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The derivational timing of ellipsis: An overview of theoretical approaches

Anikó Lipták and Güliz Güneş

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Abstract

PF-deletion accounts of ellipsis currently enjoy popularity in the mainstream generative framework. These approaches assume that elided material has full syntactic representation. Since ellipsis clearly impacts the actual phonetic realization of a sentence, the lack of pronunciation in ellipsis is understood in these accounts as some kind of silencing of the syntactic structure, which takes place at PF. While this much is agreed on, there is no consensus yet within PF-deletion theories on the question of what operation (or lack thereof) in the derivation of the syntactic and/or the PF presentation causes the silencing. This chapter summarizes and highlights the attempts that have been made to determine when ellipsis applies in the grammar. By bringing together different views on the topic, we hope to pave the way towards a better understanding of the nature of ellipsis itself in silent structure theories.

Keywords: ellipsis, architecture of grammar, narrow syntax, PF, LF, interface, PF-deletion, phase, spell-out, derivational timing

1. Recent research on ellipsis in the generative tradition

In the last few decades, research on ellipsis has expanded drastically within the generative syntactic tradition. Detailed theoretical and empirical studies of elliptical phenomena have appeared in a wide range of languages and various language families. These studies put forth various proposals about the theory of ellipsis, on issues such as (i) the licensing of ellipsis, (ii) the identity relation between the ellipsis site and its antecedent, and (iii) the representation of elliptical clauses across the modules.

The expansion of research into these areas is due to several factors. One is that the availability of a growing amount of cross-linguistic data allow for the study of the attested intra- and interlinguistic variation in many elliptical phenomena (sluicing, predicate ellipsis, nominal ellipsis, gapping, stripping, and fragments, to name a few; see van Craenenbroeck and Temmerman 2018 for a recent overview and references). The other is that ellipsis is not only interesting in and of itself, it also provides a window into the working of grammar, in particular the interaction between syntax and the interfaces that connect the meaning and the sound components (Schwabe and Winkler 2003, Winkler 2005, 2018, Johnson 2008). Additionally, ellipsis is a discourse phenomenon that provides the ideal testing ground for discovering the syntactic and semantic properties of cross-clausal and cross-sentential relationships (Fiengo and May 1994, Kehler 2002, Kempson et al. 2015). As an interface phenomenon *par excellence*, ellipsis confronts the analyst with the question of how syntax and the interfaces connecting syntax to sound and meaning interact in allowing elliptical phenomena to emerge. That is, it allows us to have a better understanding of the architecture of the grammar.

The nature of ellipsis as an interface phenomenon is clear when it comes to the current understanding of the three fundamental issues mentioned above. In syntactic approaches (e.g. Lobeck 1995, Merchant 2001, Johnson 2001, Aelbrecht 2010), the *licensing* conditions on ellipsis have been predominantly defined as morpho-syntactic environments in which ellipsis can occur. However, it is clear that these conditions also extend to discourse conditions and

conditions on information structure, such as the articulation of focus and givenness or the need for particular elliptical utterances to provide an answer to the Question Under Discussion (QUD) (see Rooth 1992, Anderbois 2018, Ginzburg and Miller 2018, Ginzburg and Sag 2000, Kehler 2000, Kertz 2013, Winkler 2005, 2016, Reich 2007, Barros 2014, Weir 2014, Frazier 2018, Griffiths 2019a, among many others). The question of how the *identity* relation between ellipsis and its antecedent (when present) and the notion of *recoverability* of the elided material should be defined has been answered with reference to semantics alone (Sag and Hankamer 1984, Merchant 2001), syntax alone (Chung et al. 1995, Rudin 2019), and, in recent years, with reference to both, allowing for semantic and morpho-syntactic/lexical identity to operate in tandem (Rooth 1992, Fiengo and May 1994, Kehler 2002, Chung 2006, 2013, Merchant 2013a,b, Jacobson 2016).

Both of these issues are related to and are partially informed by the research that addresses the third issue, namely, the formal representation of the missing material in ellipsis, also called the “structure question” in Merchant (2018a). The structure question remains an important part of the theoretical interest in ellipsis to date, fueling debates. Considering an example like (1), the structure question boils down to how the unpronounced but understood verb phrase *like ellipsis* in the second conjunct should be formally represented: Does it have a syntactic representation or only a semantic one?

(1) Lisa likes ellipsis, but her students don’t.

There are two types of approaches that aim to answer this question. The non-structural approach—see among others Ginzburg and Sag (2000), Culicover and Jackendoff (2005) and Jacobson (2016, 2018)—takes the view that ellipsis countenances no structure. This approach suggests that in (1) there is no syntactic material corresponding to the denotation of the verb phrase *like ellipsis*, instead verb phrase ellipsis (VPE) picks up a salient property in the context, thus supplementing the semantic representation of elliptical sentences in the absence of syntactic structure. In such non-structural accounts, where there is no formal representation of the missing material, there is no formal relation between the elided item and preceding linguistic material either, so notions such as “antecedent” and “identity relation” have no role in the derivation of ellipsis. Similarly, since ellipsis is not an operation that is “taking place” at any point of syntactic structure building, the question of how to time such an ellipsis operation is not relevant, either.

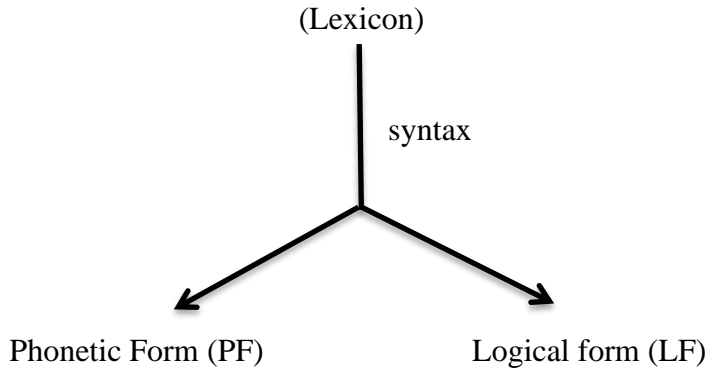
The other group of approaches—i.e., the structural approaches to ellipsis—posit some form of unpronounced syntactic material for the missing constituent or constituents. In those structural accounts that assume the presence of null elements, ellipsis sites correspond to empty lexical categories, such as (null) *pro* or some designated null terminal corresponding to a particular constituent in the syntax, which occupies the position of the missing constituent (Zagona 1988, Lobeck 1995, López 2000) or the individual terminals in it (Williams 1977, Wasow 1979). In an account like this, VPE in our example above is treated as a null proform without internal syntactic structure, where the nullness—the fact that this item is unpronounced—is a lexical property of the proform.

(2) Lisa likes ellipsis, but her students don’t \emptyset_{VP} .

Since the null proform is otherwise a regular anaphoric element, the ellipsis is targeted by an interpretive mechanism that applies to anaphoric elements (e.g. Hardt 1993). In other structural proposals, such as Chung et al. (1995, 2011) on sluicing or Saito (2007) and Sakamoto (2017) on argument ellipsis in East Asian languages, the empty element gains articulated internal structure by replacement—the “recycling” of linguistic structure that is available in the

discourse. The replacement supplies the missing constituent with interpretation at LF—the structural level of representation in the Y-model of the grammar that contains semantically relevant syntactic information, which forms the interface with interpretation (cf. the schematic representation in 3).

(3)



The PF-deletion approach, which is another type in the group of structural approaches, posits a full-fledged, ordinary syntactic representation of the elliptical material, which is present in the narrow syntactic component up to LF and PF. This kind of representation is special in that the elided linguistic material in it is silent but still present: it just remains unpronounced in PF; that is, the phonetic form corresponding to the sentence; see (3) again (Wilder 1997, Merchant 2001). This kind of silent structure is marked by strike-through in (4), indicating that the verb phrase in the elliptical clause retains its regular syntactic composition, and therefore ellipsis can only be a PF phenomenon.

(4) Lisa likes ellipsis, but her students don't ~~like ellipsis~~.

Note that the content of the missing verb phrase is recovered via the overtly expressed verb phrase *like ellipsis* in the first conjunct, that is, the *antecedent* of the ellipsis. Unpronounced syntactic structure in this case is structurally identical to the antecedent.¹

In recent years, there have been a growing number of works arguing for or adopting the PF-deletion analysis of ellipsis, taking the view that ellipsis (as defined in Sag and Hankamer 1984, referring to “surface anaphora” in Hankamer and Sag 1976, contrasting with the notion of deep anaphora) corresponds to unpronounced syntactic structure.² This is due to a variety of observations that argue for the presence of structure cross-linguistically. The four most widely discussed observations are (see nine other sets enumerated in Merchant 2018a): lower origin

¹ The conditions on identity between the elided material and its antecedent, and the role that structural and morphosyntactic identity plays in it (usually referred to as isomorphism) has been subject to several investigations; see Lipták (2015) and Poppels (2020) for an overview. Within PF-deletion approaches, structural isomorphism with a linguistic antecedent is standardly taken to be a requirement in the case of VP ellipsis (see Kim and Runner 2018 for recent experimental evidence), while sluicing is known for its ability to contain silent structure that may not be isomorphic to its antecedent, such as a copular clause, a (pseudo)cleft or certain lexical items (van Craenenbroeck 2010a, Barros 2014, Vicente 2018). In addition, sluicing can also contain elided modals or tense markers not found in the antecedent, which led Rudin (2019) to define the *eventive core* as the minimal syntactic domain that needs to be isomorphic in sluicing (see Anand et al. 2021 for refinements).

² Missing constituents with “deep anaphoric” properties (Hankamer and Sag 1976), on the other hand, are standardly analysed as a null proform or as a proform that undergoes ellipsis; see, among others, the analysis of exophoric VP ellipsis or Null Complement Anaphora in Merchant (2004) and Cinque (2004) respectively.

effects (constituents outside the ellipsis site having an origin inside the ellipsis site), locality effects (constituents with lower origin being subject to syntactic locality), the P-stranding generalization (constituents with lower origin being subject to ordinary rules of preposition stranding), and case matching (elliptical remnants being assigned case by ellipsis internal case assigners). These facts are expected if ellipsis is represented by full-blown syntactic structure, but they are more difficult to explain if ellipsis sites do not contain any syntactic structure or correspond to null (pronominal) anaphors that lack internal syntactic structure.³

While PF-deletion accounts of ellipsis enjoy popularity in the generative framework, the PF-deletion accounts currently on the market are far from being uniform about an important but often somewhat neglected aspect of elliptical phenomena, namely the exact *derivational timing* of the ellipsis as an operation. Understanding the derivational timing of ellipsis to refer to the point at which ellipsis applies in the Y-model (see (3) again), the question boils down to locating ellipsis in the architecture of the grammar. While all PF-deletion proposals agree that ellipsis is “operationalized” in PF in the sense that ellipsis manifests itself as some kind of a deficiency of certain operations at PF, resulting in missing phonetic material (thus the term “PF-deletion”), opinions differ on what type of PF deficiency ellipsis represents and whether this deficiency has any symptoms already in syntax.

Timing ellipsis derivationally in this way is quite difficult, as the matter cannot be decided by looking at empirical data only. A lot depends on one’s theoretical framework, particularly the theory of and the assumptions made about the order and timing of operations in the syntax and the PF-branch of the grammar. In the rest of this introduction, we provide a state-of-the-art overview of approaches that try to define the derivational point at which ellipsis applies. Due to space limitations and the vast literature on PF-deletion accounts on various languages, this introduction will not be able to do justice to the full range of proposals; instead it intends to highlight the most dominant proposals on the matter.

The structure of the chapter is as follows. Section 2 provides an introduction to various kinds of PF-deletion approaches focusing on the question of how they define the derivational timing of ellipsis. As we will see, there are two main types of approaches: those that place ellipsis in the postsyntactic component and those that place it in narrow syntax. Section 3 presents an overview of the empirical domains that can be used to inspect the time that ellipsis takes place. Section 4 provides a short summary of the novel proposals that are collected in this volume.

2. Timing ellipsis in PF-deletion approaches

“PF-deletion approach” is a cover term used for approaches assuming full syntactic representation and PF-non-realization of ellipsis sites. This approach has its origins in earlier accounts of deletion in which syntactic structures were subject to non-pronunciation (Ross 1967, Sag 1976b, Hankamer 1979). PF-deletion approaches differ in stating what PF-non-realization amounts to, and how and when ellipsis “happens” in the course of the derivation: either only in the PF branch of the grammar or already in narrow syntax. In this respect, two types of proposals can be distinguished: non-derivational PF-deletion proposals of ellipsis claim that ellipsis applies only in PF and does not interfere with narrow syntactic computations. Derivational ellipsis proposals, on the other hand, claim that ellipsis interferes with the narrow syntactic computation in specific ways and that it thus already applies in the syntax. Derivational approaches share the view that, as soon as ellipsis takes place, the ellipsis site becomes inaccessible, with the effect that no further operations can target parts of the ellipsis site.

³ See also Mateu and Hyams (2021) for experimental data on child language acquisition that support the existence of structure (and movement) in sluicing.

This section summarizes the basic proposals of both derivational and non-derivational approaches in the following order. Sections 2.1 to 2.3 are dedicated to non-derivational accounts. The (by now) classical ‘[E]-feature approach’ is introduced in Section 2.1. Section 2.2. presents some background on key notions concerning the postsyntactic component. The lengthy Section 2.3 introduces proposals that define ellipsis with reference to some operation at spell-out or after spell-out in the PF branch of the grammar. This section will also cover approaches to ellipsis that are formulated in the Distributed Morphology framework or with reference to late phonological deletion. Section 2.4 turns to accounts of derivational ellipsis, according to which ellipsis impacts narrow syntax and thus takes place quite early in the derivation.

2.1 Classical [E]-feature accounts and their implications

In the most influential PF-deletion account, Merchant (2001), PF-deletion is the result of an ellipsis-specific formal feature [E] present in the derivation of elliptical clauses on a head whose complement elides. The [E] feature has phonological and semantic properties in addition to syntactic ones. Consider for illustration the [E] feature of English sluicing, where ‘ φ_{IP} ’ is the phonological representation of the IP constituent that gets elided (Merchant 2004: 670–673).

- (5) a. the syntax of [E]: $E_{[uwh^*,uQ^*]}$
 b. the phonology of [E]: $\varphi_{IP} \rightarrow \emptyset / E \text{ ___}$
 c. the semantics of [E]: $[[E]] = \lambda p : e\text{-GIVEN}(p) [p]$

The syntactic property of [E] in (5a) defines the morphosyntactic licensing requirements of sluicing and ensures local checking on a syntactic head. As [E] itself is endowed with uninterpretable and strong [+wh,+Q]-features that are in need of checking in a local relationship with a wh-interrogative C^0 head, [E] must occur on the C^0 head of constituent questions. The phonological properties of [E] defined in (5b) provide the instruction for PF to skip the complement of C^0 when it comes to phonological realization and production. As a result, the ellipsis site will not be incorporated into the PF structure of the clause that exhibits ellipsis. The semantics of [E] on the other hand encodes the recoverability requirement on the elided content by requiring e-GIVENNESS for it (where an expression is e-GIVEN if it has an appropriate antecedent defined in terms of a specific entailment relation, see Merchant 2001: 23–37 for more details).

The above proposal in Merchant (2001) and many accounts that adopt this proposal, such as van Craenenbroeck and Lipták (2006), Toosarvandani (2009), Arregi (2010), and Temmerman (2013), among many others, represent the classical [E]-feature-based account. According to these, ellipsis only has PF-effects, and it is syntactic only inasmuch as implementing the ellipsis *licensing* condition is concerned. Since ellipsis is only available in some syntactic environments but not others, there has to be something in the syntax that indicates whether ellipsis is well-formed: this is the role of the [E]-feature, a syntactic feature carrying a set of formal features to be checked locally. Thus, in these accounts, the [E]-feature is checked off as part of the syntactic computation, but the narrow syntax of an elliptical clause is not impeded by any means.

