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A Mechanism of PF-Deletion Under the Probe–Goal System

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Abstract

This paper develops a mechanism of PF-deletion within a probe–goal system that incorporates C-to-T feature inheritance. I propose that the phase head C enters the derivation not only with an edge feature (EF) and agree (φ-)features but also with a delete-feature, which licenses the deletion of an element at PF (PF-deletion). When C-to-T feature inheritance applies, the target of PF-deletion is determined through φ-probing from T; when it does not, it is determined through EF-probing from C. By linking PF-deletion to phase-internal probing, this approach dispenses with *pro*, traditionally assumed to exist in the lexicon of null subject languages such as Italian, as a theoretical primitive. Crucially, it offers a unified account of the distribution of null arguments in both Italian (a *pro*-drop language) and German (a topic-drop language), two language types that have traditionally resisted unified analysis under the principles-and-parameters approach. In addition to the synchronic study of the distribution of null arguments, I further argue that diachronic evidence from old languages such as Old French and Old English lends additional support to the proposal, and conclude that whether C-to-T inheritance applies or not is a crucial factor in explaining crosslinguistic variation in null argument phenomena.

Keywords: C-to-T feature inheritance; probe–goal system; *φ*-probing; EF-probing; delete-feature; PF-deletion; distribution of null arguments; *pro*-drop language; topic-drop language; old languages

1. Introduction

The ungrammaticality of sentences like (1) is typically attributed to a violation of the Extended Projection Principle (EPP), which stipulates that every clause must have a subject—specifically, that the specifier position of the Tense Phrase (Spec-TP) must be filled.

(1) *(She) speakes German

Under the VP-internal subject hypothesis, which has long been assumed within the Minimalist Program (MP), the EPP in (1) is satisfied as illustrated in (2): the subject *she* is first generated in Spec-*v**P as the external argument of the verb *speak*, and then moves to Spec-TP to satisfy the EPP.

(2) $[_{TP}\ She_i\ [T_{[EPP]}\ [_{v^*P}\ t_i$ speaks German]]]

Given that the EPP is assumed to be a part of Universal Grammar (UG), an immediate question arises: why are null subject constructions permitted in certain languages? This is illustrated by the Italian example in (3), where [e] represents an empty subject corresponding to a third-person feminine pronoun such as *ella* 'she'.

Check for updates

Academic Editor: Jason Kandybowicz

Received: 2 September 2025
Revised: 22 January 2026
Accepted: 25 January 2026
Published: 31 January 2026

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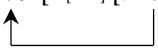
(3) *Italian*

[e]	parla	tedesco.
	speaks	German

'She speaks German.'

To account for this crosslinguistic variation, it has long been assumed, since Chomsky (1982), that the lexicon of null subject languages such as Italian includes a phonetically null pronominal element, *pro*, which occupies Spec-TP in order to satisfy the EPP.

(4) [TP *pro*$_i$ [T$_{[EPP]}$ [v^*P t_i parla tedesco]]]



However, whether a phonetically null element can indeed fulfill the EPP requirement remains a matter of debate. Takahashi (2001), based on the ungrammaticality of examples like (5), argues that the EPP must be satisfied by an overt element rather than a null element.

(5) a. *John is easy to expect _ will see Mary.
b. *?John is easy to believe _ to know Mary well.

Given that *easy-to*-type constructions involve empty operator movement within the *to*-infinitival clause (Stowell, 1986), Takahashi argues that the ungrammaticality of these sentences results from a violation of the EPP: since the operator that moves to Spec-TP is phonologically null, it cannot satisfy the EPP.[1]

Abe (2015) strengthens this claim with evidence from parasitic gap constructions, which show a similar pattern of ungrammaticality when a null operator occupies subject position.

(6) a. *someone who$_i$ John expected t_i would be successful though believing that e_i is incompetent.
b. *?someone who$_i$ John expected t_i would be successful though believing e_i is incomepetent. (Chomsky, 1982, p. 53)

Although (6a) might be explained by the *that*-trace effect, the persistence of ungrammaticality in (6b)—despite the absence of *that*—suggests a more fundamental issue. Abe adopts Chomsky's (1986) empty operator movement analysis and argues that these structures are ruled out because the null operator in the subject position of the parasitic clause cannot satisfy the EPP. Thus, these data cast doubt on the traditional assumption that a phonetically null element can occupy Spec-TP to satisfy the EPP.

I therefore depart from the standard analysis exemplified in (4). Instead, in this paper, I argue that *pro* can be eliminated from the grammar, proposing that apparent null subjects arise as the result of PF-deletion applied to fully specified overt pronouns, as illustrated in (7) (the deleted material is indicated by strikethrough, and how the EPP is satisfied under this analysis will be discussed in detail below).

(7) ~~Ella~~ parla tedesco.

This proposal offers several theoretical advantages over the traditional *pro*-based account. First, it dispenses with the need to posit *pro* as a primitive lexical item—an abstract, null pronominal bearing φ- and case-features but lacking phonological content (see Holmberg, 2005, for relevant discussion). If null subjects are derived via PF-deletion, such stipulations become unnecessary, thereby enhancing theoretical economy, a central goal of the MP. Second, this approach shifts parametric variation from the lexicon to narrow syntax and the interfaces, allowing crosslinguistic differences in null argument distribution to be captured by independently motivated mechanisms rather than stipulative parameter settings. In fact, as will be demonstrated below, it enables a unified analysis

https://doi.org/10.3390/languages11020028

of null arguments in both Italian—a prototypical *pro*-drop language—and German—a representative topic-drop language. These language types have long resisted a unified account within the principles-and-parameters framework, which has at best provided a descriptive classification based on [±*pro*, ±topic] parameter values (e.g., Italian: [+*pro*, −topic]; German: [−*pro*, +topic]; English: [−*pro*, −topic]) without offering a principled theoretical explanation (see Chomsky, 1981; Huang, 1984).

