Rethinking the Model of Grammar: PF after LF

Jan-Wouter Zwart
University of Groningen
https://orcid.org/0000-0002-2331-5481
c.j.w.zwart@rug.nl

Abstract

The interface levels PF and LF of the Government and Binding theory (GB) have been redefined in Minimalism as a 'sensory-motor' component (for PF) and a 'conceptual-intentional' component (for LF). The main point of this article is that this redefinition of the interface levels should lead to an adjustment of the model of grammar, such that Narrow Syntax feeds LF, and LF feeds PF. We propose that LF is the component of the model of grammar in which conceptualizations and intentions of the speaker become relevant and that Narrow Syntax (Merge) should be blind to these speaker-sensitive aspects. The argument is based, among others, on case/agreement phenomena that cannot be analyzed as a function of Merge, but are semantically motivated, i.e. refer to conceptualizations and intentions of the speaker. Since these conceptualizations and intentions of the speaker are introduced at LF, and inflectional morphology is realized at PF, LF must feed PF.

Abstract in Catalan

Els nivells d'interfície FF i FL de la teoria de la Recció i el Lligam (RL) s'han redefinit en el minimisme com un component "sensor-motor" (en el cas de la FF) i un component "conceptual-intencional" (en el cas de la FL). La contribució principal d'aquest article és que aquesta redefinició dels nivells d'interfície hauria de conduir a un replantejament del model de la gramàtica, de manera que la sintaxi estreta alimenti la FL i la FL alimenti la FF. Proposem que la FL és el component del model de la gramàtica en què les conceptualitzacions i les intencions del parlant esdevenen rellevants i que la sintaxi estreta (l'operació Ajunteu) hauria de ser cega a aquests aspectes que són dependents del parlant. L'argument es basa, per exemple, en fenòmens de cas/concordança que no es poden analitzar com a funció de l'operació Ajunteu, sinó que estan motivats semànticament, és a dir, es refereixen a conceptualitzacions i intencions del parlant. Com que aquestes conceptualitzacions i intencions del parlant s'introdueixen a la FL i la morfologia flexiva es realitza a la FF, la FL ha d'alimentar la FF.

Keywords
minimalism, model of grammar, PF, LF, speaker/hearer phenomena, case, agreement, ellipsis, binding, scope, wh-movement

1. Introduction*

The model of grammar assumed in theoretical syntax today typically involves three components (e.g. Chomsky 1995:228): a set of elements to work with (Numeration), a structure-building operation (Narrow Syntax), and a set of externalization components linking the structure to other components of the mind/brain. The externalization components are traditionally called LF (for semantics) and PF (for morphology/phonology), and we will stick to the traditional designations (rather than use C/I for 'conceptual/intentional' and S/M for 'sensory/motor').

This model takes the syntactic component (Narrow Syntax) to feed into both LF and PF directly, predicting no direct interaction between the components dealing with sound and meaning. Any sound-meaning interaction observed should be considered to be indirect, mediated by Narrow Syntax.

The question I want to raise in this article is whether that traditional separation of PF and LF should be maintained. I will argue that there is reason to reconceptualize the model in such a way that PF is ordered after LF, and that in fact the syntax-PF interaction is indirect, and mediated by LF.

2. Definitions

In line with current thinking in theoretical syntax (e.g. Chomsky et al 2023), I take *Narrow Syntax* to be defined by the operation Merge, combining two elements from the Numeration into a set. (In fact, it is better to think of the output of Merge as an ordered pair, but I will ignore such

* This article finds its origin in discussions with the late Sam Epstein, who insisted that the will of the speaker plays no role in Narrow Syntax. This work was presented at the 34th Coloquio de Gramática Generativa in Madrid, on May 7, 2025, and was discussed prior to that at a workshop in honor of Ellisabeth Kerr and Zhen Li, at Leiden University, September 4, 2024, at the DGfS Summer School 'Form-Meaning mismatches in spoken and visual communication' held at the University of Göttingen in August 2024, and at the CLCG Syntax Seminar at the University of Groningen in the Fall of 2024. Many thanks to the audiences at these occasions, in particular to Klaus Abels. Also many thanks to Marjolein Wietske Talsma, who raised several issues the resolution of which led to the current proposal.

issues here.) Merge is a recursive operation, meaning that the output of any operation Merge can be the input for another such operation. This is the basic generative system of the model of grammar.

Other operations of Narrow Syntax, should they exist, must be a function of Merge. Chomsky et al (2023) discuss two additional operations, Agree and Form Copy, but these will play no role in the discussion here, as I consider them redundant. Movement is taken to be just another instance of Merge ('Internal Merge'), joining an element with one of its terms. Importantly, not all reorderings that can be observed are taken to be part of Narrow Syntax. Head movement, right dislocation, cliticization, scrambling (however defined) and other effects of linear order may be argued to take place at PF. Likewise, questions of linear order play no role in Narrow Syntax, which is merely concerned with hierarchical order, and come to the fore only at PF.