In accounts such as these, effects of ellipsis on syntactic phenomena, such as the locality of extraction or head movement, are typically explained with reference to the PF-uninterpretability of some offending element, such as a trace or a formal feature. The fact that certain types of clausal ellipsis can repair some island violations is attributed to these violations being properties of pronounced syntactic structures but not of unpronounced ones—the so-called PF-theory of islands; see Ross (1969), Chomsky (1972) and Merchant (2001, 2004), Griffiths and Lipták

(2014).⁴ In a similar spirit, a lack of head movement, such as the absence of English T-to-C movement out of a sluicing site, as in (6b), is attributed to PF-deletion involving deletion of an offending formal feature or some kind of PF defectivity on a non-realized terminal.

- (6) a. Lisa has called someone.
b. Who (*has)?
c. Who has Lisa called?

In Lasnik (1999a, 2001), matrix T has a strong feature that normally yields a PF-crash when it remains unchecked by movement to C; if TP is deleted, the strong feature is eliminated and a grammatical output results without head movement (see also Aelbrecht and Harwood 2015 for a similar analysis applied to auxiliary raising out of VPE sites). Merchant (2001) mentions that the strong feature can also be located in T if one takes this feature to normally motivate movement to C and trigger pied-piping of the entire T head with it. In TP ellipsis, this strong feature moves to C alone, without pied-piping the entire head, and ellipsis eliminates the PF-crash that is caused when a partial feature bundle on T is left behind. Boeckx and Stepanović (2001) formulate an alternative account of these facts in terms of derivational timing: they assume that T-to-C head movement is a PF phenomenon that applies after ellipsis; consequently, ellipsis bleeds head movement by disrupting its formal context. The latter approach, however, cannot be on the right track, as Landau (2020a) argues: T-to-C movement extends scope for negation and modals, so this movement must be syntactic movement and not PF-movement. Landau also shows that (6b) cannot be explained with reference to deletion of a C' constituent, so the bleeding effect of ellipsis on head movement in this case is real.

2.2 Introduction to spell-out and the PF-branch of grammar

The classical [E]-feature account did not specify the exact effect of the [E]-feature on phonology proper (cf. Merchant 2004: 671: “how this should be implemented in current models of phonology is not germane to my interests here”). The [E]-feature account did not define the position of the silencing operation in the branch of the grammar that is currently known as the “postsyntactic” component or the “PF-branch” either, as the nature of this branch was not clearly known at the time. With the growing and more widely accepted body of work dedicated to defining the existence and the nature of the PF-branch, a more precise timing of ellipsis is now becoming possible.

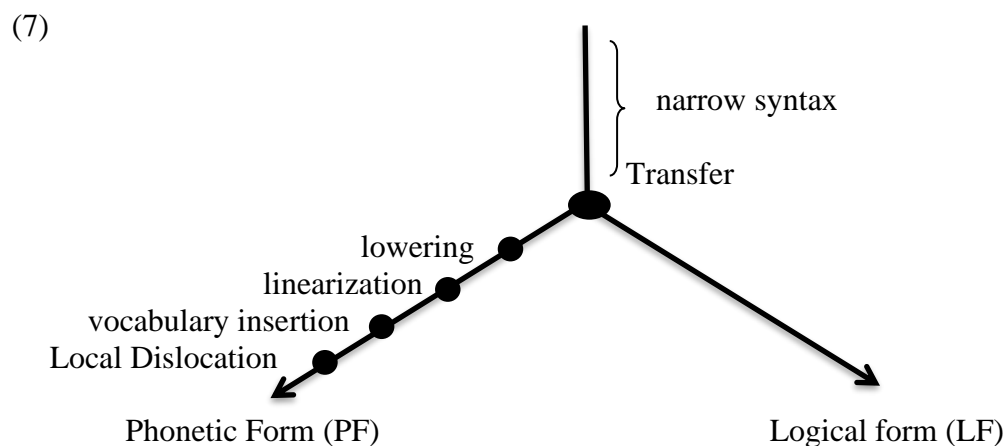
What exactly blocks the production of an ordinary phonological representation for a given syntactic item can be more precisely specified in the phase-theoretic Minimalist syntactic framework, in which the PF-branch is accessed at well-defined points during the derivation (Chomsky 2000, 2001), and in frameworks in which the PF-branch of the grammar is composed of multiple, serially ordered operations, such as Distributed Morphology. This section provides some details on the most relevant features of these frameworks so that proposals about ellipsis that use these features, which will be discussed shortly, can be fully appreciated.

Distributed Morphology incorporates the syntactic tenets of Minimalism but rejects the idea

⁴ An alternative explanation about the repair effect of ellipsis on island violations is that islands can be “evaded”. This is an idea that goes back to Erteschik-Shir (1973). Island insensitivity under ellipsis in this approach is due to an available evasion strategy (e.g. copular predication), a not fully isomorphic structure underlying the ellipsis that does not contain an island in the first place (see Barros et al. 2015). Island evasion, however, might not be able to explain all cases of island insensitivity, as Yoshida et al. (2015, 2019) point out. See also Abels (2018a) for other types of criticism of evasion approaches.

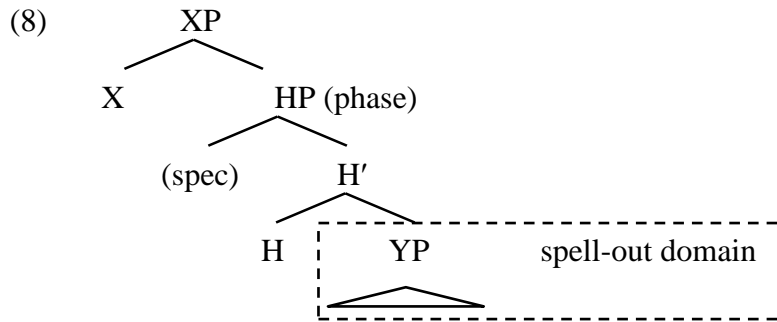
that there is a separate component responsible for the morphology of a language; see Halle and Marantz (1993), Harley and Noyer (1999), Embick and Noyer (2001), and Arregi and Nevins (2012), among others. Distributed Morphology assumes the conventional Y-model in (3), in which syntax is responsible for creating hierarchical relations in what is referred to as the *narrow syntactic derivation*. The hierarchical structure is built from morphemes (and not from precompiled words as in lexicalist frameworks), with actual vocabulary inserted late. When complete, the syntactic hierarchy is transferred to Logical Form (LF) and Phonological Form (PF), which interpret these structures independently. The operation of Transfer to PF (Chomsky 2000, 2004; see below) is followed by several serial and modular operations that provide the input to surface phonological representations. These modular operations are often called the *postsyntactic component* or the *PF-branch*, and contain word-forming operations, among other things.

After Transfer to PF but before the PF-operation Linearization, morphological operations such as Lowering (movement of a head to the head of its complement), Fission or Fusion of morphemes take place. At this stage, the output of Transfer retains its hierarchical structure, and therefore the above-named morphological processes apply to a hierarchical structure. Following this stage, a linearization procedure provides abstract nodes with precedence relations, and hereafter only linear relations between nodes (subsequence, precedence) are relevant. Vocabulary insertion provides abstract nodes with phonological exponence, replacing morphosyntactic features with phonological content.⁵ Concerning the timing of linearization and vocabulary insertion with respect to each other, in this introduction we follow Arregi and Nevins (2012) in taking linearization to precede vocabulary insertion (based on the observation that contextual restrictions on vocabulary insertion are sometimes based on linear adjacency). Once linear order is formed and vocabulary items are inserted, further morphological operations, such as Local Dislocation (displacement of two morphemes) can take place. Following all postsyntactic operations, in the final stages of the PF-branch, prosodic domains are formed, phonological rules apply, and a complete phonological representation is prepared. The order of the above-mentioned stages of the derivation up to this point are visualized in (7).



⁵ Vocabulary insertion chooses a vocabulary entry for insertion for each syntactic terminal, where the choice is made on the basis of the morphosyntactic features on the node, following the *Subset Principle* (Halle 1997), which dictates that the entry that realizes the maximal subject of the node's morphosyntactic feature is inserted.

Before moving on, it is also important to specify the nature of the operation of Transfer more closely, which is often referred to as *spell-out* in works on syntax.⁶ While in (7) it is marked as a single point in the derivation, current Minimalist syntactic theory (Chomsky 2000, 2001 and many others) actually assumes that the derivation of a sentence accesses PF and LF at multiple times, and consequently, we can speak of *multiple spell-out* operations. Spell-out in this sense is the removal of the syntactic domain that is the complement of a phase-head, the so-called *spell-out domain*, from the syntactic derivation. In the abstract representation in (8), the spell-out domain is marked by a box. As *v* and C are standardly taken to be phrase heads, the spell-out domains are standardly taken to be VP and TP.



The complement of the phase-head is removed from the syntactic derivation and transferred to the interfaces in order to be inspected for convergence, in accordance with the Phase Impenetrability Condition (PIC) defined in (9). The PIC specifies that when the phase HP is complete, the complement of H is transferred to PF and LF and becomes syntactically inactive for further syntactic operations.

(9) *Phase Impenetrability Condition (PIC)*

In a 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. (Chomsky 2000: 108)

The edge of HP, which is the specifier and the H head, is still syntactically active for further operations triggered by material above the phase.

As specified above, *v*P and CP are standardly defined as phases across languages, but other constituents have also been argued to qualify. In the nominal domain, DPs have been identified as phases (Svenonius 2004; Bošković 2014), and in the clausal domain the progressive aspectual layer has been argued to be a phase, when present (Harwood 2015). In addition, the PP has been argued to be a phase in some languages but not others (Abels 2003), and in general it has been proposed that the status of some phase heads might be variable, including cross-linguistically (e.g. Den Dikken 2007, Gallego 2010, Bošković 2014, Wurmbrand 2017, among others).

2.3 Fine-tuning the time of ellipsis in the PF-branch of grammar

This section presents an overview of the proposals that define ellipsis as an operation that applies at Transfer/spell-out or in the PF-branch proper, with reference to the frameworks and their concepts introduced in the last section.

⁶ Note that *spell-out* is used with slightly different coverage in Arregi and Nevins (2012). It refers not to the mapping of syntax to PF and LF, but to the sequence of derivational steps that take place after narrow syntax and before the phonological computation proper.

2.3.1 Ellipsis as lack of Transfer to PF

In van Craenenbroeck and den Dikken (2006), ellipsis is referred to as failure of transfer to PF, which results in the non-application of spell-out of the elided material. The core empirical contribution of this work is that EPP-driven movement is suspended under ellipsis, following Merchant (2001). The latter work proposes that subjects do not occupy a derived position under sluicing (unlike in non-elliptical clauses), but stay in their base position, which explains why subjects do not behave as islands in sluicing:

- (10) a. * [Which Marx brother]₁ is [a biography of *t*₁] going to be published this year?
b. A biography of a Marx brother is going to be published this year; guess which one!

Van Craenenbroeck and den Dikken (2006: 658) apply this kind of reasoning to the data in (11) from the realm of NPI licensing. To explain why the elliptical clause in (11b), but not (11a) is well formed, they suggest that the NPI subject is licensed as it stays in its base position where negation c-commands it, as shown in (11c), a representation that follows the so-called *in-situ* view of ellipsis, to which we will return in section 3.1. (see den Dikken, Meinunger, and Wilder 2000 for details):

- (11) a. * Any of the printing equipment didn't work.
b. A: What didn't work?
B: Any of the printing equipment.
c. [TP ~~did not~~ [_{VP} any of the printing equipment] ~~work~~]

The authors also show that complementizer agreement and sluicing interact in Dutch dialects in a way that confirms the view that ellipsis bleeds EPP movement. While complementizer agreement is possible in some varieties when the subject has moved to Sp,TP (as in 12a), this kind of agreement is not permitted in sluicing (as in 12b).

- (12) a. Jan weet niet wie darr-e wiej gezien hebt. *Hellendoorn Dutch*
Jan knows not who that-AGRwe seen have
'Jan doesn't know who we have seen.'
b. Wiej hebt 'r ene ezeen, en Jan weet niet wie(*-e).
we have there someone seen and Jan knows not who-AGR
'We have seen someone, but Jan does not know who.'

If subject movement to Sp,TP is bled under ellipsis, complementizer agreement with the subject cannot obtain. Van Craenenbroeck and den Dikken suggest an explanation for all these observations about ellipsis bleeding EPP-driven movement, with reference to the idea that PF-deletion is lack of Transfer and EPP-satisfaction is a PF-requirement: if elided material does not reach PF, it cannot be the cause of PF-violations, either.

2.3.2 Ellipsis as the spell-out of the ellipsis domain

With reference to the operation of Transfer introduced Section 2.2, some PF-deletion accounts define ellipsis as a form of spell-out in which the domain of spell-out is not realized in PF, thus the term *zero spell-out* in Wurmbrand (2017). These accounts tie the possibility of ellipsis to phase-theoretic notions, the null assumption being that the syntactic units that can be targeted

by deletion are non-distinct from those units that are sent to PF.⁷ Accordingly, ellipsis sites can be defined as spell-out domains (the complement of a phase head, as in (8)), and conversely, phase heads can be defined as ellipsis licensors; see Takahashi (2004), Gengel (2008, 2013), Gallego (2009), Rouveret (2012), and Bošković (2014) for claims of this type. In canonical non-coordinative ellipsis (clausal, predicate, and nominal ellipsis) some phase heads can indeed act as ellipsis licensors: the C head licenses deletion of the TP in many clausal ellipsis contexts and many languages, *v* can license deletion of VP in some languages, and some types of determiners (D heads) license deletion of the NP (nominal ellipsis).

Constituents that are not typically identified as complements to phase heads can undergo ellipsis in some languages, however, such as AspP in Dutch (Aelbrecht 2010) or the CP in English and German (Abels 2018b) to name just two. Observations of this sort are not necessarily problematic. On the one hand, phase heads and thus spell-out domains can vary across languages. On the other hand, it is possible that we need to adopt a more flexible formulation of phasehood and convergence (see the so-called *dynamic* approach to phasehood in Bošković 2014 and Wurmbrand 2017), where a phase is defined as the highest projection of a cyclic domain or an extended lexical projection. It has also been suggested that ellipsis can correspond to the deletion of an entire phase (Holmberg 2001), or that it can target either the phase complement or the entire phase (the two privileged domains in phase theory), see Bošković (2014) and Harwood (2013, 2015) for suggestions of this type. It is important to note that standard phase-based accounts of ellipsis also make a prediction concerning the inaccessibility of the ellipsis site. If ellipsis happens as part of the syntactic derivation—and in ways that are no different from ordinary cyclic spell-out—linguistic material in an elided constituent should be unavailable for syntactic operations in line with the PIC in (9)—a prediction that Aelbrecht (2010) considers not fully confirmed. We return to these issues in more details in Section 2.4 below.

Before finishing this section, mention must be made of accounts of ellipsis that capitalize on an alternative ellipsis-specific spell-out procedure, which is distinct from ordinary Transfer to the interfaces. Broekhuis (2018) and Broekhuis and Bayer (2020) argue that clausal ellipsis (including gapping) in Dutch involves what they call *selective spell-out*: A spell-out operation that pronounces the specifier but not the head of a phrase. In the case of the following instance of Dutch gapping this means that the remnants (*Marie* and *niets*) undergo A-bar movement into specifier positions into CP and NegP positions respectively, and the verb gets deleted.