Against this background, the present study aims to uncover the precise mechanism underlying PF-deletion and to derive null arguments on that basis. The paper is organized as follows. Section 2 outlines the probe–goal system with C-to-T feature inheritance adopted here. It begins by reviewing Chomsky's (2008) proposal that all operations at the C-T level are driven by the phase head C, followed by Richards' (2007) theoretical rationale for feature inheritance. It then introduces Goto's (2011) argument concerning the applicability of feature inheritance, which follows naturally from Richards' proposal and plays a key role in explaining crosslinguistic variation in null argument phenomena. In particular, Goto argues that C-to-T inheritance does not apply in so-called V2 environments, such as matrix clauses that involve T-to-C head movement. Section 3 develops a PF-deletion mechanism based on this system. It is proposed that the phase head C may enter the derivation not only with an edge feature (EF) and an agree (φ-)feature, but also with a delete-feature that licenses PF-deletion. This system predicts that in V2 environments such as matrix clauses, where feature inheritance does not apply, the delete-feature is assigned via EF-probing from C. In contrast, in non-V2 environments such as embedded clauses, where inheritance applies, it is assigned via φ-probing from T. This account captures the observed distribution of null arguments in Italian and German in a unified manner, and it also provides a natural explanation for the more complex null argument phenomena found in older languages such as Old French and Old English. Section 4 explores the theoretical implications of the proposal and concludes the paper.[2]

2. A Probe–Goal System That Incorporates C-to-T Feature Inheritance

2.1. Chomsky (2008)

Drawing on the fact that T in raising and exceptional case marking (ECM) constructions—where T is not selected by C—lacks φ- and tense-features, Chomsky (2008) proposes that these features are not inherent to T but instead originate from C. He argues that subject agreement and EPP effects associated with T arise via a mechanism of *feature inheritance*. To illustrate this point, consider the derivation of the sentence in (8) (where I abstract away from a tense feature, as it plays no role in the relevant derivation).

(8) She speakes German.

a. [$C_{[\varphi]}$ [T [v^*P she speak German]]]

b. [C [$T_{[\varphi]}$ [v^*P she speak German]]]

c. [C [$T_{[\varphi]}$ [v^*P she speak German]]]

d. [C [TP she_i [$T_{[\varphi]}$ [v^*P t_i speak German]]]]

In (8a), T is selected by C bearing φ-features. In (8b), φ-features are inherited by T from C. In (8c), T, now equipped with φ-features, probes the subject *she* and establishes a probe–goal (agree) relation, thereby valuing the uninterpretable φ-features on T and the uninterpretable case feature ([uCase]) on *she* (see Chomsky, 2000, 2001). Finally, in (8d), *she* moves to Spec-TP to satisfy the EPP, undergoing what is commonly referred to as A-movement.

https://doi.org/10.3390/languages11020028

Chomsky (2008), referring to the feature that enables an element to be merged as an edge feature (EF), argues that A′-movement involves EF-probing by C. In particular, he explicitly assumes EF-driven probing in *wh*-movement (Chomsky, 2008, pp. 147, 151). This claim is motivated by theoretical considerations regarding the architecture of *wh*-movement. In earlier works (e.g., Chomsky, 2000), uninterpretable features such as [*u*Wh] on a *wh*-phrase or [*u*Q] on C were assumed to drive A′-movement. However, Chomsky (2008) proposes eliminating such uninterpretable features from the A′-system entirely. As a result, there is no need to postulate a movement-driving uninterpretable feature, thereby avoiding the long-standing problem of crash at lower phase levels in successive-cyclic movement. To illustrate the problem in the earlier system, consider successive-cyclic *wh*-movement in Chomsky (2000). A *wh*-phrase with uninterpretable [*u*Wh] and interpretable [Q] must escape the transfer domains VP and TP by successively stopping in the edge positions of *v**P and CP, eventually entering an agree relation with a C head bearing uninterpretable [*u*Q] and interpretable [Wh]. Here, transfer refers to the operation that sends a syntactic object to the interfaces. If, however, a C head lacking such features intervenes along the derivational path, the *wh*-phrase would necessarily leave its [*u*Wh] feature unchecked in the transfer domain for that phase, which—contrary to fact—would cause the derivation to crash before convergence. The EF-based approach thus dispenses with this unnecessary theoretical complication and derives successive-cyclic A′-movement from independently required properties of phase theory.

With respect to minimality in probing, φ-probing and EF-probing are assumed to behave differently. Specifically, φ-probing, which involves feature valuation, is subject to intervention effects (Chomsky, 2008, p. 148), whereas EF-probing, which involves no valuation, is not (Chomsky, 2008, pp. 142, 151). This asymmetry follows naturally from the assumption that intervention effects arise only in the course of valuing uninterpretable features (Chomsky, 2000, p. 123).

The feature-inheritance-based probe–goal system has a significant consequence for the derivation of *wh*-subjects. Under this system, both the A′-movement of the *wh*-subject to Spec-CP and A-movement to Spec-TP apply in parallel from their base position in Spec-*v**P, triggered by the introduction of C and the inheritance by T. As a result, there is no movement from Spec-TP to Spec-CP. The derivation in (9) illustrates this point.

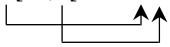
(9) Who speakes German?

a. [$C_{[EF][[\varphi]}$ [T [v^*P who speak German]]]

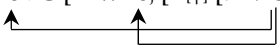
b. [$C_{[EF]}$ [$T_{[\varphi]}$ [v^*P who speak German]]]



c. [$C_{[EF]}$ [$T_{[\varphi]}$ [v^*P who speak German]]]



d. [$_{CP}$ who_k C [$_{TP}$ who_j [$T_{[\varphi]}$ [v^*P t_i speak German]]]]



In (9a), T is selected by C, which bears both an EF and φ-features. In (9b), φ-features are inherited by T from C. In (9c), φ-probing by T and EF-probing by C apply in parallel to *who* in Spec-*v**P. Finally, in (9d), *who* undergoes both A-movement to Spec-TP and A′-movement to Spec-CP directly from Spec-*v**P. This parallel derivation permits the direct formation of an operator–variable chain (who_k, t_i), which can be regarded as a desirable consequence for chain formation under the principle of Full Interpretation, as thoroughly discussed in Chomsky (2008, p. 149).

2.2. *Richards (2007)*

Richards (2007) argues that the mechanism of C-to-T feature inheritance is indispensable for reconciling two independently motivated premises. The first premise holds that φ-feature valuation and transfer must occur simultaneously.[3] The second premise, based on Chomsky (2000, p. 108) and Chomsky (2001, p. 13), maintains that the edge and non-edge domains of C—namely, TP—are transferred separately.

To illustrate this point, let us consider the relevant portion of the derivation in (8d) under two conditions, shown in (10) and (11), respectively (for expository convenience, the interpretable φ-features of *she* are included, and transfer is indicated by shading).

(10) No C-to-T feature inheritance
$[C_{[\varphi]}\ [_{TP}\ she_{[\varphi]}\ [T\ [_{v^*P}\ \ldots]]]]$
*φ-valuation

(11) C-to-T feature inheritance
$[C\ [_{TP}\ she_{[\varphi]}\ [T_{[\varphi]}\ [_{v^*P}\ \ldots]]]]$
φ-valuation

(10) illustrates a derivation without C-to-T feature inheritance, while (11) presents one in which feature inheritance from C to T occurs. In both cases, TP is transferred in accordance with the second premise. Crucially, when feature inheritance does not take place, as in (10), the derivation violates the first premise, which requires φ-feature valuation and transfer to occur simultaneously. In contrast, when feature inheritance does occur, as in (11), the derivation proceeds without violating either premise: by transmitting φ-features from C to T, as in (11), the system allows both the valuation and transfer of φ-features—on C and on *she*—to take place within the same domain, TP. Thus, Richards argues that C-to-T feature inheritance is indispensable for satisfying both premises simultaneously.

