

Another example of the same sort is provided by infinitival relative clauses. Infinitival relative clauses may have an irrealis interpretation.⁷⁰ In fact, this is their typical interpretation in English:

(88) **Irrealis infinitives: movement to Spec,CP of subject or non-subject (in relative clauses)**

- a. [A person [*Op* C [__ to talk to Bill]]] is Sue.
'A person who might (profitably) talk to Bill is Sue.'
- b. [A person [*Op* C [PRO to talk to __]]] is Sue.
'A person who one might (profitably) talk to is Sue.'

As noted by Kjellmer (1975; see also Bhatt 1999), infinitival relative clauses may also receive a realis interpretation if the head of the relative contains an assertion of uniqueness. We will not address the uniqueness requirement here, but call attention to another observation of Kjellmer's: that the realis interpretation is unavailable when the trace of relativization is a non-subject.⁷¹

(89) **Realis infinitives: no movement to Spec,CP of non-subject (in relative clauses)**

- a. [The last person [*Op* C [__ to talk to Sue]]] was contacted by the police.
'The last person who talked to Sue was contacted by the police.'
- b. *[The last person [*Op* C [PRO to talk to __]]] was contacted by the police.
'The last person who Sue talked to was contacted by the police.'

If (89b) is acceptable at all, the infinitival relative clause has only the irrealis (modal) reading that is disfavored by the context: 'The last person who one might (profitably) talk to was contacted by the police.'⁷²

Questions remain in this complex domain of data, ranging from the nature of the uniqueness requirement to the apparent absence of detectable contrasts between irrealis and realis interpretation in

some infinitives with non-subject gaps (e.g. Tough Movement). Nonetheless, the correlation between the inability of realis infinitival CPs to serve as subjects of higher clauses and their inability to host non-subject operator movement is just the correlation between the external and internal syntax of these clauses that we expect if their C lacks *uT* and ACX is correct. We therefore take the data in (86)-(89) as support for both these claims, though we recognize the need for further investigation.

12. Bottom-to-top syntax and the distinction between C and D

Let us return to those CPs whose C bears *uT*. Our account of the subject/non-subject asymmetries that arise with such clauses has relied on a property of the overall model that we have left implicit so far. The asymmetries that we have discussed arose from the fact that an instance of C that bears *uT* "has a Tense problem": *uT* must be marked for deletion so that it may eventually disappear from the structure. Consider in this light our account of the *that*-omission asymmetry (and its "*for*-omission" counterpart in irrealis infinitives). We observed that an embedded declarative CP whose C solves its "Tense problem" by attracting T ends up with T incorporated in C. As a consequence, the embedded CP may be attracted by higher T. If C solves its "Tense problem" by attracting the nominative subject, T is not incorporated in C, and the embedded CP may not be attracted by higher T.

There is a third possibility that we did not consider. In sketching the two possible outcomes when C of an embedded declarative bears *uT*, we limited our discussion to the two ways that the problem could be solved internal to CP. Suppose, however, that a CP whose head bears *uT* could wait until it is merged with higher structure to solve its tense problem. In other words, consider a derivation in which a CP is built whose head contains *uT*, where neither T nor its specifier enter into any sort of Agree or Move relationship with the *uT* feature of C. If such a derivation were possible, we would have an unwanted way of allowing declarative clauses in subject position that are introduced by neither *that* nor *for*. C could solve its tense problem in the higher clause, if the CP that it heads is attracted by a higher occurrence of T:

- (90) **Unwanted derivation of subject declarative without *that***
 [T, *u* (+EPP)] was expected [_{CP} [C, *uT*,] [_{IP} Sue will buy the book.]] ==>
 [_{CP} [C, ~~*uT*~~,] [_{IP} Sue will buy the book.]]_i [T, ~~*u*~~ (+EPP)] was expected *t*-CP_i

The derivation in (90) is excluded if the syntax has a crucially "bottom-to-top" character, as suggested in much recent work (especially Epstein et al 1998). What (90) shows is that uninterpretable features must be marked for deletion (and actually eliminated) as soon as possible. Since *uT* on C could be marked for deletion in the lower CP of (90), it had to be. This is essentially a version of Pesetsky's (1989) "Earliness Principle":

- (91) **Earliness Principle**
 An uninterpretable feature must be marked for deletion as early in the derivation as possible.⁷³

If our discussion of embedded questions and realis infinitives is on the right track, it is important to distinguish "marking a feature for deletion" from the actual disappearance of the feature itself when thinking about the Earliness Principle. The former must happen as early as possible. The latter may be delayed, under the EPP-related circumstances discussed earlier. A CP whose head bears an instance of *uT* that has been marked for deletion but has not disappeared may *behave* as if *uT* had not been marked for deletion at all. This was the case with embedded questions and irrealis infinitives. In the case of irrealis infinitives, we have just seen evidence (the possibility of non-subject movement to Spec,CP) that the *uT* feature of C is indeed marked for deletion on the lower cycle (just as required by the Earliness Principle), even though it does not disappear on that cycle.

The CPs whose head bears a T-feature after the CP-cycle is complete are the CPs that can be attracted by T. We have seen two ways in which C can bear a T-feature after the end of the CP-cycle, and two ways for it to lack such a feature:

(92) **T-features on C**

- a. C bears a T-feature after the CP-cycle is complete if⁷⁴
 - (i) C has [+EPP] *uT* and T moves to C (declarative *that*-clauses and *for*-clauses), or
 - (ii) C has [-EPP] *uT* (indirect questions and irrealis/generic infinitives whose subject is PRO).
- b. C lacks a T-feature after the CP cycle is complete if
 - (i) C has [+EPP] *uT* and the nominative subject moves to C (declarative clauses without *that* and *for*), or
 - (ii) C does not bear *uT* (*if*-interrogatives and realis infinitival clauses).

In more traditional terminology, the CPs in (92a) are the CPs that can move to Spec,TP "for case reasons". Although these CPs may (and do) move to Spec,TP when necessary in order to satisfy the featural (including EPP) requirements of T, they have no need of their own forcing them to move to Spec,TP. This is because in the first case of (92a), the T present in C is interpretable, and in the second case, the T-feature present in C, though uninterpretable, has already been marked for deletion in the CP cycle.

We could imagine a third case of (92a), in which a T-feature in C is uninterpretable but has not yet been marked for deletion within the CP cycle. As we have just seen, when it is possible for *uT* in C to be marked for deletion within the CP-cycle, it must be marked for deletion at that time— by the same Earliness Principle that ruled out the unwanted derivation in (90). What if the *uT*-feature in C cannot be marked for deletion, because C contains no local occurrence of a head or phrase that can do the job? This will never be the case in CPs of the type we have examined so far, whose heads take TP as a complement. TP, by definition, is capable of deleting *uT* on C.

One might, however, imagine a head that is identical to C in bearing *uT* and \bar{A} -features, but different from C in taking a category other than TP as its complement. Such a head would be unable to delete *uT* within its maximal projection, and therefore would always need some external head to delete its *uT* feature. If we are correct to identify nominative case (and possibly structural case more generally) with *uT*, a head of just this sort exists. It is the category usually called D.⁷⁵ C and D are very similar. Both bear \bar{A} -features. Both bear T-features (with a few exceptions for C noted above — and putting aside the analysis of inherent case on DP). C and D do differ in the type of complement that they take. We wish to end our discussion of C with the tentative suggestion that this is the *only* difference between C and D, as argued on independent grounds by Szabolcsi (1987).⁷⁶ Szabolcsi notes that C, like D, "turns a proposition into something that can act as an argument".⁷⁷

Let us see how the differences between CP and DP follow from the selectional differences between C and D. Consider a D bearing *uT* (i.e. D that heads a structurally case-marked DP). On a traditional analysis (Abney 1987), an article like *the* is D and the complement of D is NP. (We will shortly suggest a slight revision of this traditional view.)

- (93) [_{DP} [_D the, *uT*,] [_{NP} picture [of Sue]]]

In (93), the *uT* feature of D cannot be marked for deletion internal to DP. NP, we assume, lacks a T-feature. (The DP *Sue* may bear *uT*, but is inaccessible to D by ACX.) Consequently, the *uT* feature of D

simply fails to be marked for deletion on the DP cycle. For the derivation to converge, DP must be merged into a higher structure where uT on D can be deleted. An example is the passive structure of (94), where the object DP is attracted by T. The main difference between the acceptable derivation in (94) and the unacceptable derivation in (90) is the fact that the uT feature of the embedded C of (90) could have been deleted on the lower CP cycle, while the uT feature of the embedded D of (94) could not have been. This is why the DP in (94), but not the CP in (90), is attracted to the specifier of the higher TP. Note that uT on D must lack the EPP property if it allowed to delete external to DP. This will be important shortly:

(94) **DP with undeleted uT on its head**

[T, u (+EPP)] was praised [_{DP} [_D the, uT ,] [_{NP} picture [of Sue]]] ==>
 [_{DP} [_D the, ~~uT~~ ,] [_{NP} picture [of Sue]]] [T, ~~u~~ -(+EPP)] was praised

Our proposals, however, conflict with a standard syntax for English possessive DPs. A DP that contains a possessor is perfectly acceptable as the subject of a sentence, and is perfectly acceptable as the possessor of a larger DP. The question we must ask is why the internal syntax of English DPs that contain a possessor does not affect the external syntax of such DPs — as was the case for CPs:

- (95) a. [Mary's criticism of Sue] was praised.
 b. [Mary's cousin's criticism of Sue]

The expectation that the presence of a possessor inside DP might affect its external syntax arises if the possessor phrase is the specifier of the highest head of the larger DP — i.e. if it is the specifier of D, as proposed by Abney (1987) and others. According to this view, possessive 's belongs to the same category as *the* and *a*, thus explaining the fact that they are in complementary distribution. The fact that 's follows the entire possessor DP (as in *the king of England's throne*) is explained if the possessor is the specifier of 's (either as the result of movement from NP or direct merger). These are results that we do not wish to lose. On the other hand, if 's (along with *the* and *a*) is the highest head of DP, problems arise.