- (13) Jan kreeg alles wat hij wou en/maar Marie ~~kreeg~~ niets.
 Jan got everything what he wanted and/but Marie got nothing
 ‘Jan got everything he wanted, and/but Marie got nothing.’

2.3.3 Ellipsis affecting linearization

A specific interaction of ellipsis with linearization is found in Fox and Pesetsky (2003, 2005), where ellipsis is defined as an operation that affects not only spell-out, but also linearization in a particular way. In line with mainstream phase-theoretical syntax, Fox and Pesetsky (2005) define spell-out as the mapping of syntax to PF, which takes place at multiple points in the derivation. The constituents that are mapped to phonology are referred to as spell-out domains in this work, and are defined to include at least CP, VP, and DP (in other words, Fox and Pesetsky do not distinguish between phrases and spell-out domains). Fox and Pesetsky assume

⁷ This assumption led Citko (2014) to define ellipsis as a PF-diagnostic of phasehood, but not without reservation: Citko (2014: 165) expresses the view that ellipsis might be a potentially unreliable diagnostic given that ellipsis licensing is known to show cross-linguistic variability.

that at each transfer to PF, which also includes the application of the linearization algorithm in their view, ordering statements are formed for each item transferred. As the derivation proceeds, and linearization is established on a phase-by-phase basis, these statements are stored in an ever-growing *Ordering Table*, specifying precedence relations for each terminal. At each Transfer, a newly generated ordering statement is added to the previous ordering statements in the Ordering Table. Consider for illustration the abstract scenario in (14), in which the spell-out and linearization applies to spell-out domain D1, with X, Y, and Z in it.

The ordering statements about these elements, which specify precedence relations (marked by the symbol < in the examples below), get added to an ordering table. When the next spell-out Domain, D2, is linearized, after movement of X from the edge position of the D1, new ordering statements get added to the ordering table.

(14) Abstract scenario 1

a. [D1 X Y Z] (spell-out domain)

Ordering table:

X<Y, X<Z

Y<Z

b. [D2 . . . X W [D1 t_X Y Z] (movement of X from the edge position)

Updated ordering table:

X<W, X<Y, X<Z

W<Y, W<Z

Y<Z

Note that movement of X into D2 is well formed, as X precedes all other elements in the spell-out domain D1. If X had originated in a non-edge position, the derivation would crash at PF, as in this case an ordering statement for D1, in which X follows something, would conflict with the ordering statement for D2, in which X comes to precede the very same item.

In Fox and Pesetsky's framework, ellipsis impacts on the mapping to PF in two ways: it results in the non-pronunciation of individual terminals in the ellipsis domain, and, in addition, it removes those linearization statements that mention these terminals, as defined in (15), which, in effect, means that ellipsis takes place upon linearization in this model.⁸

- (15) Ellipsis of α involves (i) the non-pronunciation of any terminal element dominated by α and (ii) the deletion from the Ordering Table of all ordering statements referring to the terminal elements dominated by α . (Fox and Pesetsky 2003: 21)

The fact that ellipsis removes linearization statements has non-trivial consequences. In the case of movement from a non-edge position, this means that ellipsis has a "liberating" effect: it makes movement of X from a non-edge position well-formed as well. To illustrate, consider the abstract scenario in (14a) again. As seen in (16b), if Y moves out of D1 from a non-edge position, there is an ordering conflict between X and Y, as both orders occur in the Ordering Table (the conflicting orders are bolded). If ellipsis applies to D1, however, as shown in (16c), all ordering statements that make reference to X and Z are eliminated, which results in the resolution of the ordering conflict between X and Y.

(16) Abstract scenario 2

a. [D1 X Y Z] (spell-out domain)

⁸ Fox and Pesetsky (2003) do not specify when vocabulary insertion takes place.

- Ordering table:
 $X < Y, X < Z$
 $Y < Z$
- b. $[_{D2} \dots Y W [_{D1} X t_Y Z]]$ (movement of Y from a non-edge position)
 Updated ordering table:
 $Y < W, Y < X, Y < Z, Y < Z$
 $W < X, W < Z$
 $X < Y, X < Z$
- c. $[_{D2} \dots Y W [_{D1} \cancel{X} t_Y \cancel{Z}]]$ (ellipsis of D1)
 Updated ordering table after ellipsis:
 $Y < W, \cancel{Y} < \cancel{X}, \cancel{Y} < \cancel{Z}, \cancel{Y} < \cancel{Z}$
 $\cancel{W} < \cancel{X}, \cancel{W} < \cancel{Z}$
 $\cancel{X} < \cancel{Y}, \cancel{X} < \cancel{Z}$

An advantage of this approach to ellipsis is that it predicts “salvation” effects of ellipsis on syntactic movements, allowing for movements that do not exist outside elliptical configurations. Movements of this type are referred to as *exceptional movement* (Thoms 2014) in *move-and-delete* approaches to clausal ellipsis (see Sections 2.3.5 and 3.1 on this and the opposing *in-situ* view of ellipsis).

The movement of the remnant in pseudogapping (as in (17)) is a case of exceptional movement in English, similarly to the movement of the second remnant in multiple sluicing, fragments or gapping (not illustrated here).

- (17) a. * John has travelled to Spain and Bill has to India_i travelled *t_i*.
 b. John has travelled to Spain and Bill has to India_i ~~travelled *t_i*~~.

As Takahashi (2004) and, following him, Fox and Pesetsky (2003) and Boone (2014) show, the movement of *India* here is only allowed in ellipsis contexts, as ellipsis removes the ordering conflict between this terminal and the verb *travelled*.

Another work that defines ellipsis as an operation that interferes with linearization is Johnson (2013). This work assumes that the linearization algorithm produces sets of ordered pairs of the terminals it applies to, followed by an operation called Form String, which normally produces a string of words out of a set of ordered pairs of vocabulary items, based on sisterhood (Form String forces a terminal in a phrase marker to be in the string if it has a sister). In elliptical utterances, the vocabulary item that functions as the ellipsis licenser is amnestied from being subject to Form String. As a result, the linearization algorithm does not need to spell out its sister adjacent to it, nor the sister node of this sister, and so on, for any node further down in the structure. Johnson shows that this conception of ellipsis accounts for the fact that ellipsis affects constituents and that the amnesty effect of Form String is responsible for enforcing ellipsis to occur in configurations in which Form String independently cannot apply, such as Andrews amalgams (such as *Sally will eat I don't know what today*).

2.3.4 The timing of ellipsis in the framework of Distributed Morphology

The Distributed Morphology framework (see Section 2.2 for an introduction) has been a fertile ground for research on ellipsis in recent years. As this section shows, proposals framed in this model have explicit views on the derivational timing of ellipsis, which is due to this framework's ability to time ellipsis with respect to a number of serially ordered operations in the PF branch that have been established in this framework independently of ellipsis.

A characteristic feature of many proposals framed in Distributed Morphology is that the PF-realization of ellipsis is defined as *non-insertion of vocabulary items*: ellipsis bleeds insertion

of vocabulary items into terminal nodes. The earliest proposal of this kind to our knowledge is Wilder (1997), which analyzes the lack of phonetic material in forward coordination-based ellipsis, such as gapping, as involving vocabulary items that fail to undergo insertion.⁹ Other proposals that put forth the idea that ellipsis causes vocabulary non-insertion include Bartos (2000, 2001), Kornfeld and Saab (2004), Saab (2008), Nunes and Zocca (2009), Aelbrecht (2010), and Temmerman (2012), as well as other proposals, some of which we discuss in the remainder of this section.

What kind of entity instructs PF to apply non-insertion is not a priori clear and is not always specified in these proposals. Clearly, the [E]-feature situated on the licensing head cannot be responsible for non-insertion directly on every elided terminal, as vocabulary insertion takes place in a bottom-up manner from the root (Embick 2010) and the [E]-feature containing head is inserted too late to block cyclic insertion of individual vocabulary items in the ellipsis site. For this reason, deletion should be implemented by other means on individual terminals themselves. Merchant (2015) therefore proposes a special diacritic that gets added to all terminal nodes in the c-command domain of the [E]-feature, a diacritic that preempts vocabulary insertion on terminals that it occurs on. An alternative approach is suggested by Saab (this volume) where non-insertion under ellipsis is defined as the blocking of Q-replacement on individual terminals, where Q is the placeholder variable that normally gets replaced with phonological content on abstract morphemes (Embick's 2015).

Late insertion theories are in principle also compatible with an alternative conception of ellipsis: the conception that ellipsis is not the lack of vocabulary insertion, but rather the insertion and subsequent deletion of inserted vocabulary through a phonological deletion process (as defined in Wilder 1997, see footnote 9 and Section 2.3.6).¹⁰ While Bartos (2001), conceived in the early days of Distributed Morphology, was sceptical about the chances of finding theory-external empirical evidence to distinguish between phonological non-insertion and phonological deletion accounts, evidence of this sort has been emerging in more recent years.

Late phonological deletion of inserted vocabulary items has been argued not to be the correct view of ellipsis for non-coordinative, forward ellipsis constructions, such as VP ellipsis or

⁹ Wilder (1997) proposes that backward coordinative ellipsis, such as right node raising (RNR), corresponds to actual deletion of inserted vocabulary items, meaning that in the latter cases, vocabulary insertion feeds phonological deletions. The difference between the two types of processes is supported by the observation that backward coordination-based ellipsis, unlike its forward equivalent, requires strict phonological identity between the ellipsis site and its licensor (see (i)) and, in addition, Wilder argues, the units that backward deletion can target appear to be phonological units, rather than syntactic ones.

(i) a. John said that I ~~love jazz~~ and Mary said that we love jazz.

b. * John said that I ~~love jazz~~ and Mary said that she loves jazz.

These observations point to the conclusion that backward deletion of this type can be viewed as a late phonological process, a conclusion that is also reached by Hartmann (2000, 2003), see Section 2.3.6. It is important to note that omission in backward contexts like (i) has also received analyses in terms of (rightward) movement or sharing of the pivot in multidominant representations, see Barros and Vicente (2011), Chavez (2014), Grosz (2015), and Wilder (2018), among others.

¹⁰ In addition to non-insertion and late phonological deletion approaches, one can find other mechanisms for ellipsis introduced within Distributed Morphology, such as the deletion of a terminal's feature content, as in Murphy (2016) and Banerjee (2020). Murphy (2016) argues that ellipsis should be thought of as insertion of null morphemes on individual terminals, for the specific case of ellipsis in gapping. In this proposal ellipsis corresponds to a postsyntactic impoverishment rule (called Total Impoverishment) that under specific conditions deletes all features on a given terminal. Terminals without any features are then realized as an "elsewhere" item, a null morpheme, and thus result in non-realization. Banerjee (2020) proposes that ellipsis is obliteration (maximal impoverishment) of terminal nodes in Bengali gapping, where all features of a terminal are deleted. This has the result that the obliterated terminal cannot trigger what the author defines as contextual allomorphy of a negative marker.

sluicing. For the case of VP ellipsis, late phonological deletion would make incorrect predictions about the distribution of ellipsis sites under code-switching, as pointed out by Merchant (2015). His argument is based on naturally occurring Greek-English code-switching examples, such as the following dialogue, which is well formed under ellipsis of the bracketed material, but ill-formed when that material is pronounced:¹¹

- (18) A: Píres tin tsánda mazí su? *Greek*
 took.2SG the bag with you
 ‘Did you take the bag with you?’
 B: Yes, I did <*pern tin tsánda mazí mu>.
 take[stem.form] the bag with me

Merchant (2015) argues that the problem of having the overt verb *pern* in B’s answer is morphological in nature: the stem form *pern* cannot ever surface in this form, as it needs to combine with a head with phi-features. If ellipsis were to apply after vocabulary insertion, the salvational effect of ellipsis cannot be explained with reference to a morphological problem, as morphological requirements must be satisfied right upon vocabulary insertion and not any time later. If, on the other hand, vocabulary insertion does not take place, it follows that non-satisfaction of the morphological requirements of forms like *pern* does not lead to ungrammaticality.

A similar claim has been made by Abels (2018b), with reference to a class of defective verbs in Russian, such as *buzit* ‘make a fuss’ and *šelestet* ‘rustle’, both of which lack first person singular non-past forms. To illustrate the first, consider the following paradigm showing that there is no existing 1SG form of the verb:

- (19) non-past forms of *buzit* ‘make a fuss’ *Russian*
- | | |
|-----|---------------|
| 1sg | — |
| 2sg | <i>buziš</i> |
| 3sg | <i>buzit</i> |
| 1pl | <i>buzim</i> |
| 2p | <i>buzite</i> |
| 3pl | <i>buzjat</i> |

Despite this defectivity, the first person form can be contained in an ellipsis site. Stripping can be formed with the non-existent first singular form, according to the evidence of (20).

- (20) On buzit, a ja net. *Russian*
 he makes.a.fuss but I not
 ‘He makes a fuss, but me not.’

On the assumption that the second clause contains silent syntactic structure containing the morphosyntactic terminal corresponding to the first singular form of the verb, the well-formedness of the example suggests that no vocabulary insertion was attempted for the verb’s syntactic terminal, and thus the fact that a phonological exponent is missing does not cause

¹¹ The assumption that the ellipsis site contains Greek syntax and vocabulary (the language of the antecedent) is based on the findings of González-Vilbazo and Ramos (2014) about Spanish/German code switching in sluicing. According to these findings, sluicing remnants always carry the case that is assigned by the verb in the language of the antecedent, thus necessitating the assumption that the silent structure in ellipsis is built in the language of the antecedent.

problems.¹² Proponents of non-structural theories of ellipsis might object that facts like the above are also predicted if ellipsis has no syntactic representation, making the non-existence of phonological exponents naturally irrelevant for the well-formedness of ellipsis. This concern can be mitigated when one considers the observation of Mendes and Nevins (to appear), namely that not all types of defectiveness can be salvaged by ellipsis in this way. Non-salvageable defectiveness arises when defectivity goes “deeper” into the grammar, namely when a language lacks a particular syntactic formative entirely, not just a particular phonological exponent for the formative. An illustrative case the authors provide is the English verb *beware*, which can only be used in imperatives or be embedded under modals and command verbs (*Beware of barking dogs!*/*John should beware of barking dogs.* vs. **John bewares of barking dogs.*) This verb can occur in a VP ellipsis site (as in (21a)), but only when in an imperative clause or when embedded under modals/command verbs. In other contexts, ellipsis cannot apply to it (as in (21b)).

- (21) a. They didn’t tell me to beware of barking dogs, but I should <~~beware of barking dogs~~>.
 b. * John should beware of barking dogs but he doesn’t <~~beware of barking dogs~~>.

The author’s explanation for (21b) is that *beware* has a [+irrealis] feature in the lexicon and needs suitable licensing in all its occurrences (this licensing can be done by imperative C or modals/command verbs). The verb *beware* does not exist without this feature; in other words, there is no form of this syntactic terminal that is compatible with a [–irrealis] environment like the elliptical clause in (21b)—the language lacks a formative to use in these syntactic environments. This kind of syntactic defectivity, the lack of a [–irrealis] *beware* in English, cannot be removed by ellipsis. This is fully compatible with the view that ellipsis prevents vocabulary insertion but is incompatible with the view that there is no structure in the ellipsis site to begin with.

The conclusion that ellipsis is sensitive to the availability of morphosyntactic elements, but is insensitive to their actual phonological exponence resonates with the findings of Gribanova (2017b) in another empirical domain, namely the ellipsis-specific identity restriction on verbs that move out of ellipsis sites in Irish. In Irish, the *Verbal Identity Requirement* (VIR), originally stated in Goldberg (2005) in (22) holds very strongly for verbs that move out of an elided constituent (see section 3.2.2 below for more details). This explains why a sentence like (23), featuring two non-identical forms, *cheannaigh* and *dhíol*, is ill-formed (McCloskey 2017).