2.3. *Goto (2011)*

Noting that Richards' (2007) argument for C-to-T feature inheritance presupposes that CP and TP are transferred separately, Goto (2011) observes that the mechanism becomes redundant when CP and TP are transferred as a single unit. As schematically illustrated in (12), even in the absence of feature inheritance, the requirement that φ-feature valuation and transfer take place simultaneously can still be satisfied under such a unified transfer.

(12) No C-to-T feature inheritance
$[C_{[\varphi]}\ [_{TP}\ DP_{[\varphi]}\ [T\ [_{v^*P}\ \ldots]]]]$
φ-valuation

The question, then, is in what kinds of environments CP and TP are transferred simultaneously. Drawing on Chomsky's (2004, p. 108) suggestion that "[A]pplied to a phase PH, S-O [Spell-Out] must be able to spell out PH in full, or root clauses would never be spelled out," Goto argues that in contexts such as German root declarative sentences like (13), CP and TP must be transferred as a single unit (note that S-O and transfer are used interchangeably in this context). Otherwise, elements at the edge of CP—*der Mann hat*—would fail to be transferred to the interfaces, violating the principle of Full Interpretation.

(13) *German*

[$_{CP}$	*der Mann*	*hat(C)*	[$_{TP}$	den	Hund	gesehen]]
	the man	has		the	dog	seen

'The man has seen the dog.'

It should be noted that in German main clauses, the finite verb must obligatorily appear in the second position. Accordingly, in (13), *hat* is standardly assumed to occupy the C position, with *der Mann* occupying Spec-CP.

By contrast, note that the situation is different in embedded clauses. Unlike root clauses, an embedded C is selected by a higher head. Consequently, according to standard Phase Theory (Chomsky, 2000, et seq.), the complement of the phase head (i.e., TP) undergoes transfer separately from the phase edge (i.e., CP). Given Richards' (2007) argument that unvalued features on T must be valued before TP is transferred, C-to-T feature inheritance becomes obligatory in these contexts to ensure that φ-feature valuation and transfer occur simultaneously. Crucially, this requirement holds even if the embedded clause exhibits V2 surface word order. While the verb may move to C in embedded V2 clauses, the structural fact that the clause is embedded dictates that TP is transferred separately, thereby necessitating feature inheritance.

Building on these theoretical and empirical observations, Goto (2011) proposes (14) as a general condition on the applicability of C-to-T feature inheritance.[4]

(14) C-to-T feature inheritance is unnecessary in root V2 environments.

In fact, since *hat* in (13) morphologically realizes both tense and φ-features on C, it is more economical not to apply C-to-T feature inheritance in deriving this structure. If such structures were to be derived via feature inheritance, it would be necessary first to transmit the relevant features to T from C and then, by some additional mechanism such as T-to-C head movement, have them realized back on C. However, if inheritance does not apply in these environments—as the empirical facts directly suggest—such additional operations become superfluous.[5]

3. Proposal and Predictions

Adopting the probe–goal system with C-to-T feature inheritance reviewed in Section 2, I make the following three proposals. First, I propose that, in addition to the EF and φ-features, the phase head C can enter the derivation bearing what I term a delete feature, which licenses the PF-deletion of a syntactic element.[6]

(15) $C_{[EF][\varphi][Delete]} \ldots T$

Second, I propose that an element carrying a delete feature may be deleted at PF, provided that the condition of recoverability of deletion is satisfied. Third, I propose that the assignment of the delete feature is implemented via probing—either by φ-probing from T or EF-probing from C.

Crucially, this PF-deletion mechanism, when combined with the generalization in (14), yields the prediction that while the delete feature is inherited from C to T along with the φ-features in non-V2 languages such as Italian, it remains on C and is not inherited in V2 languages such as German.

(16) $C \ldots T_{[\varphi][Delete]}$ (in a non-V2 environment)

(17) $C_{[EF][Delete]} \ldots T$ (in a V2 environment)

In (16), delete-feature assignment is carried out via φ-probing from T, whereas in (17), it is carried out via EF-probing from C. Thus, it is predicted that the distribution of null arguments in Italian is regulated by the behavior of φ-probing, which is subject to

intervention effects, whereas in German it is determined by the behavior of EF-probing, which is not. The following subsections demonstrate that these predictions are indeed borne out.[7]

3.1. Deriving Null Arguments in Italian

Let us first examine how the present PF-deletion mechanism accounts for the null subject phenomenon illustrated in (3). Under the current system, the derivation of (3) proceeds as follows.

(18) [e] parla tedesco.

a. [$C_{[\varphi][Delete]}$ [T [v^*P ella parla tedesco]]]

b. [C [$T_{[\varphi][Delete]}$ [v^*P ella parla tedesco]]]

c. [C [$T_{[\varphi][Delete]}$ [v^*P ella parla tedesco]]]

d. [C [$T_{[\varphi]}$ [v^*P ~~ella~~$_{[Delete]}$ parla tedesco]]]

At the initial stage (18a), the phase head C is introduced bearing both φ- and delete-features. These features are then inherited by T, as shown in (18b). In (18c), the φ-feature on T probes the subject *ella*, establishing a probe–goal relation within its minimal search space. This agree relation leads not only to the valuation of φ- and case-features on both T and *ella*, but also to the assignment of the delete-feature to the agreeing subject. As shown in (18d), the subject *ella* is then deleted at PF, provided that the condition of recoverability is met. Crucially, this analysis derives the null subject without postulating *pro* as a primitive lexical item—an abstract null pronominal introduced solely to account for subjectless sentences. Instead, null subjects are derived through independently motivated operations such as φ-probing and PF-deletion.

At this point, one might wonder how the EPP requirement is satisfied in the derivation of (18d), where no overt element appears to occupy Spec-TP. This concern, however, is resolved if we adopt the mechanism of EPP satisfaction proposed by Goto (2017), which builds on the approach developed by Alexiadou and Anagnostopoulou (1998; henceforth A&A). According to A&A, in null subject languages such as Italian, the EPP can be satisfied through verb movement to T, provided that T bears rich agreement morphology. Building on this view, Goto argues that the EPP can be satisfied via verb movement to Spec-TP. It is therefore plausible to assume that this strategy is employed in the derivation of (18d), as illustrated below.

(19) [C [$_{TP}$ parla $T_{[EPP]}$ [v^*P ~~ella~~$_{[Delete]}$ t_{parla} tedesco]]]

In (19), the raising of *parla* to Spec-TP satisfies the EPP requirement, rendering the sentence grammatical despite the absence of an overt subject.[8]

Importantly, if non-null subject languages such as English lack this V-raising strategy for EPP satisfaction—as A&A and Goto argue—the ungrammaticality of the sentence in (1) can be attributed to a failure to satisfy the EPP. Specifically, under the present system, English T can in principle assign the delete feature to the agreeing subject, just as in Italian, as illustrated in (20a–b).