In particular, the assumption that 's is the highest head of DP (i.e. D) conflicts with our view that movement is feature-driven. Let us consider what feature of 's might cause the possessor DP to move to its specifier position, and what consequences this has for the external syntax of DP, if 's is an instance of D. If the feature driving movement to the specifier of 's is uT , we must then posit an instance of uT on 's that has the EPP property. (By the Match Condition, the possessor DP must also bear uT .) As a result, uT on 's would be marked for deletion within DP by the raising of the possessor. If D and C are the same category, we expect the deleted uT feature on D to disappear once DP is complete. Consequently, if 's is an instance of D, DP should not behave like a category whose head bears uT once DP is merged into a higher structure. Movement of this DP to Spec,TP should be impossible. This is an incorrect result, as (95a) shows. Suppose alternatively that the possessor is attracted by some other feature on 's — call it uF . If this were the case, we would not have to assume that uT on D has the EPP property. Consequently, even if the possessor were to mark uT on D for deletion, uT would be able to remain "alive" after the DP cycle is complete. However, uF would not remain alive, since uF , by hypothesis, would have the EPP property. This too leads to an incorrect result if 's is an instance of D. A DP containing a possessor would be a DP that does not bear uF on D once the DP cycle is finished. Consequently, a DP containing a possessor should be unable to function as a possessor of a higher DP. Example (95b) shows that this result is also wrong.

We therefore tentatively drop the assumption that 's, *the* and *a* are the highest head of DP. We propose that 's, *the* and *a* are not instances of D, but belong to a category that we may call R ("*article*"). RP is the complement of D, which is null in English. We maintain the common view that possessors occupy the specifier of 's — now understood as the specifier of RP: The possessor is attracted to 's by

some feature on 's with the EPP property. Whether this feature is uT or uF remains unclear. In (96a) below, we adopt uF for ease of presentation:

- (96) a. $[_{DP} [D, uT (-EPP),] [_{RP} [_{DP} \text{Mary}, uT, F]_i [_R 's, \#F (+EPP)] [_{NP} t_i \text{criticism [of Sue]]]]]$
 b. $[_{DP} [D, uT (-EPP,) [_{RP} [_R \text{the}] [_{NP} t_i \text{criticism [of Sue]]]]]$
 c. $[_{DP} [D, uT(-EPP,) [_{RP} [_R a] [_{NP} t_i \text{picture [of Sue]]]]]$

The fact that English D is phonologically null in DPs like those of (96), of course, is yet another respect in which English C and D are alike. At the same time, the existence of DPs like *all Sue's pictures of Mary* and *all the pictures of Sue* may suggest variants of D that are not phonologically null. It is also worth noting that the structures we propose in (96) are close to those proposed for Hungarian DPs by Szabolcsi (1983; 1987), whose proposals were further developed by Kayne (1993) — and it is worth noting that possessors in Hungarian and other languages are often morphologically nominative.

We began this paper with several classic observations about asymmetries in the theory of case and in the behavior of the English complementizer system. If we are correct, the proper treatment of one of these asymmetries — the T-to-C asymmetry — leads us immediately to an understanding of a wide range of other phenomena, including (but not limited to) those with which we began this paper.

NOTES

* It is with equal amounts of pleasure and humility that we dedicate this paper to Ken Hale, our colleague, teacher and friend for many years. We are also grateful to him for discussing this work with us, and especially for offering the marvelous example of Pittapitta (see below).

In addition, we wish to thank E. Anagnostopoulou, J. Aoun, A. Benmamoun, C. Boeckx, L. Cheng, N. Chomsky, B. Citko, S. Epstein, D. Fox, H. Haider, S. Iatridou, R. Kayne, H. Lasnik, J. McCloskey, A. Munn, M. Prinzhorn, N. Richards, and K. Sainz for useful conversations about this work. We also wish to thank the students and visitors at MIT who improved the work with their questions and comments, as well as audiences at New York University, WCCFL (University of Arizona), the University of Vienna, the LSA Summer Institute at the University of Illinois and SUNY Stony Brook. Thanks also to M. Kenstowicz for helpful comments on an earlier draft and for generous editorial patience. We are also grateful to J. Nissenbaum for a very thorough reading of the manuscript and for many insightful comments and suggestions.

As we were writing this paper, we learned of the research of Haerberli (1999), who, like us, argues that nominative case (and structural case more generally) is μT on D. He develops this idea in a different way than we do here. We hope to compare his work with ours in the near future, with a view to integrating the two bodies of research.

The authors' names are listed alphabetically.

¹ The possibility of focused *did* is independent of *wh*-movement, and thus irrelevant to our concerns: cf. *Mary did buy the book!* We assume, with Chomsky (1957) and Laka (1990), that *do*-support is triggered by an affirmative counterpart to *not* (Chomsky's morpheme A, Laka's \bar{A}) whose phonological content is stress or high pitch.

² A similar proposal was advanced by Rizzi (1996, 68).

³ In Rizzi's (1990) account of the *that*-trace effect, English clauses without *that* were taken to be headed by an unpronounced complementizer containing Agreement morphology which properly governed the subject position. In such a theory, it becomes puzzling why an overtly agreeing auxiliary verb like *did* does not also govern the subject position once moved to C.

⁴ Huang (1982) suggested that the island-sensitivity of adjunct extraction was a consequence of the ECP effect akin to the *that*-trace effect. This suggestion, as developed by Lasnik and Saito (1984, 1992) and others led to a vigorous "afterlife" for ECP research, some of which, oddly enough, failed to take into account the subject/non-subject asymmetries that had motivated the ECP in the first place. We will not discuss adjunct extraction in this paper.

⁵ Chomsky (1995) suggested that this operation involves literal movement (copying) of features of the attractee to the attractor ("Feature Movement"). It will be of some importance to our proposals that this hypothesis is incorrect, and that Chomsky's later (1998) proposal, in which Agree does not involve any copying of features, is correct.

⁶ The term "EPP" derives from the "Extended Projection Principle" of Chomsky (1981), which required of T (then called "Infl") that it have a specifier. In Chomsky (1998), it is suggested that other heads have versions of the same requirement. We suggest below that the choice between phrasal and head movement is predictable, and that a unified "EPP property" can therefore be taken to be the motivation for movement of all sorts. Our suggestion that both head movement and XP movement may satisfy an EPP property of a feature is similar to recent proposals by Alexiadou and Anagnostopoulou (1998).

⁷ This use of the term "attract" is slightly non-standard. It follows terminology of Chomsky (1995, Chapter 4), where the operation that we call Agree (following Chomsky 1998) was viewed as actual movement of a feature.

⁸ The bracketed restriction to English matrix questions is for expository purposes only. We discuss other instances of C (and other instances of T-to-C movement) below.

⁹ The literature contains some skepticism about whether nominative *wh*-phrases really do move to Spec,CP in questions like (5d) (Gazdar 1981; Chung and McCloskey 1983; Chomsky 1986). One argument that they do can be found in the distribution of expressions like *the hell* (Pesetsky 1987) that attach to *wh*-phrases. As noted by Pesetsky, these phrases are allowed only on *wh*-phrases that have overtly moved to Spec,CP:

- (i) a. What the hell did Sue give to whom?
b. Who the hell did Bill meet where?
- (ii) a. *What did Sue give to whom the hell?
b. *Who did Bill meet where the hell?

As Ginzburg and Sag (to appear) point out, they are quite possible on nominative *wh*-phrases in the interrogative clauses under consideration. This seems to argue that they have moved to Spec,CP:

- (iii) Who the hell bought what?

We can also be fairly sure that the presence of *the hell* on fronted *wh*-phrases is not just a second-position effect, since *the hell* occurs freely with a nominative *wh*-phrase that introduces an embedded question, as in (iv), but not with a nominative *wh*-phrase at the left edge of an embedded declarative that is clearly not in Spec,CP:

- (iv) Who wondered who (the hell) bought this book?
- (v) Who believed who (*the hell) bought this book?

Another argument making the same point is implied by Lasnik and Saito (1992, 101-102).