- (22) *Verbal Identity Requirement* (Goldberg 2005, p. 171: 26)

The antecedent and target-clause main verbs of VP ellipsis must be identical, minimally, in their root and derivational morphology.

- (23) * Níor cheannaigh mé teach ariamh, ach dhíol.
 NEG.PAST buy I house ever but sold
 ‘I never bought a house, but I sold one.’

Gribanova observes that the verbal identity requirement does not in fact extend to cover morphological alternations that are due to root suppletion in Irish. A number of

¹² Abels (2018b) also applies this reasoning to explain why (what looks like) massive wh-pied-piping in English and German can only be found in sluicing-like clausal ellipsis contexts and contain fronting of the wh-phrase. The proposal is that massive wh-pied piping is followed by obligatory ellipsis because a morphosyntactic terminal (a wh-type bound d-pronoun) in the fronting construction lacks a morphological exponent in English and German (see also Kennedy and Merchant 2000 for a similar argument). In a non-elliptical sentence, lack of an insertable item would lead to a morphological crash, but if ellipsis blocks vocabulary insertion, the crash is avoided.

complementizers in Irish trigger suppletive allomorphy on some verbal roots, and verb-stranding ellipsis allows for different allomorphs in the ellipsis clause and the antecedent. This is illustrated in (24), where *deireann* and *abraim* are two distinct allomorphs (the so-called independent and dependent forms) of the verb *say*.

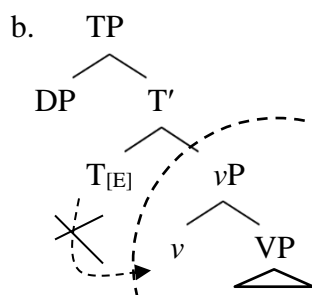
- (24) Deireann tú gur inis mé bréag. Ní abraim.
 say.PRES you C.PAST told I lie C.NEG say.PRES.1SG
 ‘You say that I told a lie. I do not.’

If roots are inserted in PF (the *late insertion* view of roots; see Marantz 1995), and if the calculation of the identity relation in ellipsis is solely based on syntactic information available at LF, the behaviour of Irish is expected: the calculation of the VIR, an ellipsis-specific identity relation in verb-stranding, does not refer to phonological exponence. This is similar to what was discussed in relation to the data in (18)–(20), namely that ellipsis applying to a syntactic formative ignores issues with the exponence of this formative entirely.

The data in this section so far provide arguments for ellipsis as an operation that has the effect of voiding vocabulary insertion. This is compatible with the scenario that ellipsis takes place at the point of vocabulary insertion, but it is also compatible with the scenario that it occurs earlier than vocabulary insertion and bleeds vocabulary insertion as a result. Investigations in the Distributed Morphology framework have also been successful in tearing these two options apart with reference to the interactions of ellipsis with other, independently established morphological operations in the PF branch, specifically with respect to lowering and fusion.

This kind of research was initiated by ideas of Embick and Noyer (2001), who propose that lowering, such as the positioning of tense morphology on the finite verb in English (where T lowers to *v*), strictly only operates on the output of syntax and cannot apply if syntax removes the head to be lowered onto, for example by fronting the *v*P into a position higher than T or by raising T to C in questions. In such cases, where lowering is blocked, *do*-support has to apply. The exact same rescue mechanism that takes care of the stranded T affix also applies when T gets stranded due to ellipsis of the *v*P, see example (25), as suggested by Lasnik (1999b). The stranded tense affix is rescued by the insertion of *do* in this case as well, which straightforwardly indicates that ellipsis precedes lowering.

- (25) a. I went to the cinema and Mary did ~~<go to the cinema>~~, too.



The same idea was used in Saab (2008) and Saab and Lipták (2016) to explain why NP ellipsis in some agglutinative languages results in an unusual position for affixes like the plural affix in Hungarian. While in non-elliptical noun phrases the plural affix (together with case affixes) always attaches to the noun, in elliptical noun phrases it attaches to the linearly last adjectival remnant:

- (26) Mari a régi kis ház-ak-at látta. Én az új nagy-ok-at.
 Mari the old small house-PL-ACC saw I the new big-PL-ACC
 ‘Mari saw the old small houses. I saw the new big (ones).’

As Saab and Lipták point out, this pattern is expected if ellipsis interacts with lowering. The number (and case) affix normally lowers from the Num head to the noun head in non-elliptical phrases. When the noun elides, lowering is blocked, and the affixes are realized via (string-vacuous) local dislocation on the adjacent adjective to the left of the elided noun. A similar proposal is made in Murphy (2018) for the case of German NP ellipsis as well, in an effort to explain why indefinite and possessor pronouns must bear strong inflectional endings in NP ellipsis in this language, inflectional endings that they never bear when they precede an overt noun. Compare the uninflected indefinite in *ein Brief* and its inflected form, *einer*, in example (27):

- (27) Ein Brief is für dich angekommen, und ein-er für mich auch.
 a-Ø letter.MASC is for you arrived and one-MASC.NOM for me too
 ‘A letter arrived for you and one for me too.’

Murphy argues that adjectival inflection, which originates on a functional head, normally attaches to adjectives, or in the absence of adjectives, lowers to the noun head. Nominal ellipsis renders the noun unavailable as a target of lowering, and as a result, adjectival inflection attaches leftward via Local Dislocation to a non-canonical host, namely the indefinite determiner in this case.

If the above conception of English *do*-support and Hungarian, as well as German NP ellipsis is on the right track, we can state that ellipsis removes the environment in which lowering can apply, thereby forcing some affixes too look for a new host. Considering the order of operations in the PF branch (cf. 7 above), this must mean that ellipsis applies before lowering, which in turn means that it either occurs at spell-out or before that, already in narrow syntax.

The very specific interaction of ellipsis observed with respect to lowering is stated as the broader generalization in Saab and Lipták (2016: 77), according to which ellipsis in fact blocks all operations in the PF-branch.

(28) *Ellipsis–Morphology Generalization* (Elmo)

For every morphological operation MO that affects the domain of X, where X contains the target of MO, MO cannot apply in X if X is subject to ellipsis.

In line with this generalization, van Craenenbroeck and Temmerman (2017) finds that ellipsis blocks the morphological operation *fusion* between two syntactic heads (see also Temmerman 2012). The empirical domain in their study concerns the behaviour of negative indefinite objects (such as *no movie*) under VP ellipsis in English. Negative indefinites cannot be anteceded by *any*, unlike their overt equivalent (compare 29B and 29B'), and they cannot scope out of a VP ellipsis site, either, as (30) shows.

(29) [Context: the Cannes Film Festival]

A: Who didn't like any movie?

B: *Quentin Tarantino did <like no movie>.

B': Quentin Tarantino liked no movie.

(30) Q: Who can offer no help?

A: %Quentin Tarantino can <offer no help>. *¬ >◇

The authors claim that (30) is ungrammatical in the reading where negation outscopes the modal ($\neg > \diamond$) for all speakers they consulted (some speakers allow the opposite scope reading, where negation scopes below the modal). The authors' account for these generalizations takes negative indefinites to decompose into two independent elements, sentential negation (a negative polarity head) and an indefinite determiner, which must undergo fusion to be realizable: negation and the indefinite need to fuse in order to get mapped onto the appropriate vocabulary item *no* (fusion takes place under adjacency in a multidominant representation). VP ellipsis eliminates the object and its determiner inside the ellipsis site and bleeds fusion. As the determiner cannot fuse with a negative polarity head outside the ellipsis site, the negative reading is unavailable in (29B) and the high scope reading is unavailable in (30). This analysis yields a neat explanation for the observed data and supports the view that VP ellipsis bleeds morphological operations.

2.3.5 Ellipsis as radical deaccentuation

While normally not classified as a specific type of PF-deletion approach to ellipsis, it is in this section that we mention an important and frequently cited hypothesis that ellipsis involves radical deaccentuation (Tancredi 1992). This refers to the idea that both eliding and deaccenting are operations that reduce redundancy in clauses and ellipsis can only render material unpronounced that is given and would thus be prosodically deaccented.¹³ Evidence for this view comes from the observation that in most intonation languages, deaccentuation is related to marking given material or marking the area that surrounds the focused material (in the sense of Schwarzschild 1999; see also Rooth 1992) such that the prosodic prominence in a clause falls only on the focused part of that clause. Considering that the domain of ellipsis is also given and would be deaccented in many cases if left pronounced, the deaccentuation analysis of givenness carries over to ellipsis and leads to the assumption that deaccenting is a precondition on deletion.¹⁴

The radical deaccentuation view of ellipsis has also been applied more narrowly to define the timing of ellipsis in some works. Chomsky and Lasnik (1993) suggest that ellipsis is an operation that applies to actual phonological content in PF, deleting deaccented material, in what Winkler (2018: 369) cites and refers to as the *phonological reduction hypothesis* in (31).

- (31) Elliptical sentences are formed by a rule of the PF component that deletes the phonologically redundant information that is characterized by a “distinguished low-flat intonation”.
(Chomsky and Lasnik 1993: 564)

This kind of phonological reduction operation in the PF domain has been argued to underlie the formation of right node raising; see Hartmann (2000, 2003) for an extensive investigation. The lateness of the PF operation is signalled by the fact that ellipsis is sensitive to phonological and not syntactic constituency. In complex words, for example, RNR can only eliminate material that minimally forms a phonological word, such as the affix *-achtig* but not *-ig* in Dutch, both of which are adjectivizers (Booij 1985):

- (32) a. (storm)_ω(~~achtig~~)_ω en (regen)_ω(achtig)_ω

¹³ Deaccentuation (see Ladd 1978) refers to the production of phonetic material with low or no pitch accent on constituents that do receive a pitch accent under default conditions. Deaccenting takes place in many languages when given material (material that is already mentioned in the discourse) is repeated.

¹⁴ At the same time, environments in which deaccenting is found are not identical to environments in which ellipsis is found: constraints that apply to deaccenting are a subset of those that apply to ellipsis (e.g. Tancredi 1992, Rooth 1992, Merchant 2001). For alternative approaches, see Fox (2000) and Barros and Kotek (2019).

- strom-ADJ and rain-ADJ
‘stormy and rainy’
- b. * (blauw)_σ(iɛ)_σ en (rod)_σ(ig)_σ
blue-ADJ and red-ADJ
‘bluish and reddish’

Other works that make reference to the above type of phonological reduction in ellipsis are proposals that support the so-called *in-situ* view of ellipsis, such as Abe (2015), Ott and Stuckmeier (2016, 2018), and Kimura and Narita (2021) (see also Den Dikken, Meinunger, and Wilder 2000 for an earlier account of this type). Remnants of clausal ellipsis in these accounts do not undergo movement out of the ellipsis site but are pronounced in their original position, while the elided material is suppressed around the remnant in PF. In some cases, this phonological suppression applies to non-constituents. For the latter reason, suppression is defined in terms of deaccentuation, which is known not to observe syntactic constituency, either. In these authors’ view, the PF component obligatorily assigns given material low-flat intonation (as in (33B), where italics mark deaccentuated material) and can also optionally delete this material, resulting in ellipsis (cf. 33B’).

- (33) A: Who did Mary talk to yesterday?
B: *She talked to John yesterday.*
B’: *She talked to John yesterday.*

It is important to note that the “ellipsis as deaccentuation” view runs into some empirical difficulties when applied wholesale. Ott and Struckmeier (2016) note that in languages in which deaccentuation of given material is not obligatory, deletion of the same material might be a rule independent of deaccentuation.

Indeed, the literature on ellipsis contains references to constituents that can be elided but cannot be deaccented — observe the case of Finnish weakly stressed subject pronouns in (34), which cannot be deaccented, as Holmberg (2001: 172) notes or the case of cataphoric VP ellipsis in (35), which has no deaccented version, mentioned by Kehler (2018)¹⁵:

- (34) A: Onko se käynyt Pariisissa?
has.Q he been Paris.to
‘Has he been to Paris?’
B: On käynyt.
has been
‘Yes.’
B’: * On käynyt *se Pariisissa.*
has been he Paris.to
‘He has been to Paris.’
- (35) [Context: What should we do this afternoon?]
a: * If you are willing to *go to the mall*, I’d like to go to the mall.
b: If you are willing to go to the mall, I’d like to go (to the mall).
c: If you are willing to, I’d like to go to the mall.

¹⁵ It is possible that cataphoric VP ellipsis corresponds to ellipsis of a deep anaphor such as *do it*, as illustrated in (i), which is not deaccentable. We thank James Griffiths (p.c.) for this observation.

(i) If you are willing to <do it>, I’d like to go to the mall.

In these examples, ellipsis cannot be argued to be an operation that targets domains of deaccentuation. Similarly problematic for the definition of ellipsis as a type of deaccentuation are less frequently studied data that are argued to be elliptical in some analysis, such as amalgams (Kluck 2011), identificational appositions (Döring 2015), and constituent-modifying comment clauses (Griffiths 2015). The elided material cannot receive phonological realization with or without deaccenting in these constructions, either.

(36) He left for I think Chicago (**he left for*) last week.

The facts in (34)–(36) suggest that ellipsis is not amenable to an analysis in terms of deleting deaccenting material in all contexts.

2.3.6 Ellipsis as late deletion of phonological content

In addition to coordination-based backward deletion (Wilder 1997, Hartmann 2000), there is yet another phenomenon that has received an analysis in terms of deletion of actual phonological content in the PF-branch: left-edge ellipsis (also called initial material deletion), investigated in Thrasher (1974), Napoli (1982), Wilder (1997), and more recently in Fitzpatrick (2006) and Weir (2012) in English. Instances of this kind of phonological reduction are illustrated in (37) from Napoli (1982) on English and in (38) from De Clercq (2009) on Dutch.

- (37) a. Wish Tom were here. (cf. I wish Tom were here.)
 b. You seen Tom? (cf. ~~Have~~ you seen Tom?)
 c. Good thing you decided to come along!
 (cf. ~~It is a~~ good thing you decided to come along!)
 d. ‘fessor you expected is here. (cf. ~~The pro-~~‘fessor you expected is here.)
- (38) a. Iemand thee? cf. ~~Wil~~—~~er~~ iemand thee? Dutch
 someone tea want.3SG ER someone tea
 ‘Would someone like tea?’
 b. Jij een koekje? cf. ~~Wil~~ jij een koekje?
 you a biscuit want.2SG you a biscuit
 ‘Would you like a biscuit?’

As these examples show, left edge ellipsis always targets an initial word, syllable or a continuous string of words in an informal utterance. As Napoli (1982) and Weir (2012) have argued, this kind of deletion has a specific prosodic profile that is distinct from the types of ellipsis constructions we reviewed this far. First, unlike unambiguous cases of NP, VP, or TP ellipsis, which are argued to delete syntactic constituents and appear to need syntactic licensing, this operation deletes phonological constituents and needs no syntactic licensing of any sort. Second, left edge deletion is sensitive to phonological content and not to syntactic content: the deleted syllable or word(s) must precede the first accent of the utterance, that is, deletion is sensitive to stress placement. Third, the motivation of deletion is prosodic in nature: it satisfies the need for prosodic constituents to start with a prosodically strong element, see Weir (2012, this volume) for arguments to this effect. These features of left-edge ellipsis highlight the phonological nature of the deletion operation, which must take place as late as accent placement and prosodic constituency formation.

In addition to the above, Zwicky and Pullum (1983) adduce other convincing arguments for the phonological nature of this deletion, observing for example its interaction with allomorph selection. Sentences such as (39) show that the initial fricative of the auxiliary is dependent on the voicing of a deleted word, in this case the subject pronoun. As the deleted subject pronoun

conditions the morphophonemic rule of voicing assimilation on the overt auxiliary, it must be the case that deletion applies after voicing assimilation.