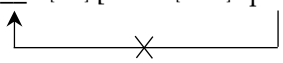
(20) *(She) speaks German.

a. [C [$T_{[\varphi][Delete]}$ [v^*P she speakes German]]]

b. [C [$T_{[\varphi]}$ [v^*P ~~she~~$_{[Delete]}$ speaks German]]]

However, if this option is taken, the derivation crashes due to a violation of the EPP. As shown in (21), without verb movement to T, the deletion of the subject leaves the EPP unsatisfied, resulting in ungrammaticality.

(21) [C [$_{TP}$ __ $T_{[EPP]}$ [$_{v^*P}$ ~~she~~$_{[Delete]}$ speaks German]]]



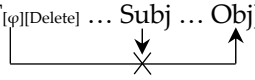
Thus, under the current system, the contrast between Italian and English with respect to the availability of null subjects is attributed to the presence or absence of the V-raising strategy for EPP satisfaction, as originally proposed by A&A and further elaborated by Goto.

Remarkably, the present probe–goal (agree) analysis of null subjects offers a natural explanation for the general unavailability of null objects in Italian. Consider the following example.[9]

(22)	a.	*Mario	ha	costretto	[e]	a partire.	
		Mario	has.3SG	forced	(me/her/…)	to leave	
	b.	*Gianni	sa	che Maria	[e]	vide.	
		Gianni	knows.3SG	that Maria	(him)	saw	(Rizzi, 1986, p. 517)

Under the current system, the ungrammaticality of (22a–b), which lacks an overt object, can be attributed to intervention effects. As shown in (23), since φ-probing from T is subject to minimal search, the delete feature cannot be assigned to the lower object across the intervening subject. As a result, the object cannot undergo PF-deletion and must be overtly realized.

(23) [C [$T_{[\varphi][Delete]}$ … Subj … Obj]]



In this way, the current analysis offers a unified explanation of null argument phenomena in English and Italian, showing that crosslinguistic variation can be derived from independently motivated mechanisms such as φ-probing, feature inheritance, and PF-deletion, in conjunction with well-established assumptions regarding EPP satisfaction, agreement, and phase accessibility.

3.2. Deriving Null Arguments in German

Let us now turn to the other predicted possibility under the current system—namely, (17)—and examine how the proposed mechanism accounts for the distribution of null arguments in German. Unlike Italian, German permits a wide range of argument drop in matrix clauses. Consider the following examples.

(24)	a.	(Ich)	hab’	ihn	schon	gesehen.
		(I)	have	him	already	seen
		‘(I) saw him already.’				
	b.	(Ihn)	hab’	ich	schon	gesehen.
		(him)	have	I	already	bought
		‘I saw (him) already.’ (Huang, 1984, p. 547)				
	c.	(Ich)	habe	es	gestern	gekauft.
		(I)	have	it	yesterday	bought
		‘(I) bought it yesterday.’				
	d.	(Dass)	habe	ich	gestern	gekauft.
		(that)	have	I	yesterday	bought
		(That,) I bought yesterday.’ (Deal, 2005, p. 33; Cardinaletti, 1990, p. 75)				

As illustrated in (24a–d), both subjects and objects may be dropped in German matrix clauses. This contrasts with Italian, where null subjects are permitted but null objects are generally disallowed. This asymmetry has led some researchers to question the viability of a unified analysis of null arguments in the two languages.

Under the present analysis, however, this contrast follows naturally from the type of probe responsible for delete-feature assignment. In V2 environments, such as German matrix clauses, the delete feature remains on C rather than being inherited by T. As a result, the target of PF-deletion is determined through EF-probing from C, as schematized below.

(25) $C_{[EF][Delete]} \ldots T$

Under this configuration, PF-deletion applies to any element within the search domain of C: since EF is not constrained by minimality, EF-probing from C can target either the subject or the object directly.

(26) [$C_{[EF][Delete]}$ … Subj … Obj]

If the EF probes the subject, the delete feature is assigned to the subject, yielding (27a); if it probes the object, the object is deleted, as in (27b).

(27) a. [$C_{[EF]}$ … ~~Subj~~$_{[Delete]}$ … Obj]] (= (24a, c))

b. [$C_{[EF]}$ … Subj … ~~Obj~~$_{[Delete]}$]] (= (24b, d))

Thus, the relatively free argument drop observed in German matrix clauses is attributed to the unrestricted probing capacity of the EF on C. Crucially, as illustrated in (27b), because EF-probing from C is not constrained by minimal search, the delete feature can target the lower object across the intervening subject.[10] This, in turn, permits the object to undergo PF-deletion.[11]

One potential concern is how the EPP requirement on T is satisfied in derivations such as (27a), where the subject undergoes PF-deletion. This issue, however, does not arise if the EPP is triggered only when a tense feature is inherited from C to T (see Abe, 2015; Bošković, 2002, for relevant discussion; both argue that the EPP is absent in infinitival clauses lacking independent tense). Under the present proposal, since feature inheritance does not apply in V2 environments, the EPP on T is not activated. As a result, the presence or absence of the subject becomes immaterial in contexts such as (27a–b).

The current system makes the following prediction: if the EF on C is satisfied by some element, then C should no longer be able to probe either the subject or the object for the purpose of delete-feature assignment, as the EF becomes inactive once satisfied. This prediction is borne out by the following examples.

(28) a. Ihn hab’ *(ich) schon gesehen.
him have (I) already seen
‘(I) saw him already.’ (Huang, 1984, p. 547)

b. Ich hab’ *(ihn) schon gesehen.
I have (him) already seen
‘I saw (him) already.’ (Huang, 1984, p. 547)

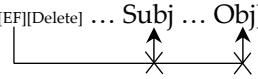
c. Jetzt kenne *(ich) das nicht.
now recognize (I) that not (Sigurðsson & Maling, 2008, p. 6)

d. Jetzt kenne’ich *(dass) nicht.
now recognize’I (that) not (Sigurðsson & Maling, 2008, p. 14)

e. Wer hat *(es) schon gesehen?
who has (it) already seen
'Who has already seen it?' (Rizzi, 1986, p. 513, fn. 8)

As schematically illustrated in (29), when another element occupies Spec-CP and satisfies the EF, EF-probing is not triggered, and the delete feature is no longer available for assignment to the arguments. As a result, neither the subject nor the object can undergo deletion.[12]

(29) [CP ihn/ich/jetzt/wer $C_{[EF][Delete]}$ … Subj … Obj]

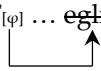


This pattern stands in contrast to Italian. As shown in (30), the subject may remain null even when Spec-CP is occupied by another element such as *dove* 'where'.