¹⁰ By claiming that nominative case is *uT* on D, but that the association of a nominative DP with T is driven by *u* on T, we unite both sides of an old debate about whether nominative is "really" assigned by tense or by agreement. (e.g. George and Kornfilt 1981, Chomsky 1981, Raposo 1987, Raposo and Uriagereka 1990 for Agreement vs. Rouveret and Vergnaud 1980, Chomsky 1980, Guéron and Hoekstra 1988 for Tense; among many others). There is also a point of similarity between our proposal that *uT* is present on finite C and Bittner and Hale's (1996) proposal that C is crucially involved in case assignment more generally.

¹¹ We use "closeness" and "closer" as technical terms somewhat different from their use in ordinary language. In particular, the relation is not transitive, since (for example) in a simple clause of the form:

[C [Spec,TP T [V...]]]

-- both TP and Spec,TP count as equally close to C, but only Spec,TP is closer to C than V. TP is not closer to C than V because it dominates V. We thank Iris Mulders (personal communication) for noting this possible source of confusion.

¹² We assume that head movement yields an adjunction structure, though other possibilities are conceivable.

¹³ We take up the possibility that the nominative subject *Mary* might be attracted by *uT* in *C* even in (14a) (forming a second specifier of *CP*) below..

¹⁴ The EPP property of two distinct uninterpretable features is satisfied by a single instance of movement here. The presence of the EPP property on an uninterpretable feature *uF* must therefore be nothing more than the requirement that the element with which *uF* enters an Agree relation must be copied into the very local domain of the bearer of *uF*. It does not matter which feature actually triggers the copying.

¹⁵ Some of the diverse research that goes by the name of "functionalist" can be seen as alternative attempts to rescue as much of the Extreme Functionalist hypothesis as is consistent with the actual facts of human language. For example, some research in this tradition acknowledges the existence of morphemes with no semantic content, but suggests that such morphemes always arise historically from morphemes that do have semantic content — a process called "grammaticalization". (See Newmeyer 1998 for a critique of this notion.) Other work argues that purely grammatical morphemes only occur synchronically insofar as they belong to larger units with designated semantic content, often called "constructions" (Goldberg 1995). In contrast, the non-functionalist literature has largely turned its back on the entire issue, taking as fact the observation that some grammatical features have a semantic value, and others do not. Our proposal in this sense is closer to the functionalist tradition than to the non-functionalist tradition.

¹⁶ Strictly speaking, Chomsky suggests that the relevant feature is "structural case", unspecified for nominative or accusative, but he does take this feature to lack semantic value in every context.

¹⁷ We take it for granted that actual nominative case lacks semantic content entirely. This view was challenged by Jakobson (1936/1984). He agreed that a unitary meaning for nominative cannot be detected, but argued that nominative case does have semantic content, which derived from its status as the unmarked member of the pair nominative-accusative. The meaning of nominative is, for Jakobson, the complement set of the meanings associated with the other cases (including accusative), hence the absence of a unitary characterization. The present paper, if correct, constitutes an argument against this view.

Still, the dichotomy "interpretable"/"uninterpretable" may in the end turn out to be too crude. While agreement on *T* is plausibly devoid of semantics, *DP* does have tense properties of some subtlety and complexity, studied by Enç (1981), Musan (1995) and others. Furthermore, *DPs* in Somali (Lecarme 1997) and in languages of the Salishan group (Demirdache 1997) overtly express tense on *DP* in a variety of ways. (In Somali, a present/past interpretation is accorded to the proximate/distal system.) Thus, the presence of tense features on *DP* in a language like English, while "uninterpretable" in some sense, might have some roots in the semantics of *DP* after all. We have not investigated these matters, and will treat the tense features of *DP* as strictly uninterpretable in this paper. We are aware that future work may cause us to qualify this view.

¹⁸ Chomsky (1998) argues from the existence of "defective intervention effects" that uninterpretable features are initially unvalued, and receive values (e.g. specific values for person, number, etc.) as a by-product of the rule Agree (either on its own or as a subcomponent of Move). It is possible that only the features of the attractor in an Agree operation receives values in this manner. The features of the attracted element might remain unvalued, in which case the observed asymmetry is accounted for. This, of course, would make Pittapitta discussed below, rather than English, the surprising case.

¹⁹ We are grateful to Abbas Benmamoun and Joseph Aoun for bringing these facts to our attention.

²⁰ More to the point, argumental locative PPs in languages like English must be viewed as bearers of *u*T, especially in the construction known as Locative Inversion (*In the center of the room sat a frog.*). This is not unreasonable, especially given the fact that in Chichewa (Bresnan and Kanerva 1989) locatives behave in this construction entirely like nominative DPs in Indo-European languages, triggering verbal agreement and other processes characteristic of subjects. In English, they behave like nominative subjects for the T-to-C asymmetry (*In the center of which room sat/*did sit a frog?*) and for the *that*-trace effect (*In the center of which room do you think (*that) sat a frog?*; Bresnan 1977). In Dutch (Mulder and Sybesma 1992), argumental locative PPs are obligatorily pre-verbal in embedded clauses, like structurally case-marked accusative DPs, while other PPs may occur post-verbally. Space limitations prevent us from pursuing this extension of our proposals here.

²¹ This proposal is a version of the "dependent case" theory of Marantz (1991). Compare also the Richards's (1997) hypothesis that nominative and accusative case depend on a link to an "AgrP" common to the two cases. These proposals can be naturally extended to ergative/absolutive languages, as Marantz shows.

²² We also put aside occurrences of nominative case morphology that may arise by agreement with a nominative DP (e.g. nominative adjectives and predicate nominals), as well as occurrences that might represent "default case", in the sense of Schütze (1997).

²³ The similarity between (5) and Richards' Principle of Minimal Compliance was independently noted by Platzack (*to appear*).

J.Nissenbaum (p.c.) points out that Richards' constraint has a derivational character not motivated by the phenomena that we have discussed so far. No fact so far has indicated whether T-to-C movement precedes or follows *wh*-movement in the derivation of a sentence like *What did Mary buy?*

²⁴ The PMC is incompatible with Rizzi's (1996) claim that T which moves to C in an interrogative clause bears *u*Wh. If T were to bear *u*Wh, then movement of T to C would satisfy ACF for *u*Wh on C, and we would find no Superiority Effect, contrary to fact.

²⁵ ACX is in this respect quite similar to Chomsky's (1998) "Phase Impenetrability" condition, except that TP for Chomsky (and, ultimately, for us) cannot be regarded as a phase elsewhere. There is also a strong similarity to much earlier proposals by Koster (1978a), whose Bounding Condition stipulated that all maximal projections should be regarded as islands for extraction, with their specifiers functioning as "escape hatches".

²⁶ This requirement might be motivated by ACX, depending on what other movement takes place to other possible landing sites. Otherwise, we assume that other constraints force successive-cyclic *wh*-movement.

²⁷ It is important to remember that the head of a declarative clause may perfectly well bear *u*Wh, since *u*Wh is an *uninterpretable* instance of the *wh*-feature. The *wh*-feature is the property that is interpretable on *wh*-phrases. We assume that there is a distinct interpretable feature *Q* on interrogative complementizers, which (by a "Match Condition" presented later in (58)) entails the presence of *u*Q on *wh*-phrases, but this detail will not be important to us here.

²⁸ In both Belfast English and in Spanish, movement of a relative pronoun does not trigger (overt) T-to-C movement of the sort demonstrated here. By contrast, in French, relative pronoun movement does trigger successive-cyclic T-to-C movement (M.C. Boivin, personal communication). We do not have an account of this asymmetry — though our overall proposal will make it possible to analyze relative clauses as involving successive-cyclic *wh*-movement without necessarily triggering overt T-to-C. See the discussion of English embedded questions in section 6.

²⁹ There is controversy about the analysis of (26) as T-to-C movement. For alternative proposals, see Suñer (1994), Ordoñez (1997) and Barbosa (1999) among others. For dialect variation, see Baković (1998).

If we are correct to group the Belfast English data in (25) with the Spanish data in (26) (in agreement with Henry (1995)), then the phenomenon in question cannot be seen as a way of avoiding barriers to *wh*-movement that are (allegedly) created by overt specifiers — the hypothesis of Uriagereka (1999).

³⁰ For present purposes, we assume that the Spanish and French data display adjunction of the moved finite verb (pied-piped by T) to the right side of C. Right-adjunction of this sort is sometimes argued to be impossible, since it falls outside the range of possibilities allowed under the "Antisymmetry" hypothesis of Kayne (1994) and similar proposals. We hope to return to this matter in subsequent work.

³¹ Our treatment of *that* also recalls clitic doubling constructions in Romance and elsewhere, as well as "partial *wh*-movement" constructions in German and other languages. These are cases in which some features of an element left in situ appear in a position arguably created by movement:

- (i) Juan la vió a Mafalda.
 Juan her-ACC saw to Mafalda
 'Juan saw Mafalda' (Jaeggli 1982)
- (ii) Was glaubt Hans mit wem Jakob jetzt spricht?
 what believes Hans with whom Jakob now talks
 'With whom does Hans believe that Jakob is now talking?' (McDaniel 1989, 569)

The treatment of both of these constructions is an open issue. If these constructions are instances of doubling akin to our treatment of *that*, it may be possible to develop a wider theory of doubling constructions. In this light, the research of Anagnostopoulou (1998; 1999) on clitic doubling in Greek is particularly interesting, since it appears to show local clitic doubling of indirect object DPs licensing longer than expected A-movement of the direct object — an interaction reminiscent of ACX, if clitic doubling (at least in Greek) is a realization of movement.