- (39) a. ~~It~~'s really cold in here. realized as: /srili .../
 b. ~~There~~'s really no hope. realized as: /zrili .../

This evidence that initial material deletion must correspond to deletion of actual phonological content, following vocabulary insertion (in models that assume such an operation) and morphophonemic processes, and that it occurs late in the PF-branch.

PF-deletion that is insensitive to syntactic constituency has also been argued to be possible in diverse elliptical configurations in Korean or Japanese, under the name *extra deletion*, see An (2016, 2019). A fragment answer exhibiting this kind of deletion is illustrated in (40), from Korean. In this example, pronunciation of the nominative marker on the fragment is optional.

- (40) Q: Nwu-ka John-ul manna-ss-ni? (An 2019: 338)
 who-NOM John-ACC meet-PAST-Q
 ‘Who met John?’
 A: Cho-(ka).
 Cho-NOM
 ‘Cho (met John).’

When the fragment appears without the nominative marker, it undergoes PF-deletion that applies to the nominative marker only. An argues that the deletion of the case marker follows linearization and has a curious condition on it: the elided case marker must be adjacent to an elided constituent, such as a TP. Erschler (this volume) presents data reminiscent of the above in Turkish, Ossetic, and Eastern Armenian in another syntactic domain, namely gapping, and puts forward the claim that gapping contexts in these languages can feature a kind of deletion that is a late PF-process.

2.4 Ellipsis in narrow syntax: Derivational ellipsis

The term “derivational ellipsis” was coined by Aelbrecht (2010) for the view that ellipsis is implemented in narrow syntax and that as such it is not merely a matter of PF realization. Derivational ellipsis proposals focus on the effect of ellipsis on extraction phenomena and explain it with reference to deletion of formal features in narrow syntax and/or the claim that the ellipsis operation freezes (makes inaccessible for the rest of the derivation) the elided constituent.

The first derivational type of approach to ellipsis is Baltin (2007, 2012). In Baltin’s works, deletion of a constituent takes place in the syntax when this constituent merges with another node and has the effect of deleting formal features as well as rendering the entire deleted category inaccessible. Deletion of formal features automatically entails the absence of vocabulary insertion, where the latter is viewed as a pairing between formal features and their phonological exponents. Baltin’s theory of early ellipsis is based on empirical observations about ellipsis accompanying British English *do*, a type of ellipsis that differs from ordinary VP ellipsis, but also from ordinary VP anaphora (such as *do it* or *do so*): it shows an extraction profile that is distinct from both. According to Baltin, *wh*-movement is barred out of *do*-ellipsis in general, as illustrated for object extraction in (41).

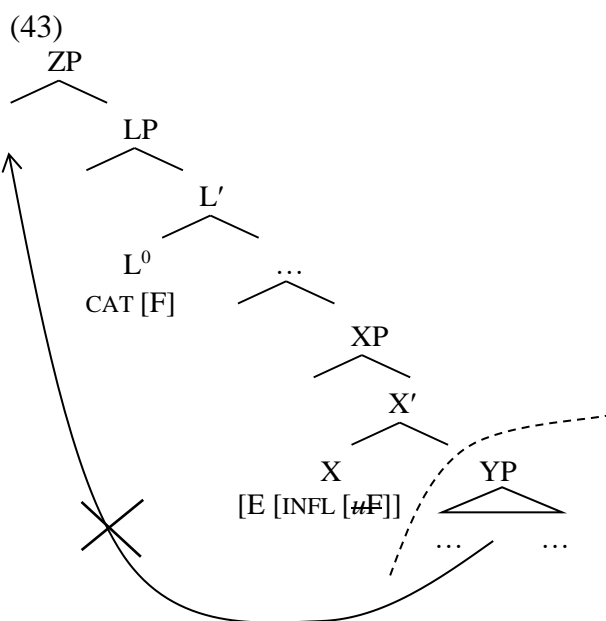
- (41) * Although we don’t know what John might read, we do know what Fred might do.

If the elidable category (the VP in Baltin’s analysis) elides and becomes inaccessible as soon as it merges with *do*, the *wh*-phrase *what* is trapped inside it and cannot move to a higher position. The same argument is made about the lack of inverse scope in these contexts (see (42)): if the VP, with the object in it, is deleted in the syntax, the object cannot undergo movement at LF.

- (42) Some man will read every book and some woman will do, too.
 [some > every; * every > some]

It is important to point out that some of Baltin’s empirical observations have been found to be inaccurate. Abels (2012) and Thoms and Sailor (2018) pointed out that while *wh*-extraction out of *do*-ellipsis is barred, some types of A-bar movement, such as topicalization or relativization is possible. See Den Dikken and Griffiths (this volume) for observations of this type and novel arguments against Baltin’s account.

A highly influential variant of the derivational approach to ellipsis is Aelbrecht (2010), which combines the virtues of the derivational view with the [E]-feature based theory of ellipsis licensing. Studying extraction asymmetries in Dutch modal complement ellipsis and British English *do* contexts, Aelbrecht concludes that ellipsis occurs in narrow syntax at the point when the ellipsis-triggering feature *Agrees* with a licenser head. Reason for this is that the ellipsis-triggering feature ([E]) is not necessarily situated on the licensing head and when this is the case, the licensing head needs to undergo feature checking with an (inflectional) feature of [E] in its c-command domain. Consider for illustration the situation in (43), from Aelbrecht (2010: 107). L is the licensing head and X stands for the head whose complement elides. As soon as licensing between the licenser L and the ellipsis-triggering feature on X is accomplished via *Agree* (this results in the checking of the uF feature on X), the ellipsis site (indicated by a dashed line) is sent to PF.



Ellipsis has two effects: on the one hand, it freezes the ellipsis site for further syntactic operations, with the result that extraction (represented by the arrow in (43)) cannot take place out of it. On the other hand, ellipsis marks the elided material so that lexical insertion is blocked in it. The first of these two effects has the result that ellipsis bleeds movement in examples like (41) and (42) above, the latter with reference to overt movement deriving inverse scope (i.e.

movement of the scope taking item in the syntax and pronunciation of its lower copy, Bobaljik 2002). A novelty of Aelbrecht’s approach is that it ties the application of ellipsis to the licensing of ellipsis, identifying the two as co-existential.

While Baltin (2007, 2012) and Aelbrecht (2010) were developed to capture the interaction between ellipsis and phrasal movement, Sailor (2018) argues that Aelbrecht’s derivational account can also capture the interaction between ellipsis and head movement in some languages. He shows that Aelbrecht’s system correctly rules out head movement out of an ellipsis site when the ellipsis triggering/licensing feature (itself not attracting the head) is merged in the structure *earlier* than the feature that attracts head movement to a higher head, and in cases where head movement is syntactic.

This explains the curious absence of V-stranding VP ellipsis in Mainland Scandinavian languages. These languages have V-to-C movement (resulting in V2 order) and they also have auxiliary-stranding VP ellipsis (as in (44a)). What they lack is a form of ellipsis that strands a finite lexical verb—the kind that Irish exhibits (see example (24) above). This is shown in example (44b).

- (44) a. Johan har inte läst Lolita, men Kalle har. *Swedish* (Sailor 2018: 855)
 Johan has not read Lolita but Kalle has
 ‘Johan hasn’t read Lolita, but Kalle has.’
 b. * Johan läste inte Lolita, men Kalle läste.
 Johan read.PAST not Lolita but Kalle read.PAST
 ‘Johan didn’t read Lolita, but Kalle did.’

Sailor argues that the lack of the latter pattern is due to the derivational timing of ellipsis. In Mainland Scandinavian, the head that triggers VPE, T_[E], is merged earlier than the C head that triggers verb movement from V to C. At the point when T_[E] merges, ellipsis applies, and the ellipsis site is sent to PF. As a result, at the point when C merges into the structure and triggers V2, the lexical verb inside the VP is no longer available for further movement.

- (45) ...[_{CP} Kalle C [_{TP} T_[E] {_{VP} läste-}]] (cf. 44b)
- 

The feature of Mainland Scandinavian verb movement that plays a key role here is that T itself can be shown not to trigger verb movement to it (see Vikner 1995 and Sailor 2018 for evidence).

Should T be a trigger of verb movement as well, the expectation is that V-stranding ellipsis in V2 contexts is possible. This prediction is borne out in another V2 language, Kashmiri, as argued by Manetta (2020). Kashmiri has V2 in both main and embedded clauses, and this language has both auxiliary stranding VP ellipsis (as in (46a)) and verb-stranding ellipsis (as in (46b)).

- (46) a. Təm cha ciTh’ liichmIts ganT-as. Kabir ti cha.
 3SG AUX.PST letter write.PSP hour-for Kabir also AUX.PST
 ‘He wrote a letter for an hour.’ ‘Kabir did also (write a letter for an hour).’
 b. tsI dikh pagaah təmis kitaab. Kabir ti di-yi.
 2sg give.FUT tomorrow him.DAT book Kabir also give-FUT
 ‘You will give him a book tomorrow’ ‘Kabir will also give (him a book then).’

According to Manetta’s analysis, the finite auxiliary and the finite verb in Kashmiri is always in C (as a result of V2) and the data in (46) are cases of *vP*-ellipsis, which is specifically triggered by an [E] feature on T. Unlike in Mainland Scandinavian, not only does the T head

license the ellipsis of its complement, it also acts as a trigger of verb movement to it. Assuming that ellipsis licensing and the triggering of verb movement are co-temporal (both can proceed on a given head), this account locates the difference between Kashmiri and Mainland Scandinavian in the feature content of their T head and explains the availability of ellipsis in terms of derivational timing.

As the above overview shows, derivational ellipsis approaches hold the view that ellipsis occurs in the course of the derivation and thus interacts with narrow syntactic operations in specific ways. If these accounts are correct, derivational ellipsis approaches are essential for methodological reasons as well, as they show that the absence of extraction can no longer be taken to be a diagnostic for the absence of syntactic structure inside an ellipsis site. If ellipsis is syntactic, syntactic structure can be present, but movement is nevertheless still blocked if the target of movement is situated above the ellipsis-licensing head and there is no landing site or escape hatch (i.e. a phase edge) between the elided constituent and the licensing head.

The same methodological remark applies to construing arguments on the basis of ellipsis about other phenomena, such as the existence of head movement in a given syntactic context. The purpose of the investigation of Mainland Scandinavian V2 under ellipsis in Sailor (2018) was methodologically oriented in exactly this way: Sailor used the findings to criticize the condition in (47), put forward in Lipták and Saab (2014).

- (47) A language has X-stranding XP ellipsis iff: (Lipták and Saab 2014: 1251)
- (i) the language has XP-ellipsis and
 - (ii) the language has X-raising out of XP.

Lipták and Saab used the preconditions (i) and (ii) listed in (47) to develop a diagnostic for head movement out of a given phrase, on the basis of the existence of verb-stranding ellipsis eliding the same phrase. They argued that the *absence* of head-movement can be positively established for a language if that language has XP ellipsis, but does not have head-stranding ellipsis of the same XP constituent. Sailor (2018) argued that the lack of head-movement out of an elided phrase cannot be taken as diagnostic evidence for the lack of head movement out of this phrase in non-elliptical contexts, as this movement could be blocked due to the derivational timing of ellipsis. Head movement out of an ellipsis site is possible if satisfaction of a head-movement-triggering feature is derivationally prior to or co-temporal with the satisfaction of the ellipsis triggering feature, but is blocked otherwise. Sailor’s formulation of the preconditions is in (48) (note that $[X^*]$ is a strong feature that attracts category X).

- (48) A language has X-stranding XP ellipsis iff: (Sailor 2018: 865)
- (i) L has X-movement out of XP triggered by a feature $[X^*]$ on a head α ;
 - (ii) L has XP-ellipsis triggered by merger of a head β bearing $[E]$; and,
 - (iii) Satisfaction of $[X^*]$ on α is derivationally prior to merger of β , or $\alpha = \beta$.

Before closing this section, it is important to comment on the relationship between derivational ellipsis approaches and phase-based approaches to ellipsis that treat ellipsis as a case of null spell-out, reviewed above in Section 2.3.2. The derivational view of ellipsis has been quite influential in recent years exactly because it provides a way for the theorist to unify ellipsis with ordinary spell-out—a welcome result, if unification is indeed possible. The similarity between the two types of approaches is evident: phase-based accounts treat ellipsis as a case of spell-out, and claim that, since only phase heads can determine points of transfer to PF, it is also phase heads that trigger PF-non-pronunciation of their phasal domain. In phase-based accounts, ellipsis is triggered as part of the syntactic derivation, but in ways that are no different from ordinary cyclic spell-out and with results similar to spell-out, namely syntactic

inaccessibility and the fact that the syntactic units that can be targeted by deletion are non-distinct from those units that are sent to PF. This view can provide an elegant account for some types of ellipsis, with TP ellipsis, VP ellipsis, and NP ellipsis being the prime examples for this type.

Nevertheless, phase-based accounts also face some challenges, such as the treatment of the successive cyclic nature of ellipsis, the possibilities for extraction out of ellipsis sites and ellipsis licensing. We discuss them in turn.

The challenge raised by the successive cyclic nature of ellipsis is what the technical implementation of the cyclic nature of ellipsis should be, as Müller (2011) pointed out. If ellipsis is phase-based, elided constituents comprising more than one spell-out domain need to be implemented phase-by-phase and successive cyclically. Consider sluicing, which is standardly assumed to be TP ellipsis, triggered by the C head. Phase-based accounts need to endow the lower phase head, v , with the same ellipsis-triggering capacity. Otherwise, v 's complement, the VP, can only spell out with the instruction that the VP be phonologically realized—something that never happens in sluicing, of course. The same would apply to VP-ellipsis containing a clausal complement of the verb, in which the clausal complement contains spell-out domains on its own, which must all spell out as null for the sentence to be grammatical. The phase-based model therefore needs to implement a special operation that has the effect of “silencing all the way down”, such that a higher spell-out operation necessarily silences the output of all lower spell-out operations. Murphy and Müller (this volume) propose a technical implementation that does exactly this.

The second issue for phase-based accounts is whether they predict the possibility of extraction correctly in all cases. Aelbrecht (2010) is of the opinion that ellipsis cannot be ordinary cyclic spell-out, as this would predict that extraction possibilities in ellipsis and non-ellipsis should be the same, contrary to observations in some domains: the non-elliptical versions of (41) and (42) above allow for object extraction and inverse scope, unlike their elliptical versions, which do not. To address this question, Bošković (2014) proposes a dynamic approach to phases which is flexible when it comes to ellipsis. This work defines ellipsis as sending either the entire phase or the complement of the phase head to PF. According to Bošković, A-bar extraction out of an ellipsis site correlates with this choice and is only possible in the latter case. If ellipsis corresponds to spell-out of a full phrase (as is the case of argument ellipsis), extraction from the ellipsis site is blocked. While the data clearly require an approach that exhibits flexibility of this type, it is less clear where the required flexibility follows from and whether it does not fly in the face of the original idea that ellipsis and ordinary spell-out are the same operations.