(30) Dove (egli) va?
where go-3g
'Where is he going?' (Deal, 2005, p. 35; see also Rizzi, 1994)

This follows straightforwardly from the present analysis. In Italian, since the deletion site is determined via φ-probing from T, the availability of subject deletion is independent of the EF on C. Accordingly, the subject may remain null even when the EF is satisfied by another element, as in (31), where *dove* satisfies the EF on C.

(31) [CP dove $C_{[EF]}$ [$T_{[\varphi]}$ … ~~egli~~$_{[Delete]}$]]



Thus, under our analysis, the two key contrasts between Italian and German—the availability of null objects ((22) vs. (28b, d, e)) and the sensitivity to CP-edge occupancy ((28) vs. (30))—can be uniformly accounted for in terms of the type of probe involved in delete-feature assignment: φ-probing from T in Italian (a non-V2 language), and EF-probing from C in German (a V2 language).

It is important to recall here that German displays an asymmetry with respect to V2 effects between matrix and embedded clauses. As shown in (32a–b), German matrix clauses exhibit V2 word order, whereas embedded clauses do not.

(32) a. Der Mann hat den Hund gesehen. (V2)
the man have the dog seen
'The man has seen the dog.'

b. Er sagte daß der Mann den Hund gesehen hat. (non-V2)
he said that the man the dog seen have
'He said that the man has seen the dog.'

If the present analysis is correct, then in non-V2 environments such as German embedded clauses, C-to-T feature inheritance applies, thereby activating the EPP on T. As a consequence, delete-feature assignment is carried out via φ-probing from T, as in languages like Italian and English. It follows, then, that null objects are disallowed in German embedded clauses due to intervention effects arising from φ-probing—unlike in matrix clauses, where delete-feature assignment is mediated by EF-probing from C (cf. (28b, d, e)). This prediction is indeed borne out, as shown in (33).

(33) a. Du weißt, dass ich *(sie/ihn/es) gesehen habe.
you know that I (her/him/it) seen have
'You know that I have seen (her/him/it).' (Cardinaletti, 1990, p. 76)

b. Sagt Hans, hat/habe er *(es) gesehen.
says Hans has/have-subj he (it) seen
'Hans says he has seen (it).' (Deal, 2005, p. 40; Cardinaletti, 1990, p. 77)

Furthermore, given that German lacks a morphologically rich agreement system compared to languages such as Italian (Müller, 2005), it is reasonable to assume that, like English, German does not employ V-raising as a means of satisfying the EPP in embedded contexts. Accordingly, although null subjects are in principle permitted via φ-probing, as in Italian and English, their deletion leads to an EPP violation in the absence of V-raising—for the same reason as in English. We therefore predict that null subjects are likewise disallowed in German embedded clauses. This prediction is supported by the data presented in (34).[13]

(34) Hans glaubt *(ich) habe es gestern gekauft.
Hans believes I have it yesterdat bought
'Hans believes that I bought it yesterday.' (Rizzi, 2005, p. 14)

One reviewer asked whether, in (34), given that the verb appears to occupy C, it should be EF-probing from C rather than φ-probing from T that drives the delete-feature assignment. However, as discussed in Section 2.3, in embedded clauses where further structure is built above CP, TP undergoes transfer, and the requirement of valuation–transfer simultaneity makes feature inheritance from C to T obligatory, regardless of whether the clause displays surface V2. Accordingly, I assume that feature inheritance applies here as well, and that the delete-feature assignment in (34) would therefore be carried out via φ-probing from T.

Taken together, the contrast between German matrix and embedded clauses with respect to the availability of null arguments can be systematically attributed to the nature of the probe responsible for delete-feature assignment: EF-probing from C in matrix contexts, and φ-probing from T in embedded contexts. In this respect, German embedded clauses pattern with English, where both null subjects and null objects are constrained by the interaction between φ-probing and the EPP.

3.3. Deriving Null Subjects in Old Languages

Thus far, I have proposed that in V2 environments, where C-to-T feature inheritance does not apply, delete-feature assignment is carried out via EF-probing from C. However, it is important to recognize that an alternative possibility remains. In such environments, φ-features are not inherited by T but remain on C, raising the possibility that even in V2 environments, delete-feature assignment may be carried out via φ-probing from C. In what follows, then, I propose that even in V2 environments, where C-to-T feature inheritance does not apply, languages with rich agreement determine the target of PF-deletion via φ-features on C, rather than via the EF. I argue that this proposal provides a principled account of the distribution of null subjects observed in Old French, which displays a hybrid pattern incorporating properties observed in both German and Italian.[14]

Old French displays an asymmetry with respect to V2 effects between matrix and embedded clauses. As shown in (35), Old French matrix clauses exhibit V2 word order, whereas embedded clauses do not (Adams, 1987; Vance, 1997).

(35) *Old French*
a. Einsint aama la damoisele Lancelot. (V2)
thus loved the young lady-NOM Lancelot-ACC
'Thus the young lady loved Lancelot.' (Adams, 1987, p. 4)

b. Einsi corurent ___$_i$ par mer tant que il$_i$ vindrent (non-V2)
Thus ran (they) by sea until they came
à Cademelée
to Cadmée. (Adams, 1987, p. 2)

This pattern is also found in German. As shown in (36), repeated from (32), German displays an asymmetry in V2 effects between matrix and embedded clauses.

(36) *German*
a. Der Mann hat den Hund gesehen. (V2)
the man have the dog seen
'The man has seen the dog.'
b. Er sagte daß der Mann den Hund gesehen hat. (non-V2)
he said that the man the dog seen have
'He said that the man has seen the dog.'

Based on this parallel, one might expect Old French to pattern with German with respect to the distribution of null arguments. As illustrated in (37a–b), repeated from (24a) and (34), German permits null subjects in matrix clauses but not in embedded ones.

(37) *German*
a. (Ich) hab' ihn schon gesehen.
(I) have him already seen
'(I) saw him already.'
b. Hans glaubt *(ich) habe es gestern gekauft.
Hans believes I have it yesterdat bought
'Hans believes that I bought it yesterday.'

Contrary to this expectation, however, Old French allows null subjects not only in matrix clauses but also in embedded ones.

(38) *Old French*
a. Si firent ____ grant joie la nuit.
So made (they) great joy that night. (Adams, 1987, pp. 2–3)
'So they made great joy that night.'
b. S'il n'eüst le cuer aillors, bien se peüst apercevoir par
if he not-had the heart elsewhere well REFL-can.SUBJ perceive by
samblant que ___ l'amast por voir,
appearance that [he] her-love.SUBJ for to-see
'If he had not had his heart elsewhere, it could clearly be seen by appearance that [he] loved her in order to see.' (Hirschbuhler, 1989, p. 157)

This is, in fact, parallel to Italian, which, as shown in (39), permits null subjects in both matrix and embedded clauses.