³² It is crucial to our explanation of the *that*-trace effect that long-distance *wh*-movement must proceed via Spec,CP (as a consequence of the Subjacency condition or whatever derives its effects). Because *wh*-movement must proceed successive-cyclically, the nearest C must bear *uWh*. If the nearest C lacks *uT*, there will be no *that*-trace effect, but the *wh*-phrase will leave CP without passing through its specifier.

³³ The analysis in (36) shows two specifiers of CP. English, of course, does not permit more than one overt *wh*-specifier of CP (as illustrated in multiple questions), but that is not the situation in (36). See

our discussion of exclamatives (example (44) below) for another example of multiple Spec,CP in English. We are grateful to J.Nissenbaum (p.c.) for this observation.

³⁴ Our results, as reported here, depend on TP being the complement of C. Recent proposals by Rizzi (1997), and Cinque (1999) that argue for functional heads between T and C are incompatible with these results. If the structures proposed by Rizzi and Cinque are correct, we believe that our core results can be recast in their terms, once one allows for T-movement to these higher functional heads preceding attraction of T to C.

³⁵ It has, of course, been argued that multiple specifiers count as equidistant from higher nodes (e.g. by Chomsky 1998, whose concern is the ability of the external argument generated as a specifier of vP to be attracted to Spec,TP over a higher specifier of vP).

³⁶ As J.Nissenbaum (p.c.) has pointed out to us, the logic of the situation requires ACX to outrank Economy, in that an Attractor picks the attraction pattern that involves the fewest operations (Economy) from the set of attraction patterns that satisfy ACX.

³⁷ The existence of alternative parses for crucial examples make it hard to determine whether *that* is obligatory, as predicted. If we drop the *that* in (41a-b), the result is not terribly unacceptable, which might seem to contradict our proposals. The problem is, the phrases *for all intents and purposes* and *to the rest of us*, which clearly precede Spec,TP in (37)-(38) and arguably may precede Spec,TP in (41a-b) (allowing *that*), can be analyzed as parentheticals that follow Spec,TP in the counterparts to (41a-b) without *that*. On this parse, we expect a *that*-trace effect, rather than an anti-*that*-trace effect:

- (i) Sue met the man who Mary is claiming __ [for all intents and purposes] was the mayor of the city.
- (ii) Bill, who Sue said __ [to the rest of us] might seem a bit strange, turned out to be quite ordinary.

An issue also arises in matrix questions, where topicalization does not obviate the T-to-C asymmetry, which otherwise tracks the *that*-trace effect, as we have seen:

- (iii) *Who [for all intents and purposes] did buy the book? (* except if *did* is focused)
- (iv) *Who [to the rest of us] did seem strange? (* except if *did* is focused)

Here, the interfering factor is not only the availability of a post-subject position for *for all intents and purposes* and *to the rest of us*, but also the fact that topicalization (and fronting more generally) is not permitted between C and the nominative subject in matrix questions. Instead, the landing site seems to precede CP:

- (v) *What did [for all intents and purposes] Mary buy __?
- (vi) *How strange did [to the rest of us] Bill seem __?
- (vii) [For all intents and purposes], what did Mary buy?
- (viii) [To the rest of us], how strange did Bill seem __?

The acceptable counterparts to (iii) and (iv) without *did* (presented in (ix) and (x) below) once again probably show the bracketed phrase in a position after the nominative subject:

- (ix) Who [for all intents and purposes] bought the book?
- (x) Who [to the rest of us] seemed strange?

³⁸ Another "anti-*that*-trace effect" is found in English relative clauses, where subject extraction requires an overt *wh* or *that*, and disallows the absence of both. We will not discuss these facts here.

³⁹ Possibly the near obligatoriness of interjections like *boy* in non-*wh* exclamatives with T-to-C movement like *Boy, is syntax easy!* (N.McCawley 1973) might arise from the need to supply a non-*wh* Spec,CP. While N.McCawley offers many examples of exclamatives that lack an initial interjection, they all seem to us to require something preceding the fronted auxiliary, even if it is only a whistle or a sharp intake of breath. Perhaps one could argue that the whistle or intake of breath occupies Spec,CP, in conformity with (45).

⁴⁰ The judgment in (46) seems to be extremely secure, but judgments waver with unaccusative verbs, e.g. (?) *What a strange package just arrived!*

⁴¹ This fact may be of deeper significance, if the realization of T in C as *that* is tied in some way to the anaphoric function of *that* in its other capacity as a (demonstrative) pronoun. It could be that *that* is available as a realization of T only when in the c-command domain of another occurrence of T, possibly with consequences for sequence of tense interpretation. Remarks about the semantics of *that*-omission in Swedish by Platzack (1998) may reinforce this view, as do suggestive observations about English by Ritter and Szabolcsi (1985). This property would also prevent *that* from occurring in matrix clauses more generally — assuming that root declarative sentences are CP rather than TP. See Szabolcsi (1987) for an alternative view.

⁴² Much the same facts were observed by Keyser (1975) in Middle English relative clauses. Nominative *who* (an innovation of the Middle English period) was never followed by *that*, while non-nominative *whom* often was.

⁴³ Obviously, one wants the reference to "embedded" vs. "matrix" clauses to follow from other properties of the theory, but we will not explore this area here.

⁴⁴ We leave open whether matrix *declarative* clauses are CPs or TPs, as discussed in note 41. If they are CPs, it is quite possible that matrix declarative C also bears *uT*. If this occurrence of *uT* has the EPP property, then perhaps some factor like the one discussed in that note requires the nominative subject, rather than T, to delete *uT* on C.

⁴⁵ This might explain the apparent absence of a *que*-trace effect in Spanish (Perlmutter 1971). It has, however, been argued that counterparts to this effect do exist in the area of scope (Kayne 1981; Rizzi 1982; Piccolo 1984). Jaeggli (1982, 1984) made this argument for Spanish. We assume for the purposes of this paper that restrictions on wide scope do not follow from the same factors that yield the *that*-trace effect. A fuller investigation of these matters would also take up the phenomenon of *que/che* omission in *pro*-drop Romance languages, which have also not fully investigated.

⁴⁶ Subject-movement to Spec,CP is not possible in these examples (that is, the embedded clause must be introduced either by *az* or by the fronted verb). Perhaps multiple specifiers of CP are not allowed in Yiddish.

⁴⁷ Example (57) raises the possibility that the ban on movement from an A-bar to an A-position (so-called "improper movement") might be explained as a consequence of the lifespan of features marked

for deletion. Traditional accounts, in which movement for "case reasons" is always movement to an A-position, are undermined by our argument that movement to Spec,CP takes place to delete *uT* — i.e. for "case reasons".

⁴⁸ Chomsky argues that both CP and *vP* are "phases". We take no stand here on whether *vP* is a phase akin to CP. For some evidence in favor of this view, see Nissenbaum (in prep.).

⁴⁹ The observation that *uT* must be present on DP for T to successfully attract it is the counterpart in our system to Chomsky's (1998) proposal that a Case feature must be present on DP if T is to attract it. For Chomsky, this requirement is a special case of a more general requirement that a phrase must contain some uninterpretable feature in order to be attracted. The key example involves case, where it is assumed that the absence of a case feature on a potential attractee makes it ineligible for attraction by T but capable of preventing T from attracting other phrases. The Match Condition may have this effect as well, except that it relies on the idea that case on DP is not a *sui generis* uninterpretable feature, but an instance of a feature present on T.

⁵⁰ The word *some* is important, since a C bearing *uWh* and *uT* may attract a phrase bearing T that lacks *wh* (e.g. TP) and may attract a phrase bearing *wh* that does not bear T (e.g. *how* or *with whom*) — in two distinct operations.

It is important that T not bear *uWh* (at least in English), or else movement of T to C could obviate the Superiority Condition, given the Principle of Minimal Compliance that allows interrogative C to attract a *wh*-phrase that is not the closest once it has attracted an instance of the *wh*-feature that does count as closest.

⁵¹ As noted in passing in section 1, we assume CP bears *-features* — third person singular in the languages familiar to us, though under certain conditions conjoined CPs behave as plurals. We do not explain the intriguing fact that CP in a variety of languages cannot be the antecedent for a null pronoun (Iatridou 1991, Iatridou and Embick 1997), a fact which Iatridou and Embick linked to a claim CP does not bear *-features* at all.

⁵² Koster (1978b) argued that CPs introduced by *that* are never subjects, but occupy a topic position with distinct properties. Some of the evidence adduced in favor of this claim seems incorrect to us. For example, Koster's claim that auxiliary verbs cannot be fronted over a putative subject *that*-clause seems to us an intonational effect. Examples such as *Did that Sue bought the book really bother you?* are hard to parse unless the *that*-clause is destressed, but seem acceptable otherwise. We therefore assume that subject CPs do exist, and that subject *that*-clauses do not necessarily have the syntax of topics. See Piera (1979) for other arguments to this effect from English, French and Spanish. On the other hand, if topics are specifiers of TP, as we cautiously suggested in section 4, one might accept Koster's proposal without giving up the claim that the *that*-omission asymmetry is due to the ability of CP to be attracted by T.