In addition, whichever way we define the domains of structure that can receive null spell-out, phase-based approaches do not readily make correct predictions about the cross-linguistic availability of ellipsis in all languages, the issue of ellipsis *licensing*, which is the third challenge for phase-based accounts. First, phase-based accounts do not always make correct predictions about the kinds of syntactic domains that can be elided, as we have mentioned already. To wit, VP ellipsis is quite rare cross-linguistically: the v phase head does not license ellipsis of its VP complement in Dutch, French, Japanese, or Kiswahili, to name a few languages (van Craenenbroeck and Temmerman 2018). This suggests that phase heads cannot per definition be ellipsis licensors, suggesting that the [E]-feature is not intrinsic to phase-heads (Gallego 2009). A better formulation would be to say that an [E]-feature can only occur on a phase head, if at all (van Craenenbroeck 2010b: 248, 291). Second, some elided constituents do not correspond to a phase complement: AspP (sandwiched between TP and VoiceP) is elided in Dutch modal complement ellipsis, v P can be deleted in English predicate ellipsis or pseudogapping (Merchant 2013b), CP can be elided in what looks like sluicing with apparent massive pied-piping (Abels 2018b), and an elided NP does not need to correspond to a phase

complement in nominal constituents where functional projections like NumP intervene between D and NP (Saab 2018). It is unclear if there are compelling arguments to define these elidable phrases as spell-out domains in the respective languages. Third, if Aelbrecht (2010) is right, standard and elliptical spell-out differ in that ellipsis in certain cases needs a specific licenser above the ellipsis-triggering head (like finite T in the case of VP ellipsis in English in her view), while standard spell-out does not need a specific licensing head.¹⁶

With this said, we must also admit right away that derivational ellipsis accounts and phase-based approaches to ellipsis are not the only proposals that have a hard time providing an answer to the question of how ellipsis licensing should be defined. An overarching theory of ellipsis licensing is not yet in view, as opinions greatly differ on what counts as a licenser. A licenser has been defined variably as a head showing strong agreement and governing the ellipsis site (Lobeck 1995), comprising T/Infl as a licenser of VP ellipsis (Bresnan 1976, Sag 1976b/1980, Zagana 1988); a head that is overt (for VP ellipsis in Postdam 1997, VP ellipsis and NP ellipsis in Conner 2015); a head that is overt and appears in its phonetic realization as non-contracted (King 1970, Takahashi 2004); a head that has a specifier (Richards 2003); a head that engages in Spec–Head agreement (Saito and Murasugi 1990); a construction-specific [E] feature (Merchant 2001 and many others); a head *Agreeing* with a construction-specific [E] feature (Aelbrecht 2010, Landau 2020b); A-bar movement or head-movement (Thoms 2010). Of these accounts, Griffiths and Den Dikken (this volume) revive the proposal that ellipsis is licensed by a head that engages in Spec–Head agreement, with reference to a host of novel data from English involving Unusual Subjects.

It is similarly unclear if licensing actually determines the timing of ellipsis if some of the above definitions are correct. While Aelbrecht (2010) assumes it does, accounts that rely on the overtness and a particular realization of the licensing head (King 1970, Postdam 1997, Takahashi 2004, Conner 2015) are incompatible with Aelbrecht’s view of derivational ellipsis. As the information that a given head is overt or covert, contracted or non-contracted is phonological in nature, it is only available in PF, and is thus only compatible with the view that ellipsis takes place in PF. Most likely, however, statements of this sort are not describing syntactic licensing conditions but capture external condition on the realization of elliptical sentences. It is therefore imperative for future research to see how much of what is currently stated as syntactic licensing conditions might be ascribed to external factors, such as PF requirements for the formation of remnants. As Güneş and Lipták (2021) show, languages sometimes pose prosodic requirements for elliptical remnants, which in turn impacts the distribution of certain lexical items in elliptical clauses. See also Bennet et al. (2019) and Section 3.2.4 for other aspects of the prosodic realization of ellipsis remnants.

3. The derivational timing of ellipsis: what evidence do we have?

Having surveyed the different views on PF-non-realization and the timing of ellipsis during or after syntax, this section provides an overview of the types of evidence that could potentially be used to establish the derivational timing of ellipsis.

¹⁶ See Aelbrecht (2016) for an attempt to eliminate this difference. Aelbrecht suggests that standard spell-out can be made similar to ellipsis in this respect, when defined along the lines of the revised PIC condition in Chomsky (2001) (i.e. spell-out domain of a phrase head only becomes inaccessible when the next phase head is merged). Accordingly, there is a need for a higher head—the higher phase head—to implement Transfer to PF in standard spell-out as well.

3.1 The constituency of the elided material

One type of evidence that can be used to time ellipsis concerns the constituency of what gets elided, primarily the question of whether the elided chunk forms a single syntactic constituent or a prosodic one. If ellipsis observes syntactic constituency, the most reasonable assumption to make is that ellipsis is sensitive to syntactic content and is thus triggered at a point when structure is still accessible. That in turn can mean that it takes place in narrow syntax, or in the PF-branch before linearization and vocabulary insertion.¹⁷ If the elided chunk does not form a syntactic constituent, but rather a prosodic one, ellipsis must happen later: after syntactic structure has been converted to prosodic structure.

As we have shown in Section 2.3.6, left-edge ellipsis, illustrated for convenience in (49), is clearly a type of omission that elides a prosodic constituent, rather than a syntactic one, as the fronted auxiliary and the subject do not form a constituent of the clause.

(49) ~~Have you~~ seen this film yet?

In line with this and other observations, Napoli (1982) and Weir (2012) take left-edge ellipsis to be a late postsyntactic process, after prosodic constituency formation and morphophonological processes. Weir (this volume) argues that, in addition to left-edge ellipsis, fragments are also formed at the interface with prosody.

On the other hand, canonical non-coordinate ellipsis, such as clausal ellipsis, predicate ellipsis, and NP ellipsis are standardly taken to involve omission of a single syntactic constituent. Pseudogapping (Jayaseelan 1990, Lasnik 1999c), stripping (Sag 1976b/1980, Depiante 2000), and ellipsis in a non-initial conjunct in coordinative structures, such as gapping (Johnson 2018) and apparent non-constituent coordination (Sailor and Thoms 2014), have been argued to correspond to ellipsis of a syntactic constituent, too. If this is correct, ellipsis in these cases must be triggered in the syntax or early on in the PF branch when structure is still accessible, a conclusion that is supported by Sailor (this volume).

Some accounts of ellipsis call into question the syntactic constituency of canonical ellipsis processes. These argue against move-and-delete approaches to clausal ellipsis and implement an in-situ approach instead, where ellipsis targets non-constituents in the syntax (Abe 2015, Ott and Struckmeier 2018). Ott and Struckmeier (2018) uses the distribution of clause-internal modal particles like *denn* in German to support such a claim. These particles are syntactically immobile in German, and they do not form a constituent with the phrase that precedes them in a fragment answer either. Their presence in a fragment answer like (50B) can therefore only be derived from an underlying sentence like (51b), by applying omission in more than one position in the clause.

(50) A: Peter invited a couple of people.

B: WEN *denn*?
who MP (=modal particle)
'Who?'

(51) a. * [WEN *denn*] hat er eingeladen?

who MP has he invited

b. WEN ~~hat Peter~~ *denn eingeladen*?
who.ACC has Peter then invited

¹⁷ Alternatively, we cannot exclude the possibility that ellipsis targets not a syntactic constituent, but a representation that itself faithfully maps syntactic constituency (e.g. a phonological representation that is faithful to syntactic constituency).

‘Who has Peter invited?’

These authors propose that the elided material does not form a syntactic constituent but gets omitted via phonological reduction, which eliminates material with a specific deaccentuated intonational profile in-situ (see Section 2.3.6 above).

3.2 Interaction of ellipsis with other operations: Feeding and bleeding

Another type of evidence for the derivational timing of ellipsis comes from observations about the interaction of ellipsis with other processes: does ellipsis feed or bleed other operations in the grammar? In this section, we review what kind of operations have been linked to ellipsis in this way. We review the movement of phrases and heads, as well as agreement and cliticization across ellipsis sites. This discussion complements Section 2.3.4 above, which concentrated on diagnostics based on the interaction of ellipsis with morphological operations.

3.2.1 Phrasal movement

Overt movement, both A and A-bar movement, is typically unaffected by ellipsis (Hornstein 1994, Merchant 2001, 2004, Shen 2017). LF-movement/QR similarly proceeds unhampered: it feeds ellipsis resolution in ACD-constructions (May 1985, but see Hornstein 1994 for deriving the same facts via A-movement). These facts are illustrated in (52a–c), with reference to VP ellipsis in English:

- (52) *A-movement*
a. This car has been fixed, and that one hasn't < been fixed t >
A-bar movement
b. He told me which book he has read and which book he hasn't < read t >
Quantifier raising
c. John has read every book that I have < read t >

Such data are usually taken as evidence that ellipsis does not impede structure building and movement, which entails that it cannot apply during narrow syntax, early on in the derivation. In derivational approaches to ellipsis on the other hand, extraction in these configurations is argued to be unimpeded due to the fact that movement out of the ellipsis site is triggered (by an attracting head or a phase head) before the ellipsis licensing operation takes place (Aelbrecht 2010).

Exceptions to unhindered A-bar extraction out of ellipsis sites have been mentioned in Section 2.4 above, concerning ellipsis with British English *do* (see (41) and (42)). Dutch modal complement ellipsis is also constrained in this respect. Subject A- and A-bar movement is possible, as shown in (53a), but A-bar movement of objects or low adjuncts is blocked, as illustrated in (53b).

- (53) a. Die broek MOET nog niet gewassen worden, maar hij MAG
those pants must still not washed become but he may
al wel. (Aelbrecht 2010: 60)
already PRT
‘Those pants don't have to be washed yet, but they can be.’
b. ?* Ik weet niet wie Kaat wou uitnodigen, maar ik weet wel
I know not who Kaat want.PST invite.INF but I know PRT
wie ze MOEST. (Aelbrecht 2010: 66)
who she must.PST

‘I don’t know who Kaat WANTED to invite, but I do know who she HAD to.’

These facts have been the cornerstone of the derivational ellipsis accounts, where ellipsis occurs in narrow syntax and has the result of freezing the ellipsis site for further computation. This predicts that in some configurations, extraction out of an ellipsis site is impossible.

There is a special type of movement that needs to be mentioned specifically with respect to the bleeding effect of ellipsis, and that is EPP-driven movement. This kind of movement has been argued to be suspended under ellipsis, as van Craenenbroeck and Den Dikken (2006) have shown, following a similar claim for movement to subject position in Merchant (2001) and more recently, Griffiths et al. (to appear). Pinpointing the exact time of ellipsis is difficult with respect to the EPP alone, as the nature of the EPP is notoriously difficult to define. In some approaches (Chomsky 1982, 1995a, 2000, Alexiadou and Anagnostopoulou 1998) EPP is a purely syntactic phenomenon. In other approaches it is argued to be a PF-condition that requires that certain positions be filled (Holmberg 2000, Bobaljik 2002, Landau 2007a). Therefore, the blocking effect of ellipsis on EPP movement is compatible with the view that EPP is a PF condition, but it is also compatible with the view that EPP is syntactic and so is ellipsis.

3.2.2 Head movement

Ellipsis also shows specific and curious interactions with head movement, as both feeding and bleeding effects are attested. The interaction of ellipsis and head movement constitutes a well-studied and debated area.

We know of certain types of heads whose movement is bled by ellipsis—the observation we already made in connection with English clausal ellipsis, which is incompatible with T-to-C movement; see (6) above (see also van Craenenbroeck and Lipták 2008 for comparable facts in Hungarian). As we mentioned there, facts of this sort have received an account in terms of derivational timing of the movement operation: Boeckx and Stepanović (2001) proposed that T-to-C head movement is PF movement and that ellipsis bleeds the application of head movement, an explanation that runs into problems when it comes to the scopal behaviour of this movement (Landau 2020a).

The bleeding effect of ellipsis on head movement is not universal, however. Heads can and in fact must move out of ellipsis sites in other constructions in English (see Thoms 2010, Sailor 2014 on VP ellipsis) and in other languages as well. Cross-linguistically, *verb-stranding* ellipsis phenomena have been attested in many languages, which include genetically related and unrelated languages, such as Irish (McCloskey 1991, 2011), Chinese (Otani and Whitman 1991), Swahili (Ngonyani 1996), Finnish (Holmberg 2001, 2015), Hungarian (Lipták 2012, 2013), (Brazilian) Portuguese (Martins 1994, Cyrino and Matos 2002, Santos 2009, Mendes 2020) and Russian (Gribanova 2013b, 2017a, 2018), Greek (Merchant 2018b), and Hindi-Urdu (Manetta 2019) to name a few, languages in which verb movement in the clause is independently attested.

In the verb-stranding type of elliptical construction, movement lifts the verb into a functional position above some domain (YP in (54)), and subsequently elides this domain.

(54) *V-stranding ellipsis, general structure*

[_{XP} verb_i [_{YP} —*t_i*—]]

The syntactic category of YP, as well as the XP whose head is targeted by verb movement, can vary across languages and constructions; XP can stand for *vP*, *AspP*, *TP*, *PolP*, or *CP* among others. (55) illustrates the last type (movement to C⁰) from Finnish (Holmberg 2001, ex. 1). This elliptical pattern is called a *verb-echo answer* in Holmberg (2015), as the verb serves as the affirmative answer to a polar question and “echoes” the verb in the antecedent question.

- (55) A: On-ko Liisa kotona? Finnish
 is-Q Liisa at.home
 ‘Is Liisa at home?’
 B: On.
 is
 ‘Yes.’
 B’: [CP On [TP Liisa t kotona]]

Diagnosing verb-stranding ellipsis is particularly hard, as one must rule out the option that the missing material is independently omitted in some other process that eliminates constituents of smaller sizes, such as *pro*-drop or argument ellipsis. In languages that possess such independent omission phenomena, verb-stranding ellipsis therefore needs to be established in environments in which such omissions cannot apply. An additional methodological difficulty in these languages is that the judgement on smaller or larger ellipses is often influenced by prosodic or pragmatic choices that are still not fully understood and thus are difficult to control for when consulting native speakers (Merchant 2018b, Gribanova 2020). Due to these reasons, the right toolbox for the detection of verb-stranding phenomena is still under discussion (Simpson et al. 2013, Funakoshi 2016, Landau 2018, Han et al. 2020).

On the basis of empirical considerations, Landau (2018, 2020b,c) calls into question whether the verb can raise to any functional category and across any syntactic domain in an unconstrained manner in verb-stranding constructions. Landau argues that verb-stranding VP ellipsis configurations and auxiliary-stranding TP ellipsis configurations do not exist (or when they appear to exist, they have been misanalysed as such in previous works). At the same time, Landau (2020b) reaffirms that verb-echo answers (as in (55)) or comparable expressions of polarity emphasis are existing instances of verb-stranding ellipsis, which are derived by verb movement to a polarity-related position, such as Pol⁰ or C⁰. To capture the difference between the existing and non-existing patterns, he suggests that the bleeding or feeding effect of ellipsis on head movement is systematic and rule-governed across languages and can be stated as the generalization in (56).

(56) *Constraint on Head-Stranding Ellipsis*

If X-movement crosses a spell-out domain, XP cannot be the target of ellipsis.

Landau (2020b) also argues that (56) follows specifically from the mechanism of PF-deletion. To derive it, Landau implements a view of PF-deletion in which overtness of the head whose projection is targeted by ellipsis plays a role. A precondition on ellipsis is that this head needs to be PF-visible—that is, overt—in order to effect the PF-process. Since a trace left by head movement is not PF-visible in this sense, head movement out of the phrase targeted by ellipsis is ill-formed.¹⁸

In addition to the variability of the empirical evidence and questions about the existence of certain types of verb-stranding ellipses, gaining a proper understanding of the interaction between head movement and ellipsis is also hampered by the curious *Verbal Identity*

¹⁸ Landau adopts Aelbrecht’s (2010) proposal that ellipsis of an XP needs to be licensed by a higher head, but he also modifies Aelbrecht’s system by positing that the [E] feature is located not on the head that selects XP but on the head X of the elided XP constituent. In Landau’s model, the [E] feature instructs PF not to spell out the maximal projection headed by [E]’s host. [E]’s host must be PF-visible in the spell-out domain to effect the PF-process we call ellipsis.