(39) *Italian*
a. (Ella) parla tedesco.
She speaks German
'She speaks German.
b. so che cosa (te) hai detto.
know-1SG what thing you have-2SG said
'I know what you said.' (Deal, 2005, p. 35; Rizzi, 1994)

Thus, Old French exhibits a hybrid profile, combining properties of both German and Italian: it patterns with German in terms of V2 distribution, but aligns with Italian with respect to the availability of null subjects.

https://doi.org/10.3390/languages11020028

What is particularly noteworthy here is the behavior of null subjects in V2 matrix clauses in Old French. In such clauses, null subjects are permitted even when Spec-CP is occupied. For example, in (38a), the adverb *si* 'so' occupies Spec-CP, yet the subject remains null. Similarly, in (40a–c), *au matin* 'in the morning', *einsi* 'thus', and *lors* 'then' all appear in Spec-CP positions, and null subjects are nonetheless allowed.

(40) *Old French*

a. Au matin s'apareilla ____ por aler au tornoiement.
In the morning himself prepared (he) for to go to the tournament.

b. Einsi corurent ____$_i$ par mer tant que il$_i$ vindrent à Cademelée.
Thus ran (they) by sea until they came to Cadmée

c. Lors s'acorderent ____$_i$ que il$_i$ diroient que il$_i$ l'avoient
Then agreed (they) that they would say that they him had
baillié par le commandement Nichodemus.
in their charge by the commandment (of) Nicodemus. (Adams, 1987, pp. 2–3)

Under the proposed analysis, the difficulty of providing a unified account of this pattern becomes evident when compared with German. As shown in (41a–b), repeated from (28a) and (28c), German does not allow null subjects in V2 matrix clauses when Spec-CP is filled.

(41) *German*

a. Ihn hab' *(ich) schon gesehen.
him have (I) already seen
'(I) saw him already.'

b. Jetzt kenne *(ich) das nicht.
now recognize (I) that not

Interestingly, the fact that null subjects are permitted even when Spec-CP is occupied by another element is attested in Italian, a non-V2 language, as shown in (42), repeated from (30).

(42) *Italian*
Dove (egli) va?
Where go-3g
'Where is he going?'

Thus, while Old French shares the structural properties of V2 with German, its pattern of null subject availability more closely resembles that of Italian. The question, then, is how to account for this hybrid nature of Old French.

Based on the previous proposal, I assume that in Old French—like in German—C-to-T feature inheritance does not apply in V2 environments (i.e., matrix clauses), but does apply in non-V2 environments (i.e., embedded clauses). However, in languages with rich agreement like Old French, I propose that in V2 contexts where inheritance does not occur, delete-feature assignment is carried out not by the EF on C, but by φ-features that remain on C rather than being inherited by T. Accordingly, under this proposal, delete-feature assignment in Old French is carried out via φ-features on C in matrix clauses, and via φ-features on T in embedded clauses.

(43) $C_{[\varphi][\text{Delete}]}$ . . . T (Old French matrix V2 environments)

(44) C . . . $T_{[\varphi][\text{Delete}]}$ (Old French non-V2 embedded environments)

Significantly, the analysis in (43) offers a straightforward account of why null subjects remain permissible in V2 matrix clauses in Old French—even when Spec-CP is occupied, unlike in German. As shown in (45), although the EF on C is satisfied by an element XP in Spec-CP—such as *si* 'so' in (38a), or *au matin* 'in the morning', *einsi* 'thus', and *lors* 'then' in

(40a–c)—φ-features on C remain active and are responsible for delete-feature assignment. As a result, the subject can be targeted for PF-deletion regardless of the presence of an element in Spec-CP.

(45) $[_{CP}\ XP\ C_{[EF][\varphi]}\ [T\ \ldots\ \text{~~Subj~~}_{[Delete]}]]$

It is important to recall that the EPP on T is activated only when feature inheritance takes place. In configurations like (43), where inheritance does not apply, no EPP requirement is introduced on T. As a result, no EPP violation arises even if the subject is deleted, as shown in (45).

In contrast, in embedded contexts like (44), where inheritance does apply, delete-feature assignment is carried out via φ-features inherited by T, thereby allowing for null subjects, as illustrated in (46).

(46) $[C\ [T_{[EPP][\varphi]}\ [_{v^*P}\ \text{~~Subj~~}_{[Delete]}\ \ldots]]]$

At the same time, since feature inheritance introduces the EPP requirement on T, the derivation must also satisfy the EPP requirement. This issue, however, can be resolved if we assume that, like Italian, Old French employed a V-raising strategy for EPP satisfaction (see (19)).[15]

Accordingly, in Old French, delete-feature assignment is carried out via φ-features in both V2 matrix clauses and non-V2 embedded clauses, allowing for null subjects in both environments. In matrix clauses, where inheritance does not apply, the requirement to fill Spec-TP (EPP) does not arise. In embedded clauses, where inheritance does apply, the EPP requirement is introduced but satisfied through the V-raising strategy. What is crucial in this analysis is that, although Old French, like German, exhibits V2 word order in matrix clauses, the two languages differ with respect to the sensitivity of null subjects to CP-edge occupancy. While German disallows null subjects when Spec-CP is filled, Old French permits them regardless. This contrast is captured by attributing delete-feature assignment in German to the EF on C, which can target the subject independently of whether the CP-edge is occupied, whereas in Old French, assignment is mediated by φ-features on C, which remain active irrespective of CP-edge occupancy.

If Old German had a richer agreement morphology than Modern German, as is often assumed (Fuß, 2005; Axel & Weiß, 2011), then under the present analysis, we expect Old German—like Old French—to permit null subjects even in V2 matrix clauses where Spec-CP is occupied (see (45)). This prediction is supported by examples such as (47), where *sume* 'some' occupies Spec-CP, yet the subject remains null.

(47) *Old High German*

Sume	hahet	[e]	in	cruci
some	hang.2PL	(you)	to	cross

'Some of them, you will crucify.' (Axel, 2007, p. 293)

This pattern aligns with the expectation that in languages with rich agreement, φ-features on C can trigger delete-feature assignment irrespective of CP-edge occupancy (for V2 effects in Old High German matrix clauses, see Axel, 2007).

Haeberli (2005) observes that Old English, like German and Old French, displays a V2–non-V2 asymmetry: matrix clauses exhibit verb-second order, while embedded clauses do not. At the same time, van Gelderen (2013) notes that Old English permits null subjects not only in matrix clauses but also in embedded ones.