⁵³ Our Match Condition plays much the same empirical role as Chomsky's (1998) requirement that attracted phrases bear an uninterpretable feature (that they be "active", in his terminology), while differing from his proposal conceptually. Our Match Condition can generate "defective intervention effects" of the sort discussed by Chomsky if the nearest bearer of a feature F sought by an attractor X fails to bear some other feature of F. In languages in which a dative DP blocks an Agree relation between a lower nominative DP and T (despite the dative being unable to move to T itself) — e.g. Spanish (Torrego 1983/1986) — we would speculate that the dative DP lacks *uT* (though it has *-features*).

⁵⁴ Movement of T to C would, of course, delete u on T just as effectively as movement of the subject to Spec,TP, but would not satisfy the EPP property of u on T. When a feature uF on X has the EPP property, some element that bears F (interpretable or uninterpretable) must merge with X or a projection of X.

⁵⁵ We suggested in section 4 that topicalized phrases are outer specifiers of TP, which probably means they are attracted by some uninterpretable feature of T with the EPP property. In this connection, it is interesting to note that topicalized object CPs behave like subjects in requiring the presence of *that*:

- (i) a. [That Sue bought the book] we all know.
- b. *[Sue bought the book] we all know.

We leave the connection between topicalization and uT as an open issue that we do not fully understand at this point. See also note 52.

⁵⁶ We use *which book* rather than *what* to exclude a free relative reading of the main clause subject: cf. **I read which book Mary read yesterday*.

⁵⁷ J.Nissenbaum (p.c.) points out that (64) allows an ungrammatical counterpart to (57) with an embedded question as subject (compare (62)).

- (i) *[Which person will read the book] is expected [_{CP}* __ is unknown].

The problem arises if uT on C of the embedded question is not only still alive at the end of the embedded question cycle (necessary to allow (62)) — but even at the end of the cycle labeled CP*. Conceivably, the principle governing the elimination of uninterpretable features might be slightly different from (64). Once uT on the embedded question has participated in the movement operation triggered by T of CP*, it disappears — like any other uninterpretable feature marked for deletion — at the end of the CP* cycle. This might suggest that uninterpretable features directly involved in a Move operation are the ones that must delete at the end of CP cycle. On the other hand, this way of thinking comes into conflict with the proposal concerning pied piping sketched at the end of this section. We leave this as an unsolved problem.

⁵⁸ We owe this approach to subject/non-subject contrasts to discussions with Marie-Claude Boivin. In Boivin (1999a, 1999b), she proposed that a contrast in French *en* cliticization be attributed, not to the ECP, as in Pollock (1986), but to the inability of a clause from which *en* has been extracted to raise to subject position. This logic inspired our proposal, though her development of this idea differs from ours in several details.

⁵⁹ An echo of the ECP can be found in ACX, which, like the ECP, attributes the specialness of subject *wh*-movement to the strictly local relation between the subject position and Spec,CP.

⁶⁰ Pesetsky (1998), assuming an ECP account of the *that*-omission asymmetry (and structures like those in (69)), suggested that embedded questions in subject position escape the effects of the ECP because the constraints that give rise to the obligatory absence of *that* in embedded questions outrank the ECP (in the sense of Optimality Theory). The EPP account may in the end turn out to be more principled, though (as noted above) more evidence in its favor is necessary before we can draw this conclusion. If the phonological "emptiness" of C is irrelevant, as argued here, the overall account of Pesetsky (1998) must be rejected in any case.

⁶¹ Probably the features missing from *if* clauses are the \bar{u} -features, rather than uT . The evidence comes from the "*wh*-trace effect", often grouped with the *that*-trace effect in ECP accounts (Chomsky 1979; 1981):

- (i) a. ??What passage do you not know how Sue translated __?
- b. *Who do you not know how __ translated this passage?

The contrast between (ia) and (ib) does not fall together with our account of the *that*-trace effect, but is an instance of a "Nested Dependency Effect" (Kuno and Robinson 1972, Pesetsky 1982b, Richards 1997). *How* moves from a position lower than *who*, crosses *who*, and ends up in a position lower than *who*. Much the same analysis can be given for this effect in a *whether*-question, if *whether* originates lower than the subject (perhaps in the specifier of Laka's (1990) head \bar{u} , the generalized version of Pollock's (1989) NegP), and undergoes *wh*-movement from there:

- (ii) a. ??What passage do you not know whether Sue translated __?
- b. *Who do you not know whether __ translated this passage?

The point of interest now is the fact that these effects are also observed in *if*-questions:

- (iii) a. ??What passage do you not know if Sue translated __?
- b. *Who do you not know if __ translated this passage?

We may view this contrast too as a Nested Dependency Effect if *if*-interrogatives involve *wh*-movement of a null version of *whether* to the specifier of *if*. If ACX is true, as we argue below, this means that *if* must bear not only uWh (which triggers *wh*-movement), but uT (without EPP) as well, or else movement of the null version of *whether* from below TP would violate ACX. The presence of uT on *if* allows it to attract TP or its specifier. The absence of \bar{u} -features on *if* does not prevent it from attracting a lower occurrence of T, but does prevent it from being attracted by a higher occurrence of T due to the asymmetry in the Match Condition: the attractee may have features missing from the attractor, but the attractor must not have features missing from the attractee.

⁶² *To* \bar{e} is not freely available as an alternative to \bar{e} in object position. It is most commonly available when a DP in object position would show a case other than accusative (B.Citko, p.c.). In this respect, it differs from English *that*.

⁶³ The possibility of subjunctive clauses introduced by *that* in many of the environments where irrealis *for*-clauses are found (especially as complements of jussive and volitional verbs) is in keeping with this generalization (*I would prefer that Sue buy this book. I demanded that Sue buy this book.*). The fact that *that*-omission (*che*-omission, *que*-omission, etc.) is possible in some Romance languages but limited to the subjunctive might suggest that in these languages, subjunctive clauses, rather than indicatives, are the counterparts to the English indicative.

⁶⁴ See Browning (1996, p. 238 fn. 2) for reasons why *for*-trace effects are not ameliorated by the intervention of adverbs, as is the case with the *that*-trace effects of (example (41)).

⁶⁵ We treat the subject of these infinitives as nominative, despite the fact that pronominal subjects appear as *me*, *him*, *her*, etc. rather than *I*, *he*, *she* etc. We assume, with Emonds (1986) that the *I/me* distinction is not a nominative/accusative distinction, but a low-level rule that assigns the *I* form to

pronouns standing alone as subject of finite T. This is supported by the widespread use of the *me* series in positions where other languages would show nominative case. If, however, we extend our theory of *uT* to accusative, we might be able to treat these subject pronouns as accusative, if that should turn out to be correct.

⁶⁶ One other possibility: T-to-C movement does take place, but *to* moves directly rather than being doubled by *for* -- analogous to Belfast embedded aux-to-C vs. Standard English *that*. This is unlikely since *to* appears to be just as low in clauses with PRO as elsewhere. It can be preceded by *not*, adverbs, and similar elements.

⁶⁷ Instead of lacking *uT*, C might lack *̣*. This would raise the question of why *for* fails to occur (if C has *uT* with the EPP property), but also fails to explain the effects in the text below.

⁶⁸ In a sense, our analysis is quite similar to Stowell's (1982) proposal. He suggested that irrealis infinitives differ from realis infinitives in having T in C. For him, the T in question was assumed to be interpretable, with irrealis interpretation somehow following from the presence of T in C. He also suggested that T in C, though null, suffices to classify C as a non-empty category, hence exempt from the ECP. For us, it is the T in C itself — whether interpretable or uninterpretable, empty or non-empty — that licenses CP as a subject.

⁶⁹ It is not completely clear that the subject gaps are syntactically bound by an operator moved to Spec,CP. This option appears unavailable in infinitival questions (**I wonder who to solve this problem.*).

⁷⁰ More precisely, the interpretation of infinitival relatives involves modality, often either *should* or *could*. See Hackl and Nissenbaum for an interesting account of the distribution of these readings. We have not investigated how these distinctions interact with the data discussed in this paper.

⁷¹ We are grateful to Rajesh Bhatt for bringing Kjellmer's work to our attention. Bhatt (1999) argues that the realis infinitives in (89) are reduced relatives that lack a CP projection and do not involve operator movement at all. This claim is logically consistent with our proposal, though (if true) it would remove (89) as an example of short-distance movement to Spec,CP. It seems difficult to give a reduced relative analysis to (87a), however.

⁷² Long distance *wh*-movement of a non-subject out of a realis infinitive should be impossible if the *wh*-phrase must stop in the specifier of the infinitive. An example like *Which election results did Mary hate to learn from the Internet?* is awkward, but not impossible. Consequently, it must not be obligatory for *wh*-movement to land in Spec,CP of a realis infinitival, though it must be obligatory in other clause-types, or else the *that*-trace and *for*-trace effects would not be observed. This suggests that the presence of T, including uninterpretable T, creates an island, much as was suggested in earlier work that proposed a "Tensed S Condition" (Chomsky 1977a).