Requirement (VIC)—recall (22) above— according to which the antecedent and the target-clause verbs must be identical minimally in their root and derivational morphology. This requirement does not follow from the constraint in (56) and presents the theorist with a puzzle.

According to our current understanding there are a handful of languages where this requirement needs to be satisfied by all verbs, contrastive or non-contrastive alike. These are Irish (see ex. 23 above and McCloskey 2017) and Scottish Gaelic (Thoms 2016, 2018b), both Goidelic languages, and the unrelated Uzbek, a Turkic language (Gribanova 2020). In other languages that have been studied in this respect, the requirement needs to be satisfied only by non-contrastive verbs, while contrastively focused verbs are free to violate it, as illustrated in (57) in Russian (Gribanova 2013b, 2017a).

- (57) Kto-to ètu vazu URONIL, i tot fakt, što nikto (eë) ne PODNJAL,
 someone this.a vase.a dropped and the fact that nobody it not picked.up
 menja ogorčæet. (Gribanova 2013b: 119)
 me upsets
 ‘Someone DROPPED this vase, and the fact that no one PICKED (it) up upsets me.’

As A- and A-bar extraction out of ellipsis sites do not have to satisfy a lexical identity condition of any sort, the existence of the VIC is mysterious. It is especially mysterious under the view that head movement is syntactic and leaves behind traces, just like phrasal movement, because if this is the case, we do not expect head and phrasal movement to differ with respect to the calculation of identity under ellipsis.

Assuming that head movement is postsyntactic however, opens up some possibilities.¹⁹ With this assumption, Schoorlemmer and Temmerman (2012), present an explanation for the VIC in Irish-type languages in terms of the derivational timing of ellipsis. They propose that the verb moves out of the ellipsis site in PF, consequently, in LF, when semantic/lexical identity is calculated, the verb is inside the ellipsis site and thus has to be given. More recently, Gribanova (2018, see also Gribanova 2020) suggests that a proposal along these lines also holds promise for a better understanding of the VIC across the two groups of languages identified above: those that can relax the VIC for contrastive verbs and those that cannot. Based on Harizanov and Gribanova (2019), a study differentiating between syntactic and postsyntactic head movement, Gribanova proposes that the difference between the two sets of languages derives from the differing nature of head movement. In languages where verb movement is postsyntactic (as is the case in Irish, Scottish, and Uzbek), the verb is inside the ellipsis site at the point when ellipsis is licensed and identity calculations are done. In languages where verb movement is syntactic, the verb is allowed to escape the ellipsis site before the calculation of ellipsis identity, allowing mismatches to arise under certain discourse conditions.

As this section has shown, the interaction between ellipsis and head movement is a dynamic and exciting field of research, one that is confounded by the cross-linguistic diversity of the phenomena and the VIC condition. The results of this field of studies, however, directly inform us about the timing of ellipsis, with repercussions about the proper understanding of head movement as well.

3.2.3 Agreement

Agreement between two elements, one outside and one inside the ellipsis site is in many cases unaffected by ellipsis and takes place just as in non-elliptical sentences. It is known that the postverbal subject in English *there*-expletive constructions, which controls agreement with the

¹⁹ It is important to note, however, that the idea that PF-movement can take place out of an ellipsis site conflicts with the view that ellipsis should be defined as vocabulary non-insertion.

finite verb, does so obligatorily from inside an elided VP as well (Ross 1969). The data in (58) are from van Craenenbroeck (2017):

- (58) a. I didn't think there would be a jazz pianist at Mr. Gatsby's party, but there was/*were
 < a jazz pianist at the party >.
 b. I didn't think there would be jazz pianists at Mr. Gatsby's party, but there *was/were
 < jazz pianists at the party >.

Furthermore, agreement is not only possible, but is also crucial for some types of ellipsis, as agreement has been identified as a licenser of ellipsis, see Lobeck (1995). A particularly clear demonstration of this effect comes from NP ellipsis in some languages. In German, the adjectival remnant of NP ellipsis must show overt inflection, which is the reflection of agreement with the noun, even in cases where such inflection is optional in non-elliptical noun phrases; see the data in (59) (Muysken and van Riemsdijk 1986).²⁰

- (59) a. ein lila/linanes Kleid
 a lila/lila.SG.NEUT.NOM dress.NEUT
 'a purple dress'
 b. ein lila*(nes) ~~Kleid~~
 a lila.SG.NEUT.NOM dress.NEUT
 'a purple one'

At the same time, Johnson (2015a,b) argues that Hocąk, a Siouan language, exhibits VP ellipsis of a certain type that lacks the otherwise obligatory object agreement on the verbal element; that is, ellipsis bleeds object agreement. In this language, there is obligatory object agreement with certain predicates (see (60a)). Such predicates can also elide as a result of low VP ellipsis that strands a *v* head. The stranded *v* head in this type of ellipsis surfaces with an overt verbal element in it, *u* 'do'. This verb cannot exhibit object agreement (see (60b)):

- (60) a. Cecil-ga (nee) h̥i-hoj̥i anąga Hunter-ga šge (nee) *(h̥i)-hoj̥i.
 Cecil-PROP me 1OBJ-hit and Hunter-PROP also me 1OBJ-hit
 'Cecil hit me and Hunter hit me, too.'
 b. Cecil-ga (nee) h̥i-hoj̥i anąga Hunter-ga šge (nee) u/*h̥i-'u.
 Cecil-PROP me 1OBJ-hit and Hunter-PROP also me do/1OBJ-do
 'Cecil hit me and Hunter did, too.'

According to Johnson (2015b), this state of affairs is compatible with a derivational view of ellipsis, if one assumes that VP-ellipsis in Hocąk is licensed by *v*, and this head enters into an Agree relation with the ellipsis triggering [E]-feature before it enters into Agree with the object.

Clearly, languages (and constructions) differ with respect to the bleeding effect of ellipsis on agreement. To stay with object agreement for a moment, this kind of agreement is not bled in Hungarian, for example. Object agreement in Hungarian is agreement in definiteness, reflected in the so-called objective paradigm on the verb (glossed below as OBJ), as opposed to the subjective paradigm (glossed as SUBJ), which refers to lack of agreement or agreement with an indefinite object. Hungarian also has auxiliary-stranding VP-ellipsis (see Bartos 2001,

²⁰ Note that some works tie the presence of agreement in these configurations not to licensing but to something else: Alexiadou and Gengel (2012) interpret the presence of agreement as the realization of a classifier phrase; Saab and Lipták (2014) and Murphy (2018) argue that overt inflection is due to the resolution of the stranded affix filter violation that emerges when the NP is elided, as was mentioned in Section 2.3.4.

Lipták 2018), a VP can be elided after auxiliaries like the future auxiliary *fog* (see Kenesei 2001 for a definition of auxiliaries in Hungarian). This verb, being a transitive verb, obligatorily shows object agreement with the object of its infinitival complement, and this kind of (long distance) agreement is obligatorily retained under VP ellipsis as well, see the well-formedness of B1 in (61) and the ill-formedness of B2, which shows that *fog* must agree with *Petit*, the definite object of the infinitive.²¹

- (61) A: Felhívod akkor Petit?
 PV.call.2SG.OBJ then Peti.ACC
 ‘Will you call Peti then?’
 B1: Fel fogom hívni—Petit.
 PV FUT.1SG.OBJ call.INF Peti.ACC
 B2: *Fel fogok hívni—Petit.
 PV FUT.1SG.SUBJ call.INF Peti.ACC
 ‘I will.’

Assuming that object agreement is a syntactic operation in both Hocak and Hungarian, the difference between (60) and (61) is difficult to make sense of in non-derivational approaches to ellipsis. If ellipsis is PF deletion and does not interfere with syntactic operations, only (61) is predicted (alongside with (58) and (59)). The derivational ellipsis approach stands a chance to explain the difference, if Hocak and Hungarian can be shown to differ when it comes to the structural timing of the ellipsis operation and object agreement. One should be able to find evidence that ellipsis is triggered earlier than the Agree operation in Hocak, but not in Hungarian.²² To our knowledge, there have been no attempts to reconcile the different patterns of agreement this way, a topic that will no doubt attract attention in the coming years.

3.2.4 Cliticization

Cliticization shows cross-linguistically distinct patterns across ellipsis domains: in some languages ellipsis feeds cliticization and in others it bleeds cliticization. Bleeding effects have been identified in various TP-ellipsis configurations, see Merchant (2001) and van Craenenbroeck (2010b) on the absence of subject clitics on *wh*-phrases in sluicing and Saab and Zdrojewski (2012) on the absence of clitic doubling with contrastive fragments.

Confining our attention to VP ellipsis and to second position cliticization in Slavic languages only, the bleeding effect of ellipsis can be illustrated by Serbo-Croatian VP ellipsis. Under VP ellipsis, pronominal clitics in this language do not escape a VP ellipsis site, but auxiliary clitics do. This is illustrated in (62) from Bošković (2001:82) (but see Stjepanović 1998 for conflicting views).

- (62) a. Marija *ga* nije poljubila, a Ana *ga* jeste poljubila.
 Marija him.ACC is.NEG kissed and Ana him.ACC is kissed

²¹ (61B) also features preverb-climbing, an ellipsis-independent process by which the preverb (glossed as PV) of the infinitive VP appears left-adjacent to the finite auxiliary that selects the infinitive.

²² Alternatively, it can be the case that differences stem from the different timing of agreement. According to some scholars, certain types of agreement phenomena should not be treated as purely syntactic operations, but rather be decomposed into suboperations, spread across the syntactic and postsyntactic domains (Arregi and Nevins 2012, Bhatt and Walkow 2013, Kalin 2020b). If a suboperation of object agreement can be shown to be a late PF-operation in Hocak (but not in Hungarian), the bleeding effect of ellipsis in this language will follow under any view of PF deletion. Last but not least, language-particular differences of the above sort can also stem from the fact that some agreement markers are actually clitics in some languages but not others (see Section 3.2.4 on cliticization).

- b. Marija *ga* nije poljubila, a Ana jeste ~~poljubila~~ *ga*.
 Marija him.ACC is.NEG kissed and Ana is kissed him.ACC
 ‘Marija didn’t kiss him, but Ana did.’

Bošković (2001) argues that clitics move in syntax, and the second position requirement is phonological in its nature. Under his account, the boldfaced clitic *ga* in (62) does not violate the second position requirement, because it is deleted at PF. A different explanation for the bleeding effect of VP ellipsis on cliticization has been put forward by Ionova (2018, 2020). Ionova argues that pronouns originate inside the VP (while auxiliary clitics are generated outside the VP) and they only acquire their clitic/non-clitic status postsyntactically upon vocabulary insertion. In Ionova’s view, ellipsis blocks vocabulary insertion, consequently pronouns inside the ellipsis site are never marked as clitics and do not have to move to the second position, which explains why they never show up in second position in elliptical clauses in the first place.

The opposite effect—ellipsis feeding cliticization—has been observed in Slovenian. In this language, in opposition to Serbo-Croatian, pronominal clitics can be stranded when the verb phrase is elided, as shown in (62), from Priestly (1993: 429). Note that *ga* is not the full form of the pronoun; the full form is *njega*.

- (63) Si že končal delo? Predvčerajšnjim še ne,
 AUX.2SG already finished work day-before-yesterday still NOT
 včeraj pa sem *ga*.
 yesterday but AUX.1SG him.ACC
 ‘Have you finished the work? The day before yesterday I didn’t, but yesterday I did.’

In addition, cliticization also proceeds unhampered in larger ellipses in Slovenian. As Dvořák (2007) shows, clitics are allowed as the sole stranded item in elliptical answers to polarity questions (as in (64B1)) and are functionally equivalent to verbal echoes like (64B2).

- (64) A: Ali *ga* poznaš?
 Q him.ACC know.2SG
 ‘Do you know him?’
 B1: *Ga*. B2: Poznam.
 him.ACC know.1SG
 ‘I do.’

In Ionova’s (2020) approach to these data, the feeding effect of ellipsis on cliticization in Slovenian is argued to follow from the fact that clitics undergo syntactic movement to the second position and thus escape from ellipsis, which is defined as vocabulary non-insertion. In addition to the above, the ways clitics can be prosodically realized arguably also contributes to the prosodic well-formedness of (63) and (64B1). Franks (2016) considers Slovenian clitics prosodically deficient elements that do not project prosodic feet and that lack lexical stress. Despite this deficiency, they can occur under ellipsis, as there is a last resort PF-rule in the language that imposes a default stress on the final element whenever an intonational phrase contains no footed syllable. When this last resort PF-rules apply, clitics can acquire word-level prosody.

As the above facts and observations illustrate, the interaction of ellipsis and clitic placement is influenced not only by syntactic factors, such as the timing of ellipsis and the timing of cliticization, but is also heavily dependent on prosodic factors, such as stress placement on the

remnants of ellipsis. The same conclusion is reached by Bennet et al. (2019) concerning the interaction between ellipsis and subject pronoun placement in Irish.²³

3.3 Summary of this section

As this section has shown, while arguments on the feeding and bleeding effects of ellipsis are very informative, they are only robust if there is solid evidence about the exact time of operations that ellipsis interacts with in this way, evidence that is available independently of ellipsis. It is fair to say that our understanding of the effects ellipsis exerts on other phenomena is far from solid and that the nature of evidence in some domains is conflicting or leads to conflicting views on ellipsis. While interactions with movement are reasonably well-researched, interactions with agreement and cliticization have been explored in less detail. The same can be said about the constituency of the elided material: while some types of ellipsis, such as left edge ellipsis and canonical non-coordinative ellipsis exhibit a profile of prosodic or syntactic constituent deletion respectively, in the case of many other types of ellipsis the picture is less clear.

The lack of clarity in some domains is in part due to construction-specific and language-specific variation among the many existing elliptical constructions. It is known that different types of elliptical constructions can have different syntactic, prosodic, and discursal properties, properties that are hard to unify and which, when one attempts to explain them in a uniform way, lead to contradictory results. For this reason, some scholars have argued that theorizing should not be guided by the conviction that a unified theory should be feasible (see Ginzburg and Miller 2018 and Kehler 2018 explicitly on this point). We concur with these scholars. Even though we would like to view ellipsis as a singular operation that applies in many contexts and in many languages in the same way—a view that should be a priori preferred to any other possibility—there is a chance that we should rather entertain the possibility that ellipsis is not a uniform operation after all, and that ellipsis can apply at multiple points in a derivation, in other words, that ellipsis is distributed from syntax to PF. This could entail that in addition to early ellipsis (operating on syntactic representation) there also exists a postsyntactic type of ellipsis, or perhaps more than one postsyntactic type: an early type (applying before or at linearization) and a late type (operating on prosodic representations). If correct, this view of ellipsis may be able to explain some of the variation we have seen on the

²³ Bennett et al. (2019) is devoted to the interaction of subject pronoun incorporation and ellipsis in Irish. Simple subject pronouns in non-elliptical clauses incorporate into the inflected verb via head movement, which is triggered by a property of the subject pronoun. When the TP containing the original position of the subject is elided, subject pronoun incorporation is normally bled. It is not bled, however, if the overtness of the subject pronoun is required for prosodic reasons, namely when the subject pronoun needs to carry focal accent. In this case, subject pronoun incorporation proceeds and the subject pronoun shows up outside the ellipsis site; consider (ic) for illustration.

- (i) a: Cén aois anois tú, a Shéamais? *Irish*, Bennet et al. (2019: 91)
 what age now you VOC Séamas
 ‘How old are you now, Séamas?’
 b: Tá mé ag tarraingt ar na trí scór, a Rónáin.
 be.PRS I PROG draw on the three score VOC Rónán
 ‘I’m almost sixty, Rónán.’
 c: Níl tú.
 neg.FIN.be.PRS you
 ‘You are not!’