(48) *Old English matrix clauses (V2)*

a. Nu scylun ___ hergan hefaenricaes uard
now must *pro* praise heaven.kingdom's guard
'Now we must praise the lord of the heavenly kingdom.'

b. Nearwe genyddon on norðwegas.
Anxiously hastened *pro* on north.ways
'Anxiously, they hastened north.' (van Gelderen, 2013, p. 275)

(49) *Old English embedded clauses (non-V2)*

a. Him on mod bearn þæt ___ healreced hatan wolde medoærn
him to mind came that *pro* palace command would meadhall
micel men gewycrean
large men build

b. sume men secgað þæt þa beteran wæren þonne ___ nu sien
some men say that then better were than *pro* now are
'Some men say that the tides were better then than they are now.'
(van Gelderen, 2013, p. 276)

These facts can be captured straightforwardly under the present proposal, in parallel with the analysis developed for Old French. Specifically, assuming that Old English also exhibits rich agreement, the system predicts that null subjects are licensed via φ-probing from C in V2 matrix clauses, and via inherited φ-features on T in non-V2 embedded clauses, with EPP satisfaction achieved through V-raising.

4. Concluding Remarks

This paper has developed a probe–goal-based mechanism of PF-deletion that crucially incorporates C-to-T feature inheritance. By positing that C enters the derivation not only with φ-features and an edge feature but also with a delete-feature, I have argued that the licensing of PF-deletion is a natural consequence of phase-internal probing. The proposal eliminates the need for *pro* as a primitive of the theory and instead derives the distribution of null arguments from independently motivated operations in the syntax–PF interface.[16]

This approach offers a unified account of the distribution of null arguments across two seemingly divergent systems: Italian-type *pro*-drop and German-type topic-drop. Moreover, diachronic evidence from Old French and Old English reinforces the central claim that variation in null argument phenomena hinges on whether C-to-T inheritance takes place.

Taken together, these results suggest that C-to-T inheritance plays a pivotal role not only in shaping the architecture of the clause but also in capturing both synchronic and diachronic variation in the grammar of null arguments. By linking PF-deletion to fundamental mechanisms of phase theory, the analysis moves toward a more restrictive and explanatory theory of crosslinguistic variation.[17]

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The original contributions presented in the study are included in the article. Further inquiries can be directed to the corresponding author.

Conflicts of Interest: The author declares no conflicts of interest.

Notes

[1] Takahashi (2001) argues that *pro* cannot satisfy the EPP and thus concludes that the EPP requirement on T is optional in Italian. As evidence, he analyzes (ia) as a case in which the EPP is satisfied, whereas in (ib), it is not.

(i) a. Gianni verra. (Italian)
will-come
'Gianni will come.'
b. Verra Gianni.
'Gianni will come'

In this paper, following Alexiadou and Anagnostopoulou (1998), I adopt the traditional view that the EPP is obligatory in Italian and assume that in (ia), *Gianni* satisfies the EPP in Spec-TP, while in (ib), the EPP is satisfied by verb movement to Spec-TP (Goto, 2017). See Section 3.1 for details.Note that, unlike a phonetically null operator, a phonetically full *wh*-phrase can satisfy the EPP, as illustrated in (i):

(i) a. Who do you expect _ will see Mary?
b. Who do you believe _ to know Mary well?

As one reviewer has pointed out, the contrast between (5) and (i) suggests that the quality of silence matters for the EPP. While the trace/copy of the *wh*-phrase in (i) is linked to a phonetically overt element (*who*) and thus retains potential phonetic features required to satisfy the EPP, the empty operator in (5) is inherently null, lacking any phonetic content throughout the derivation; only the latter fails to meet the requirement that the EPP be satisfied by an overt element.

[2] Portions of this paper were presented at the workshop *Towards a Theory of Syntactic Variation* held at Bizkaia Aretoa, Bilbao, Spain (5–7 June 2013), and at the workshop *Current Issues in Comparative Syntax: Past, Present, and Future* held at the National University of Singapore (1–2 March 2018). I am grateful to Jun Abe, Richard Kayne, and Yosuke Sato for their invaluable comments and insightful discussions.

[3] This view is supported by D'Alessandro and Roberts (2008), who argue that agreement relations are morphologically realized when the probe and the goal are transferred within the same domain.

[4] For proposals suggesting that C-to-T inheritance is blocked under certain conditions, see Ouali (2006), Obata (2010), Goto (2011), Legate (2014), Gallego (2014), Aldridge (2017, 2018, 2019), and Erlewine (2018), among others.

[5] I am grateful to the reviewer for raising the question of what drives head movement in the present analysis. I assume that the relevant trigger is a tense-feature, either on C or on T, depending on whether C-to-T feature inheritance applies. Under this view, the well-known asymmetry in English—namely, that subject–auxiliary inversion appears only in matrix clauses—follows straightforwardly. In matrix clauses, C-to-T feature inheritance does not apply, and thus the tense-feature remains on C; therefore, T raises to C. In embedded clauses, by contrast, feature inheritance applies, and the tense-feature is transferred to T; consequently, the tense-feature remains on T, and T does not raise to C.The reviewer also raises an important related question: if English finite auxiliaries such as *have* and *be* undergo V-to-T head movement, why does English nevertheless fail to license *pro*-drop, unlike Italian (e.g., **Am having a coffee*)? This may suggest that V-to-T head movement alone is not sufficient to satisfy the EPP or to license a null subject. Rather, a sufficiently rich agreement system may be necessary to establish a <φ, φ> label robust enough to support *pro*-drop (Chomsky, 2015). I must leave the precise nature of this requirement for future research.

[6] For the purposes of this paper, it suffices to assume that the delete feature functions to instruct PF not to parse the element to which it is assigned—a view that has been adopted in various forms in the literature (see Merchant, 2008, among others). Note in passing that the present system assumes that only the C head can enter the derivation bearing a delete feature (see Sigurðsson, 2011, for a similar view). Given that *v** is also a phase head, one might argue that it, too, could bear a delete feature. However, I set this possibility aside here. The main motivation for doing so stems from the widely held intuition that null argument phenomena are closely related to discourse topics, and that discourse-related notions are crucially anchored in the CP phase. See Rizzi (1997, p. 283).A reviewer questions the conceptual motivation and formal status of the delete feature. The concern is that delete is described as something "assigned" rather than as a probe, which does not align with the probe–goal (agree) system, where unvalued features undergo valuation by a matching goal. Without treating delete as an uninterpretable/unvalued feature that requires valuation and inheritance under Richards' (2007) value–transfer simultaneity approach, its necessity within the current theoretical architecture is not fully justified.To address this concern, one possible implementation is to treat the delete feature on par with case. Case is a value "assigned" to an NP as the result of entering into an agree relation with T/*v**, and delete may be handled in a similar way. Under this view, delete—like case—"rides on" uninterpretable/unvalued φ-features and does not itself function as a probe. Richards' value–transfer simultaneity approach is assumed to apply to φ-features alone, with the assignment of case being parasitic on the valuation of φ. The precise nature of these features, including how case and delete participate in the externalization component, is an important issue that must be left for future research. I am grateful to the reviewer for drawing attention to this important point.