⁷³ The Earliness Principle in the form given here can replace the carefully worded Economy Condition in (6) as the reason for the T-to-C asymmetry, the *that*-trace effect and the other effects grouped with these in our proposal. When a C bearing *uT* and *uWh* can mark both features for deletion with a single operation, the Earliness Principle requires it to do so, and rejects alternatives in which it deletes one of the features later than the other.

An interesting difference between the two approaches arises from the possibility that a C with *uT* and *uWh* in a question like *Who bought the book?* might enter a second Agree (or Move) relation with TP after it has attracted the nominative *wh* phrase. This is a possibility made available by our proposals

concerning the lifespan of uninterpretable features (section 6). Multiple Agree and multiple Move operations triggered by a single uninterpretable feature are attested, and are consistent with the proposal that uninterpretable features marked for deletion do not disappear instantly.

For example, *uWh* on C in multiple questions seems to enter multiple Agree and multiple Move relationships with several *wh*-phrases (as argued by Koizumi (1995) for Bulgarian; see also Pesetsky 2000). In section 2, we speculated that *u* on finite T might enter into an Agree or Move relation with both nominative subject and accusative object — with the nominative/accusative distinction on DPs reflecting whether its link to T was established first or second in the derivation.

The possibility that *uT* on C might also enter into multiple Agree or Move relations might help us understand a well-known alternation in French. French finite clauses are normally introduced by *que* — which we might analyze as an instance of T moved to C (like English *that*). (This analysis would conflict with the assumption that the Stylistic Inversion seen in (27) is an instance of T-to-C, since *que* and an arguably fronted verb cooccur in this construction. Conceivably, the proper analysis of French Stylistic Inversion should view the construction as an instance of (apparently) rightward subject movement rather than leftward T-to-C movement. For an analysis along these lines, see Kayne and Pollock 1999.)

When a subject *wh*-phrase has been extracted from a clause, the clause is introduced by *qui* instead of *que* (Kayne 1977; Chomsky and Lasnik 1977), as the contrast between (ia) and (ib):

- (i) a. Quelle femme crois-tu [que Pierre a rencontré ___]?
 which woman believe-you *que* Pierre has met
 'Which woman do you believe that Pierre met?'
- b. Quelle femme crois-tu [qui ___ a rencontré Pierre]?
 which woman believe-you *qui* Pierre has met
 'Which woman do you believe met Pierre?'

If *qui* is in C, it might represent the form taken by T when it is the second element attracted by *uT* on C. In a certain sense, if this proposal and our speculation about accusative case are both correct, *qui* is the "accusative" form of *que*. Movement of the nominative subject to Spec,CP might be represented by constructions such as (ii):

- (ii) J'ai vu [Marie qui sortait du cinéma].
 I saw Mary *qui* left the movie theater
 'I saw Mary leaving the movie theater.'

Unexplained would be the fact that the bracketed phrase in (ii) is limited to the complement of perception verbs and existential verbs, and receives the "direct perceptual report" interpretation discussed by Higginbotham (1983) — unlike its counterpart in English, under this analysis.

A similar analysis might be accorded to West Flemish *die*, which alternates with *da* in a manner reminiscent of the *que/qui* alternation of French (Haegeman 1983; Rizzi 1990).

Standard and Belfast English would presumably have no second attraction of tense by *uT* on C, or second attraction that is covert in one of the senses discussed by Pesetsky (2000). The dialects of the American Midwest, discussed by Sobin (1987) might differ on precisely this point. They show no *that*-

trace effect (or at most a very weak effect). In these dialects, second attraction of tense by *uT* on C might be overt, as in French, but without the morphological reflex.

⁷⁴ The Earliness Principle precludes (90), which would otherwise constitute a third case under (92a).

⁷⁵ The Portuguese clause-type called the "inflected infinitive" might also have the character we attribute to DP, given Raposo's (1987) observation that these infinitival clauses — whose subjects may be nominative — need "case licensing" from outside. This suggests that the counterpart to TP in an inflected infinitive CP might not be TP, but some other category that leaves the *uT* feature of C unmarked for deletion.

⁷⁶ Szabolcsi's arguments concern parallels between the internal structure of DP and CP. Similar results are reached by Torrego (1985), who argued for a position in DP with the properties of Spec,CP.

⁷⁷ A question left open by our work is the *reason* for the obligatory presence of *uT* on instances of C and D. Were it not for the existence of realis infinitives whose C seems to lack *uT*, we might speculate that the presence of *uT* on CP and DP is related in some way to their ability to serve as arguments. Alternatively, we might ask whether the presence of *uT* on C reflects the status of C as an "extended projection" of T in the sense of Grimshaw (1991) (cf. Abney (1987)). The difficulty with this proposal is precisely the presence of *uT* on D, which does not take TP as its complement — but see note 17 for a possible avenue to pursue.

REFERENCES

- Abney, Steven. 1987. *The English noun phrase in its sentential aspect*. Doctoral dissertation, MIT.
- Alexiadou, Artemis, and Elena Anagnostopoulou. (1998), Parametrizing AGR: word Order, V-Movement and EPP-checking. *Natural Language & Linguistic Theory*. 16: 491-539.
- Anagnostopoulou, Elena. 1998. On clitics, feature movement and double object Alternations. *Proceedings of NELS 1998*. Graduate Student Linguistic Association, University of Massachusetts, Amherst.
- Anagnostopoulou, Elena. 1999. Ms., University of Crete.
- Baković, Eric. 1998. **Optimality and inversion in Spanish**. In. Pilar Barbosa, Danny Fox, Martha McGinnis, Paul Hagstrom and David Pesetsky (eds.). 1998. *Is the Best Good Enough?*, MIT Working Papers in Linguistics and MIT Press.
- Barbosa, Pilar. 1999. On Inversion in *Wh*-questions in Romance. Ms., Universidade do Minho, Portugal.
- Belletti, Adriana, and Luigi Rizzi. 1981. The syntax of *ne*: some theoretical implications. *The Linguistic Review*. 1:117-154.
- Benmamoun, Elabbas. 1992. *Functional and Inflectional Morphology: Problems of Projection, Representation, and Derivation*. Doctoral dissertation, University of Southern California.
- Benmamoun, Elabbas. to appear. *The feature structure of functional categories: a comparative study of Arabic dialects*. Oxford: Oxford University Press.
- Bhatt, Rajesh. 1999. *Covert modality in Non-finite contexts*. Doctoral dissertation, University of Pennsylvania.
- Bittner, Maria, and Ken Hale. 1996. The structural determination of case and agreement. *Linguistic Inquiry* 27:1-68.
- Bošković, Željko. 1995. On certain violations of the superiority condition, AgrO, and economy of derivation. *Journal of Linguistics* 33: 227-254.
- Boivin, Marie Claude. 1999a. Case feature checking and its consequences: evidence from *en*-cliticization in French. In J.-M. Authier, B. Bollock and L. Reed, eds. *Formal Perspectives on Romance Linguistics*. Amsterdam: John Benjamins.
- Boivin, Marie Claude. 1999b. *Split Noun Phrases and the theory of case*. Doctoral dissertation, MIT.
- Borer, Hagit. 1998. Deriving passive without theta roles. In *Morphology and its relations with Phonology and Syntax*, ed. Steven D. Lapointe, Diane Brentari and Patrick Farrell. Stanford: Center for the Study of Language and Information.
- Bresnan, Joan and Jonni Kanerva. 1989 Locative inversion in Chichewa: a case study of factorization in grammar", *Linguistic Inquiry* 20: 1-50..
- Bresnan, Joan. 1972. *Theory of complementation in English syntax*. Doctoral dissertation, MIT.
- Bresnan, Joan. 1977. Variables in the theory of transformations. In *Formal Syntax*, ed. Peter W. Culicover, Thomas Wasow and Adrian Akmajian. New York: Academic Press.
- Browning, M.A. 1996. CP recursion and *that*-t effects. *Linguistic Inquiry* 27, 237-256.
- Carstairs, Andrew. 1973. *For-to* complements and *if*-clauses. *Quarterly Progress Report* 109: 147-153. Cambridge, Mass.:MIT Research Laboratory of Electronics.
- Chomsky, Noam. 1957. *Syntactic Structures*. The Hague:Mouton.
- Chomsky, Noam. 1977a. *Essays on form and interpretation*. Amsterdam: Elsevier North-Holland.
- Chomsky, Noam. 1986. *Barriers*. Cambridge, Mass.: MIT Press.
- Chomsky, Noam. 1995. *The Minimalist Program*. MIT Press, Cambridge, Mass.
- Chomsky, Noam. 1977b. On *wh*-movement. in Culicover, Peter W., Thomas Wasow and Adrian Akmajian. eds. *Formal Syntax*. New York: Academic Press.
- Chomsky, Noam. 1980. On binding. *Linguistic Inquiry* 11:1-46.
- Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht, Netherlands: Foris. [reprinted: Dordrecht, Netherlands: Mouton de Gruyter]
- Chomsky, Noam. 1998. Minimalist inquiries: the framework. Cambridge, MA:MIT Occasional Papers in Linguistics.