Since the pronoun is never focus-marked itself (it is given), its presence in sentences like (ic) has to do with the realization of verum focus. As Bennett et al. show, this pattern of subject pronoun realization can be accounted for in the Y-model of grammar, if the postsyntactic derivation is allowed to contain parallel and simultaneous optimization of operations.

previous pages, while at the same time bringing up many questions on its own, such as the question of what determines which type applies in any given grammatical context.

4. This volume's content

The six novel contributions in this volume all attempt to determine when ellipsis applies in the derivation. With the exception of Saab's programmatic contribution (Chapter 5), all present case studies of certain elliptical phenomena in specific languages and provide a set of arguments for a particular derivational timing, also providing important novel insights about the licensing of ellipsis, the identity relation between ellipsis and its antecedent, and the structural representation of elliptical clauses across the modules of grammar.

The contribution by David Erschler (Chapter 2) discusses a hitherto undescribed case of ellipsis in a handful of head-final languages, namely Turkish and the understudied Iron and Digor Ossetic (Iranian, Indo-European) and Eastern Armenian (Armenian, Indo-European). This novel type of ellipsis, which the author dubs *slending* (after *slightly extended noun deletion*) occurs in structural and pragmatic environments that resemble well-known cases of gapping and include two contrastive remnants in the gapped clause. Slending differs from gapping in that in addition to eliding the verb in the gapped clause, this process also elides something "extra" in the noun phrase adjacent to the gapped verb. Characteristically, slending elides the noun and material that normally follows the noun, such as a case marker or an adposition, and strands a nominal modifier, such as an adjective. In cases of noun phrases with a possessor, it can eliminate both the possessor and the possessum, suitably case-marked and adjacent to each other, leaving behind nothing but a modifier of the possessor. In both cases, the material missing in these noun phrases can be shown not to be the result of applying ordinary noun or N' ellipsis in these languages.

A large proportion of the paper is dedicated to careful argumentation to the effect that slending cannot be derived in a series of constituent deletions. As the second remnant is shown not to be able to undergo movement either outside or inside the noun phrase, deletion of the noun and material to its right cannot be derived via ellipsis of a constituent that has been vacated by the remnant. Neither can dependent ellipsis and in-situ ellipsis derive the facts. Instead, the author presents arguments for the claim that the material undergoing ellipsis in slending does not form a syntactic constituent, but rather corresponds to a string of words that are necessarily contiguous. From the observation that it is not syntactic constituency but rather linear contiguity that defines the missing material, the conclusion arises that the crucial step of extra deletion does not take place in the narrow syntax, but is a late instance of deletion in the PF component. It follows linearization and vocabulary insertion, and its late timing explains why it strictly only operates on contiguous strings, disregarding syntactic constituency.

The contribution of Griffiths and den Dikken (Chapter 3) is a case study of the licensing requirements of English VP ellipsis (post-auxiliary and British *do* ellipsis), with the aim of defining the syntactic licenser and licensing condition, also taking into account possible aspects of prosodic licensing. Novel evidence is provided for the proposal that VP ellipsis needs to be licensed by Spec–Head agreement between T and the occupant of TP and that British English *do* ellipsis should not be captured using the derivational ellipsis model, which restricts the possibility of ellipsis to certain derivational times. The core empirical contribution comes from a large number of novel observations about English, all involving clauses with what they call "Unusual Subjects", that is, subjects other than an argumental noun phrase. The authors show that Unusual Subjects that do not exhibit Spec–Head agreement with T cannot be followed by VP ellipsis: locative inversion and double-NP specificational copula clauses whose precopular NP does not agree with the copula are of this type. In contradistinction, *there*-existentials do allow for VP ellipsis because there is agreement between *there* and T in one feature, namely

person. On the basis of these considerations and some others, the authors conclude that the ellipsis licenser of English post-auxiliary VP ellipsis is a featurally complete T head.

Extending their study of the licensing role of Spec–Head agreement to raising configurations with Unusual Subjects, Griffiths and den Dikken find that VP ellipsis in this domain is only possible in the embedded non-finite clause if it is possible in the main clause, and this follows straightforwardly from the feature-sharing mechanism they use to model agreement relationships in their paper, namely Pesetsky and Torrego (2004). The core insight of this proposal is that matrix T and embedded T are part of the same Agree-chain, and thus the ellipsis licensing capacity of matrix T is transferred to the embedded T.

In the final part of their paper, Griffiths and Den Dikken argue against derivational ellipsis approaches to British *do* ellipsis (Aelbrecht 2010, Baltin 2012), observing that among other things, the pattern of ellipsis licensing reflected by the behaviour of Unusual Subjects is identical in *do* ellipsis and post-auxiliary VP ellipsis. They put this down to the fact that *do* ellipsis is indirectly licensed by a featurally complete T as well, which transfers its licensing capacity to *v*, an element that is involved in the same Agree chain with it. The authors advance a non-derivational account of these facts, because they observe that derivational proposals make incorrect predictions about extraction possibilities, resonating the findings of Thoms and Sailor (2018): not only are some types of A-bar extraction possible out of the lexical VP, extraction from Sp,*v*P is also degraded, unlike previously reported.

In Chapter 4, Murphy and Müller argue that the derivational view of ellipsis can offer an account of the phenomenon of *vehicle change*, which refers to the stipulated equivalence between an R-expression and a pronoun in an ellipsis site, in configurations where the R-expression would normally cause a Principle C violation (Fiengo and May 1994).

(65) Mary loves John_i, and he_i thinks that Sally does <love him_i / *John_i >, too,

Taking a derivational approach for binding, and specifically, Principle C configurations, based on Agree, the paper proposes that vehicle change is due to the derivational nature of ellipsis. The R-expression is generated inside the ellipsis site, but at the point when the potential binder outside the ellipsis site is merged into the syntactic structure, the R-expression is no longer accessible for syntactic computation: ellipsis, an instance of null spell-out, makes the R-expression inaccessible for the further operations. This makes R-expressions inside an ellipsis site invisible for a potential higher binder. The authors show that their account have a better empirical coverage than the “replace-with-a-pronoun” account of Fiengo and May (1994), and they comment on the repercussions the derivational ellipsis view has for phenomena such as agreement, quantifier raising, and movement out of ellipsis sites.

The paper also develops the proposal that ellipsis can be what they call “successive cyclic”, meaning that ellipsis of a larger constituent takes place in smaller chunks, namely the smaller phases making up the larger constituent. They offer a technical implementation in terms of a spell-out feature on each phase head that can be either positively specified (for overt spell-out) or negatively specified (for null spell-out) and valued under Agree with the next phase head down, in specific interaction with the head bearing the [E] feature that in effect blocks percolation of the negative specification of this feature. This mechanism is capable of answering the first challenge for phase-based accounts to ellipsis that we mentioned in Section 2.4.

While the authors take ellipsis to be triggered by a licensing head and to be a case of null spell-out, they also note that ellipsis differs from standard spell-out in that the latter does not make R-expressions inside a spell-out domain invisible, an observation that they suggest could be due to ellipsis involving Structure Removal, following ideas of Müller (2017, 2018).

Saab’s contribution to this volume in Chapter 5 specifies the programmatic outlines of a theory of ellipsis that finds its core in the author’s (2008) dissertation but is now modified in

important respects. The author differentiates between ellipsis of phrases and ellipsis of heads. The former takes place in the syntax, the latter in the PF component. Ellipsis as a process is considered as non-distinct from copy deletion and as such is argued to show particular interactions with copy deletion. The null realization of ellipsis is taken to be the result of vocabulary non-insertion in PF, in the Distributed Morphology framework. Using Embick's (2015) replacive view of vocabulary insertion, according to which abstract morphemes have a placeholder variable Q normally to be replaced with phonological content, the author argues that ellipsis deletes the Q element and thus blocks phonological realization. The condition for Q-deletion is c-command by a chain link or by an [E]-feature bearing head in the case of phrasal ellipsis. In case of head ellipsis, the necessary conditions are immediate locality or adjacency.

Head ellipsis, in contradistinction to phrasal ellipsis, is a morphological operation and takes place under immediate locality or under adjacency. Phrasal and head ellipsis are therefore timed differently. In addition, phrasal ellipsis also has a distinct timing with respect to phrasal copy deletion: Q-deletion in phrasal ellipsis applies after Q-deletion in copy deletion has taken place. This explains why phrases extracted out of ellipsis sites need not be identical to a particular correlate in the antecedent clause. The paper also argues that head movement out of ellipsis sites is constrained by identity in well-defined cases, given that the structural configuration that results in head-to-head adjunction (taken to be a syntactic process) crucially lacks c-command between the moving item and its copy.

Concerning the nature of the identity condition that licenses this type of ellipsis, the paper subscribes to the view that identity for phrasal ellipsis is mainly syntactic and concerns only information contained in List 1—more specifically, labels of syntactic categories, containing category features and LF interpretable features.

Sailor's paper (Chapter 6) makes a clear distinction between ellipsis licensing, which he assumes to take place in syntax proper, and the "silencing" effect of ellipsis, which he claims to take place at a much later stage in derivation. Sailor's chapter is centred around the non-trivial questions: "how does elided material interact with surrounding overt material with respect to phonological (and morphological) operations, and what can this tell us about when the silence of ellipsis arises in the derivation?" Adopting the articulated view of PF from Distributed Morphology (DM), Sailor examines two novel sets of data in order to investigate whether there is morphophonological interaction between material that falls inside vs outside the ellipsis domain. Discussing Italo-Romance *raddoppiamento* sandhi (both phonological and syntactic types) and tone sandhi in Taiwanese, Sailor illustrates how ellipsis-external material does not "see" ellipsis-internal material with respect to such morphophonological phenomena. Given our present understanding about the timing of these operations, he uses the lack of communication due to ellipsis as a diagnostic to estimate the timing of silencing.

Sailor shows that in the case of Taiwanese tone sandhi, which he claims to involve allomorphy, the allomorph selection for the ellipsis-adjacent material is affected by the silence. If Vocabulary Insertion (VI), in terms of DM, is the time in which allomorphy is set, then Taiwanese tone sandhi indicates that the silence of ellipsis must arise at (or earlier than) VI.

Concerning the Italo-Romance *raddoppiamento* sandhi, an external sandhi phenomenon that results in word-initial fortition, Sailor tests its interaction with ellipsis both in cases in which the trigger for sandhi is elided and in cases in which the (would-be) target of sandhi is elided. The data show that this sandhi phenomenon operates on the output of the ellipsis operation. Based on this, Sailor concludes that the silencing of ellipsis applies earlier than the point where *raddoppiamento* sandhi is assessed. This is particularly informative in Italo-Romance varieties where this phenomenon seems to be sensitive to syntactic structure, since standard DM assumptions hold that such information is erased by the time VI has applied. Given this interaction of ellipsis with *raddoppiamento* sandhi, Sailor concludes once again that the silence of ellipsis arises no later than at VI, a conclusion that converges with the Taiwanese facts.

Therefore, ellipsis cannot be conceived as phonological deletion, as is widely assumed. The facts discussed in this chapter instead support a vocabulary-non-insertion view of silencing, instead.

In the second half of the chapter, Sailor argues that these facts could also be taken to satisfy a previously unexplored prediction arising Aelbrecht’s (2010) theory of ellipsis licensing. According to this idea, immediately after an ellipsis domain is licensed in syntax, it is sent to the interfaces. Sailor calls this approach “Segregated Transfer”, in which the elided material is segregated from the rest of the syntactic derivation as soon as it is licensed. He argues that, since this view does not allow simultaneous reference to ellipsis-internal and external material after licensing has occurred, it naturally accounts for the Taiwanese and Italo-Romance data. In the rest of the chapter, Sailor further illustrates how Segregated Transfer can predict ellipsis facts involving other types of syntactic interactions, such as the interaction of ellipsis with head movement, phrasal movement, and agreement.

Weir (Chapter 7) focuses on two seemingly unrelated types of ellipsis: left-edge ellipsis cases, as in (67), see Section 2.3.5, and fragment answers which are an instance of clausal ellipsis in (68), and provides an account that successfully derives both types via a single mechanism.

- | | | | |
|------|---------------------------------|-------------------------------|--------------------|
| (66) | Going to the pub tonight. | (= I am going...) | left-edge ellipsis |
| (67) | A: What did John eat? B: Chips. | (= John ate chips) | clausal ellipsis |

While left edge ellipsis is usually assumed to be prosodically governed, clausal ellipsis has been previously argued to be syntactically licensed under the silent structure to ellipsis approach (Merchant 2004). Weir argues that this is not true.

The unifying account suggested in Weir’s chapter claims that both types of ellipsis involve the deletion of recoverable material, which takes place in order to achieve well-formed structures at the syntactic and prosodic levels. Adopting an optimality theoretic approach of the syntax–prosody interface, Weir claims that left-edge ellipsis is the result of the deletion of the recoverable material on the left edge of the prosodic domains in order to satisfy a prosodic well-formedness constraint that is active in English prosodic grammar. This constraint is called STRONGSTART. This constraint punishes those prosodic constructions in which the left-most item in a prosodic domain is of a weaker prosodic category type than the type of its sister prosodic constituent. In order to satisfy this constraint, the weaker prosodic constituent (and in the case of left-edge ellipsis this is unaccented and recoverable material) on the left is deleted. As for fragment answers, in which the remnant is always a focused item, Weir claims that covert focus-related movement takes place in English. Following the copy theory of movement, Weir suggests that English penalizes those constructions in which the lowest copy is not pronounced in cases of focus-related movement (which excludes some other types of movement such as wh-movement). He implements this restriction via a constraint called “pronounce the lowest copy – PRNLWSTCOPY”. Additionally, adapting Richards’ (2010) proposal on wh-C contiguity at the prosodic level, Weir also claims that focused items must be prosodically aligned roughly at the left edge of a constituent. He derives this requirement via a focus alignment constraint: ALIGN-[FOC]. In his account, ALIGN-[FOC] and PRNLWSTCOPY crucially interact in fragment answer cases, which yields the pronunciation of the lowest (and often sentence non-initial) copy of the focused item, with the cost of deleting any other material that is otherwise on the way between the focused item and the related functional head on the left-periphery. Later in the chapter, Weir also discusses previously unnoticed data and illustrates how focus alignment (coupled with copy deletion) interacts with STRONGSTART, and another floating constraint that punishes deletion (called MAX) in predicting such data as well as in predicting the optionality of ellipsis in both types.

Based on the observation that left-edge ellipsis does not seem to be syntactically licensed, and his claim that fragment answers and left-edge ellipsis are derived via the same mechanism, Weir concludes that there is no *sui generis* syntactic licensing of (fragment) ellipsis. In terms of the timing of ellipsis (at least left-edge and clausal ellipsis), Weir's chapter concludes that the operation takes place rather late, at the interfaces.

5. Summary

All in all, this volume presents a comprehensive and up-to-date discussion of the derivational timing of ellipsis in PF-deletion theories to elliptical constructions. The contributions make clear to the reader that ellipsis is an interface phenomenon, exerting an influence on all kinds of linguistic representations. As Bennet et al. (2019: 29) concludes, "ellipsis is a very complex phenomenon whose effects are distributed over all aspects of linguistic representation (pragmatics, semantics, syntax, morphology, phonology, the lexicon)". As a result, ellipsis clearly interacts not only with structure formation and syntactic dependencies, but also with morphological and phonological well-formedness requirements. These aspects of ellipsis combined with the fact that the derivation of sentences proceeds via intricately timed steps that theorists do not always have full consensus on, make it quite difficult to successfully pinpoint at what point ellipsis applies. While PF-theories came a long way, many issues still remain, which makes ellipsis an exciting field of research, in need of further exploration for many years to come.

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