[7] The present proposal also yields a third prediction: in V2 environments, where C-to-T feature inheritance does not apply, φ-features remain on C, and delete-feature assignment is carried out via φ-probing from C—a point to which we will return in Section 3.3. I am grateful to Koldo Sainz for drawing my attention to this possibility.A reviewer has pointed out a fourth logical possibility: φ-feature inheritance from C to T takes place, but the delete feature nevertheless remains on C's EF, rather than being inherited. This configuration would predict a distinct empirical profile—potentially allowing A′-ellipsis phenomena without φ-related recoverability effects. While highly insightful, a detailed empirical investigation of such a system goes beyond the scope of the present paper and must be left for future research. I am grateful to the reviewer for drawing my attention to this important theoretical possibility.

[8] For head-to-Spec movement, see Fukui and Takano (1998); Toyoshima (2001); and Matushansky (2006). Based on Chomsky's (2013, 2015) proposal that the EPP reduces to labeling TP as ⟨φ, φ⟩, Goto (2017) argues that this can be achieved via V-to-Spec movement. This raises the question of why such movement is not observed in English, if allowed under free merge. Goto (2017) suggests that while V-to-Spec movement may occur in English, it fails to converge due to the lack of rich φ-agreement on the verb, which prevents successful labeling. Crucially, the present analysis is compatible with either view, and the argument below does not depend on this issue.

[9] Null objects are, in fact, attested in Italian. Consider the following example.

(i) Il bel tempo involgia __ a restare.
'The nice weather induces __ to stay.' (Rizzi, 1986, p. 503)

As Rizzi (1986) notes, however, such null objects are restricted to generic or arbitrary interpretations. While example (i) demonstrates that null argument phenomena in Italian are not exclusively subject-oriented, the present discussion is concerned specifically with referential null arguments—an option that is clearly confined to subjects. Accordingly, the case illustrated in (i) lies outside the scope of the current analysis.

[10] One might ask whether object deletion in (27b) violates the Phase-Impenetrability Condition (PIC), defined in (i) (Chomsky, 2000, p. 108).

(i) *The Phase Impenetrability Condition* (PIC)

In phase α with head H, the domain of H is not accessible to operations outside α; only H and its edge are accessible to such operations.

However, in (27b), the edge feature on v* triggers object shift to the outer specifier of v*P, thereby placing the object at the phase edge and within the accessible domain of C. Consequently, potential PIC violations are avoided.

[11] The reviewer correctly notes that West Flemish does not permit topic-drop despite being a V2 language (Sigurðsson, 2011, p. 271, footnote 5). One way to incorporate this fact within the analysis developed in the present paper is to adopt an underspecification approach to the ordering of narrow-syntactic operations (Obata et al., 2015). In this view, the relative ordering of operations such as move and probe is not fixed universally but may vary across languages. Given that C bears both EF and the delete-feature, two derivational possibilities arise: probe→move, where delete-feature assignment applies before EF-driven movement, and move→probe, where EF-movement precedes delete-feature assignment. I assume, as argued in the main text, that German instantiates the former option (probe→move). In contrast, if West Flemish is taken to instantiate the latter option (move→probe), then EF on C triggers movement to Spec-CP first. When the subsequent probing is initiated to assign the delete-feature, no matching goal is available within C's probing domain, because move has already removed the relevant DP from that domain. As a result, delete-feature assignment fails to apply, and topic-drop is not derived. Under this underspecification approach, cross-linguistic variation arises from differences in the ordering of otherwise identical syntactic operations, and no lexical parametric differences concerning the features of C need to be assumed.

[12] In V2 languages such as German, the EF associated with C is tied to the V2 requirement and typically attracts exactly one constituent to Spec-CP in root declaratives. As one reviewer rightly points out, although EF is theoretically undeletable in Chomsky's (2008) framework—thereby allowing for multiple applications of merge—its use in such V2 environments becomes empirically exhausted once the V2-driven movement operation is satisfied. Consequently, no further EF-probing from C is permitted.

[13] As one reviewer has pointed out, if German satisfies the EPP by VP-pied-piping to Spec-TP, as argued in Richards and Biberauer (2005), then the apparent EPP violation in (34) would seem to disappear. However, since (34) represents a V2 configuration, EPP satisfaction at Spec-TP is not at issue here.

[14] With respect to null objects in Old French, two main approaches have been proposed. According to one view, Old French does not permit null objects (Marchello-Nizia, 1995; Schøsler, 1999). According to the other, null objects are allowed (Arteaga, 1997; Donaldson, 2013). A full evaluation of the validity of these competing approaches lies beyond the scope of this paper. In what follows, I focus exclusively on null subjects and set aside the issue of null objects in Old French.

[15] This analysis raises an important question: why can Modern French not satisfy the EPP via the V-raising strategy, unlike Old French? To address this issue, I draw on two proposals: Chomsky's (2013, 2015) analysis that reduces the EPP to the requirement for a <φ, φ> label, and Biberauer and Roberts' (2012) claim that V-to-T movement in Italian is driven by φ-agreement, whereas in Modern French it is driven by tense-agreement. Building on these insights, I suggest that V-raising in Italian and Old French effectively satisfies the EPP—as it contributes to the formation of a <φ, φ> label—while V-raising in Modern French does not. The precise mechanisms involved are left for future research.

[16] Although interpretive asymmetries between null and overt pronouns in *pro*-drop languages have traditionally been attributed to grammatical constraints such as the Overt Pronoun Constraint (OPC; Montalbetti, 1984), more recent studies suggest that these effects may instead arise from interface-driven principles. In particular, Alonso-Ovalle et al. (2002) argue that such asymmetries are better explained by processing principles sensitive to syntactic position, as further developed in Carminati's (2002) Position of Antecedent Strategy, as well as by interactions with topic–focus structure.Within the present proposal, *pro* is not treated as a primitive element with special interpretive properties. Rather, it is derived by PF-deletion of a syntactically ordinary pronoun licensed via agree (φ-probing). While our analysis does not in itself derive interpretive differences between deleted and overt pronouns, it is compatible with the view that any such effects follow from independently motivated principles of information structure and discourse recoverability, rather than requiring a distinct syntactic representation for *pro*. I am grateful to a reviewer for drawing our attention to this issue.

[17] A reviewer raises the question of how the present proposal might account for radical *pro*-drop languages, such as Japanese and Chinese. With respect to this issue, I agree that the argument omission patterns in these languages are not straightforwardly reducible to φ-feature-driven PF-deletion, given the absence of obligatory φ-agreement. In this respect, it is conceivable that EF-probing may play a role. A fuller investigation of how such systems might interact with—or diverge from—the present deletion-based approach is left for future research.

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