- Chomsky, Noam. 1999. Derivation by phase. Cambridge, Mass.:MIT Occasional Papers in Linguistics.
- Chomsky, Noam, and Howard Lasnik. 1977. Filters and Control. *Linguistic Inquiry* 8: 425-504.
- Chung, Sandra, and James McCloskey. 1983. On the interpretation of certain island facts in GPSG. *Linguistic Inquiry* 14:704-713.
- Cinque, Guglielmo. 1999. Adverbs and functional heads. Oxford: Oxford University Press.
- Culicover, Peter. 1993. Evidence against ECP accounts of the *that-t* effect. *Linguistic Inquiry* 24, 557-561.
- Demirdache, Hamida. 1991. *Resumptive chains in restrictive relatives, appositives and dislocation structures*. Doctoral dissertation, MIT.
- Demirdache, Hamida. 1997. A cross-linguistic asymmetry in the temporal interpretation of DPs. In. *Proceedings of ESCOL '96*. Anthony Green and Virginia Motapanyane, eds. Ithaca, NY: Cornell Linguistics Circle.
- Den Besten, Hans. 1983. On the interaction of root transformations and lexical deletive rules. In *On the Formal Syntax of the Westgermania*, ed. Werner Abraham. Amsterdam: Benjamins. [written in 1978]
- Diesing, Molly. 1990. Verb movement and the subject position in Yiddish. *Natural Language and Linguistic Theory* 8: 41-80.
- Doherty, Cathal. 1993. Clauses without *that*: the case for bare sentential complementation in English. Doctoral dissertation, University of California, Santa Cruz.
- Elliott, Dale. 1971. *The grammar of emotive and exclamatory sentences in English*. Doctoral dissertation, Ohio State. [Reproduced in *Working Papers in Linguistics No. 8*. Ohio State University. Columbus, Ohio.]
- Emonds, Joseph. 1985. *A unified theory of syntactic categories*. Foris: Dordrecht.
- Emonds, Joseph. 1986. Grammatically deviant prestige constructions. In Brame, Michael, Heles Contreras and Frederick J. Newmeyer, eds. *A Festschrift for Sol Saporta*. Seattle: Noit Amrofer.
- Enç, Mürvet. 1981. Tense without scope: an analysis of nouns as indexicals. Doctoral dissertation, University of Wisconsin, Madison.
- Engdahl, Elisabet. 1985 Parasitic Gaps, Resumptive Pronouns and Subject Extractions. *Linguistics* 23:3-44.
- Epstein, Samuel D., Erich M. Groat, Ruriko Kawashima, and Hisatsugu Kitahara. 1998. *A derivational approach to syntactic relations*, Oxford University Press.
- Fox, Danny. 1994 Relative Clauses and Resumptive Pronouns in Hebrew - An Optimality Theoretic Approach. Ms., MIT. Cambridge, Mass: MIT.
- Gazdar, Gerald. 1981. Unbounded dependencies and coordinate structure. *Linguistic Inquiry* 12: 155-184.
- George, Leland, and Jaklin Kornfilt. 1981. Finiteness and boundedness in Turkish. In. *Binding and Filtering*, ed. Frank Heny. Cambridge Mass.: MIT Press.
- Ginzburg, Jonathan, and Ivan A. Sag. to appear. English Interrogative Constructions. Stanford: CSLI Publications.
- Goldberg, Adele. 1995. *Constructions: a construction grammar approach to argument structure*. Chicago: University of Chicago Press.
- Grimshaw, Jane. 1997 Projection, heads, and optimality. *Linguistic Inquiry* 28, 373-422.
- Grimshaw, Jane. 1979. Complement selection and the lexicon. *Linguistic Inquiry* 10:279-326.**
- Grimshaw, Jane. 1991. Extended projection. Ms., Brandeis University.
- Guéron, Jacqueline, and Teun Hoekstra. 1988. T-chains and the constituent structure of auxiliaries. In. *Annali di Cà Foscari - Constituent Structure: Papers from the 1987 Glow Conference*. Venice: Editoriale Programma.
- Hackl, Martin, and Jon Nissenbaum. Forthcoming. Toward a semantics of *for*-infinitivals. In *Proceedings of the Bergamo Conference on the Syntax and Semantics of Tense and Mood Selection*. Alessandra Giorgi, James Higginbotham and Fabio Pianesi (eds.), Oxford: Oxford University Press.
- Haeberli, Eric. 1999. *Features, Categories and the Syntax of A-positions: Synchronic and Diachronic Variation in the Germanic Languages*. Thèse de doctorat, University of Geneva.

- Haegeman, Liliane. 1983. *Die* and *dat* in West-Flemish relative clauses. In: *Linguistics in the Netherlands*, Hans Bennis and W.U.S. van Lessen-Kloeke, eds. Dordrecht: Foris.
- Hale, Ken, and S.J. Keyser. 1993. On argument structure and the lexical expression of syntactic relations. In *The view from Building 20*, ed. Ken Hale and S.J. Keyser. Cambridge, Mass.: MIT Press.
- Hale, Ken. 1998a. On endangered languages and the importance of linguistic diversity. In Grenoble, Lenore A., and Lindsay J. Whaley. Eds. *Endangered Languages: Language Loss and Community Response*. Cambridge: Cambridge University Press. Pp. 192-216.
- Hale, Ken. 1998b. A note on the Pittapitta nominative case and the future tense. unpublished manuscript, Massachusetts Institute of Technology.
- Henry, Alison. 1995. *Belfast English and Standard English*. Oxford University Press.
- Higginbotham, James. 1983. The logic of perceptual reports: an extensional alternative to situation semantics. *Journal of Philosophy*. 80:100-127.
- Huang, C.T. James. 1982. *Logical relations in Chinese and the theory of grammar*. Doctoral dissertation.
- Iatridou, Sabine and David Embick. *Apropos pro*. *Language* 73:58-78.
- Iatridou, Sabine. 1991. *Topics in Conditionals*. Doctoral dissertation, MIT.
- Jaeggli, Osvaldo. 1982. *Topics in Romance Syntax*. Dordrecht: Foris.
- Jaeggli, Osvaldo. 1984. Subject extraction and the null subject parameter. *Proceedings of NELS 14*. Graduate Linguistics Students Association, University of Massachusetts, Amherst.
- Jakobson, Roman. 1936/1984. Beitrag zur allgemeinen Kasuslehre. Translated as: General meanings of the Russian cases. In: *Russian and Slavic Grammar: Studies 1931-1981*. Berlin: Mouton de Gruyter.
- Kayne, Richard S. 1977. French Relative *Que*. In *Current Studies in Romance Linguistics*, ed. Marta Luján and Fritz Hensey. Washington D.C.: Georgetown University Press.
- Kayne, Richard S. 1975. A partial history of the relative clause in English. In: *Papers in the history and structure of English: University of Massachusetts Occasional Papers in Linguistics 1*, Jane Grimshaw, ed. Graduate Student Linguistics Association, University of Massachusetts, Amherst.
- Kayne, Richard S. 1980a. Extensions of binding and case-Marking. *Linguistic Inquiry*. 11:75-96. [Reprinted in Kayne (1984).]
- Kayne, Richard S. 1980b. ECP extensions. *Linguistic Inquiry* 12:93-133. [Reprinted in Kayne (1984).]
- Kayne, Richard S. 1981. Two notes on the NIC. In: *Theory of Markedness in Generative Grammar: Proceedings of the 1979 GLOW Conference*, Scuola Normale di Pisa. [Reprinted in Kayne (1984).]
- Kayne, Richard S. 1984. *Connectedness and Binary Branching*, Foris, Dordrecht.
- Kayne, Richard S. 1991. Romance clitics, verb movement, and PRO. *Linguistic Inquiry* 22:647-686.
- Kayne, Richard S. 1993. Toward a modular theory of auxiliary selection. *Studia Linguistica* 47:3-31.
- Kayne, Richard S. 1994. *The antisymmetry of syntax*. Cambridge, Mass.: MIT Press.
- Kayne, Richard S., and Jean-Yves Pollock. 1978. Stylistic inversion, successive cyclicity, and Move NP in French. *Linguistic Inquiry*. 9:595-621.
- Kayne, Richard S. and Jean-Yves Pollock. 1999. New thoughts on stylistic inversion. Unpublished ms. New York University and UPR-9075 CNRS Lyons, France.
- Keyser, Samuel Jay. 1975. A partial history of the relative clause in English. In *Papers in the History and Structure of English*, ed. Jane Grimshaw. University of Massachusetts Occasional Papers in Linguistics, Dept. of Linguistics, Amherst, Mass.
- Kitagawa, Yoshihisa. 1986. *Subjects in Japanese and English*. Doctoral dissertation, University of Massachusetts, Amherst..
- Kjellmer, Göran. 1975. Are relative infinitives modal? *Studia Neophilologica* 47:323-332.
- Koizumi, Masatoshi. 1995. *Phrase structure in minimalist syntax*, unpublished Doctoral dissertation, MIT. [available from MIT Working Papers in Linguistics, mitwpl@mit.edu]
- Koopman, Hilda. 1983. ECP effects in main clauses. *Linguistic Inquiry* 14: 346-350.
- Koopman, Hilda and Dominique Sportiche. 1991. The position of subjects. *Lingua*, 85, 211-258.

- Koster, Jan. 1978b. Why subject sentences don't exist. In Keyser, S.J. Ed. *Recent Transformational Studies in European Languages*. Cambridge, MA: MIT Press.
- Koster, Jan. 1978a. *Locality Principles in Syntax*. Dordrecht: Foris Publications.
- Kuno, Susumu and Jane J. Robinson. 1972. Multiple WH-Questions. *Linguistic Inquiry* 3: 463-487.
- Kuroda, Shige-Yuki 1988. Whether we agree or not: A comparative syntax of Japanese and English. In *Papers from the second international workshop on Japanese syntax*, William Poser, ed. Stanford, CA: CSLI Publications. Distributed by Chicago University Press.
- Laka, Itziar. 1990. Negation in syntax: on the nature of functional categories and projections. Doctoral dissertation, MIT.
- Larson, Richard 1985. On the Syntax of Disjunction. *Natural Language and Linguistic Theory* 3: 217-264.
- Lasnik, Howard and Mamoru Saito. 1984. On The Nature of Proper Government. *Linguistic Inquiry* 15: 235-290.
- Lasnik, Howard and Mamoru Saito. 1992. *Move α : conditions on its application and output*. Cambridge, MA: MIT Press.
- Lecarme, Jacqueline. 1997. Nominal tense and tense theory. In. *Empirical issues in Formal Syntax and Semantics 2: Selected papers from the Colloque de Syntaxe et Semantique, Paris (CSSP)*. Francis Corblin, Carmen Dobrovie-Sorin, Jean-Marie Marandin, eds. The Hague: Holland Academic Graphics.
- Marantz, Alec 1991. Case vs. Licensing. In. *Proceedings of ESCOL '91*, German Westphal, Benjamin Ao, and Hee-Rahk Chae, eds. Ithaca, NY: Cornell Linguistics Circle.
- McCawley, Noriko Akatsuka. 1973. Boy! Is syntax easy!. *Papers from the ninth regional meeting: Chicago Linguistic Society*, Claudia Corum, T. Cedric Smith-Stark and Ann Weiser, eds. Department of Linguistics, University of Chicago.
- McCloskey, James. 1991. *There, it, and agreement*. *Linguistic Inquiry* 22. 563-567.
- McDaniel, Dana. 1989. Partial and multiple Wh-movement. *Natural Language and Linguistic Theory* 7. 565-604.
- Mulder, René, and Rint Sybesma. 1992. Chinese is a VO language. *Natural Language and Linguistic Theory*. 10:439-476.
- Musan, Renate. 1995. On the temporal interpretation of noun phrases. Doctoral dissertation, MIT. [Reprinted by Garland Publishers, 1997.]
- Nakajima, Heizo. 1996. Complementizer selection. *The Linguistic Review*. 13: 143-164.
- Newmeyer, Frederick J. 1998. *Language Form and Language Function*. Cambridge, MA: MIT Press.
- Nissenbaum, Jonathan. In prep. Doctoral dissertation, MIT.
- Ordoñez, Francisco. 1997. Word order and clause structure in Spanish and other Romance languages. Doctoral dissertation, City University of New York.
- Perlmutter, David. 1971. *Deep and surface structure constraints in syntax*. New York: Holt, Rinehart and Winston.
- Pesetsky, David. 1982b. *Paths and Categories*. Doctoral dissertation, MIT.
- Pesetsky, David. 1989. The earliness principle. Ms., MIT [available at: <http://web.mit.edu/linguistics/www/pesetsky/earliness.pdf>]
- Pesetsky, David. 1982a. Complementizer-trace phenomena and the Nominative Island Condition. *The Linguistic Review*. 1:297-344.
- Pesetsky, David. 1987. Wh-in-situ: Movement and Unselective Binding. E. Reuland and A. ter Meulen, eds., *The Representation of (In)definiteness*, 98-129. Cambridge, MA: MIT Press
- Pesetsky, David. 1991. unpub. chapters of *Zero Syntax* [available at <http://web.mit.edu/linguistics/www/pesetsky/infins.pdf>]
- Pesetsky, David. 1998. Some Optimality Principles of Sentence Pronunciation. in Barbosa et al. (1998). Pilar Barbosa, Danny Fox, Martha McGinnis, Paul Hagstrom and David Pesetsky (eds.). 1998. *Is the Best Good Enough?* MIT Working Papers in Linguistics and MIT Press.
- Pesetsky, David. 2000. *Phrasal movement and its kin*. Cambridge, Mass.:MIT Press.

- Picallo, M. Carme. 1984. The Infl node and the null subject parameter. *Linguistic Inquiry* 15:75-102.
- Piera, Carlos. 1979 Some Subject Sentences. *Linguistic Inquiry* 10. 732-734.
- Platzack, Christer. to appear. Multiple interfaces. In. *Conceptual Structure and its Interfaces with Other Modules of Representation*. Urpo Nikanne and Emile van der Zee, eds. Oxford, UK: Oxford University Press.
- Platzack, Christer. 1998. A visibility condition for the C-domain. *Working Papers in Scandinavian Syntax*. 61, 53-99.
- Pollock, Jean-Yves. 1986. Sur la syntaxe de *en* et le paramètre du sujet nul. In. Mitsou Ronat and Daniel Couquaux, eds. *La grammaire modulaire*. Paris: Editions de Minuit.
- Pollock, Jean-Yves. 1989. Verb movement, Universal Grammar, and the structure of IP. *Linguistic Inquiry* 20:365-424.
- Raposo, Eduardo. 1987. Case theory and Infl-to-Comp: the inflected infinitive in European Portuguese. *Linguistic Inquiry* 18:85-109.
- Raposo, Eduardo, and Juan Uriagereka. 1990. Long-distance case assignment. *Linguistic Inquiry* 21:505-538.
- Richards, Norvin. 1997 *What Moves Where in Which Language?* Doctoral dissertation, MIT, Cambridge, Mass.
- Richards, Norvin. 1998. The Principle of Minimal Compliance. *Linguistic Inquiry* 29, 599-629.
- Ritter, Elisabeth, and Anna Szabolcsi. 1985. Let's take the *that*-trace effect seriously. Ms., MIT.
- Rizzi, Luigi. 1982. *Issues in Italian Syntax*. Dordrecht: Foris.
- Rizzi, Luigi. 1990. *Relativized Minimality*. Cambridge, MA: MIT Press.
- Rizzi, Luigi. 1996. Residual verb second and the *wh*-criterion. In Belletti, Adriana and Luigi Rizzi. Eds. *Parameters and functional heads: essays in comparative syntax*. Oxford: Oxford University Press.
- Rizzi, Luigi. 1997. The fine structure of the left periphery. In Haegeman, Liliane. Ed. *Elements of Grammar. Handbook of Generative Syntax*. Kluwer: Dordrecht, 281-337.
- Ross, John R. 1967. *Constraints on variables in syntax*. Doctoral dissertation, MIT.
- Rouveret, Alain, and Jean-Roger Vergnaud. 1980. Specifying reference to the subject: French causatives and conditions on representations. *Linguistic Inquiry* 11:97-202.
- Rudin, Catherine. 1988. On multiple questions and multiple WH fronting. *Natural Language and Linguistic Theory*. 6: 445-502.
- Schütze, Carson. 1997. *INFL in child and adult language: Agreement, case and licensing*. Doctoral dissertation, MIT.
- Sobin, Nicholas. 1987. The variable status of Comp-trace phenomena. *Natural Language and Linguistic Theory* 5: 33-60.
- Stowell, Tim. 1981. *Origins of Phrase Structures*. Unpublished doctoral dissertation. Cambridge, MA: Massachusetts Institute of Technology.
- Stowell, Tim. 1982. The tense of infinitives. *Linguistic Inquiry* 13. 561-570.
- Suñer, Margarita. 1994. Verb movement and the licensing of argumental *wh*-phrases in Spanish. *Natural Language and Linguistic Theory*. 12: 335-372.
- Szabolcsi, Anna. 1983. The possessor that ran away from home. *The Linguistic Review*. 3:89-102.
- Szabolcsi, Anna. 1987. Functional categories in the noun phrase. In Kenesei István. Ed. *Approaches to Hungarian Volume 2: Theories and Analyses*. Szeged: Jate Szeged.
- Taraldsen, Knut Tarald. 1979. On the NIC, vacuous application and the *that*-trace filter. Bloomington, Indiana: Indiana University Linguistics Club.
- Torrego, Esther. 1983/1986. Experiencers and raising verbs. In. *Current issues in comparative grammar*, Robert Freidin, ed. Dordrecht: Kluwer.
- Torrego, Esther. 1983. More effects of successive cyclic movement. *Linguistic Inquiry* 14, 561-565.
- Torrego, Esther. 1984. On inversion in Spanish and some of its effects. *Linguistic Inquiry* 15, 103-130.
- Torrego, Esther. 1985. On empty categories in nominals. Ms., University of Massachusetts, Boston.
- Travis, Lisa. 1984. *Parameters and effects of word order variation*. Doctoral dissertation, MIT, Cambridge, Mass.

Uriagereka, Juan. 1999. Minimal restrictions on Basque movements. *Natural Language and Linguistic Theory* 17:403-444.