The position of covert movement, which used to define LF (e.g. May 1985), in the current model of grammar is questionable (cf. Chomsky 1995: 377). It is not clear that Merge, which defines Narrow Syntax, should be taken to exist covertly as well. In earlier versions of the theory, most notably Government and Binding theory, syntax was taken to involve an overt and a covert part, the latter having no effect on PF (observable linear order). This was employed in the analysis of languages lacking overt wh-movement and in the derivation of (inverse) quantifier scope. On this conceptualization, syntax/LF is just a single component with a randomly placed spell-out point feeding PF. The currently assumed separation of PF and LF is a remnant of this conceptualization of syntax as having an overt and a covert part.

To our knowledge, very little work has been done on defining LF if covert movement is taken not to be part of it. I will make some tentative proposals below. At the very least, it would seem appropriate to regulate semantic dependencies (i.e. quantification, scope) at LF, and to in some way mark scope relations that appear to not be a direct function of Merge (i.e. inverse scope). But as I will argue below, several aspects of interpretation, having to do with discourse and information structure, but also categorization (including reanalysis), idiomatic interpretation, and *ad sensum* effects (semantics overriding syntactic features) should arguably be situated here. The same might be said for binding and reference, and for the factors involved in various types of ellipsis and coordination more generally. It will be seen that many of the aspects listed here are currently taken to be part of Narrow Syntax, and we will be concerned with the question to what extent this is felicitous.

PF is defined by whatever is required to generate an observable output. Minimally this

involves phonology, but crucially morphology is also taken to be part of PF ('morphology after syntax') in the sense that the choice of the optimal form for spelling out syntactic features (such as agreement, tense, etc.) is done postsyntactically. That is, there is a point where terminals generated by Narrow Syntax are substituted for forms from a language specific lexicon, essentially a collection of ordered paradigms (e.g. Halle and Marantz 1993: 121-122). Likewise, linearization, yielding head-initial and head-final orders, as well as certain shifts involved with heavy or light categories, is taken to be a postsyntactic operation located at PF (Chomsky 1995: 334). This includes ellipsis, which is taken to be just failure to spell-out (Merchant 2001). Finally, and importantly for our discussion, head movement, including 'second position phenomena', is also considered to be such a linearization effect, located at PF, rather than a syntactic movement of Narrow Syntax (Chomsky 2001, Zwart 2017).

These definitions are important for the evaluation of previous claims on the relation between the syntactic, semantic and phonological components of the grammar (e.g. the contributions in Inkelas and Zec, eds. 1990, and for instance Culicover and Jackendoff 2005:18). For example, the observation that the construction of Intonational Phrases (a PF-defined prosodic category) is relevant to the phenomenon of Heavy NP Shift (Zec and Inkelas 1990:377) does not lead to the conclusion that phonology feeds syntax, if Heavy NP Shift is no longer considered to be a rule of syntax.

It seems that much of the evidence adduced in previous work targets phenomena that are currently not taken to be part of Narrow Syntax, such as cliticization, deletion, and head movement. So this article is first and foremost an investigation of the consequences of the current definition of the syntactic, semantic, and phonological components for the way the model of grammar is organized.

3. Semantically motivated agreement morphology

It has long been observed that agreement morphology can be sensitive to features that seem to reference aspects of the semantics or the discourse (e.g. Barlow 1999). This overrules the expected morphology motivated by syntactic dependency (e.g. subject-verb agreement). Examples are given in (1)-(3).

(1) *British English*

The police **have** made some investigations

(2) *Swahili* (Bokamba 1980:12)

ki-jana **a**-me-anguka

7-youth SU:1-PERF-fall

'The lad fell.'

(3) *Inari Sami* (Corbett 2006:146)

alma-h kuá'láást-**ava**/eh onne

man-NOM.PL fish-3DU/3PL today

'The (two) men are fishing today.'

In (1), the subject *the police* is morphologically singular; the plural agreement on the auxiliary *have* is motivated by the circumstance that *the police* is interpreted as a plurality. In (2), the subject *kijana* is marked by its prefix as being from the 7/8 gender class (for inanimate or inferior entities), yet the subject agreement *a-* is taken from the 1/2 gender class (for human beings), apparently for semantic reasons (a lad being human). In (3), the subject *almah* does not betray the cardinality of the men, but the agreement, which is optionally dual or plural, appears sensitive to this semantic aspect of the subject.

In the current model of grammar, it is natural to suppose that the semantic information overruling a syntactically motivated feature specification becomes available at LF. If so, and if inflectional morphology is generated at PF, LF must feed PF.

We may repeat this observation with agreement determined by aspects of the speech situation. This includes honorifics, the features of speech act participants, and discourse status.

Honorific agreement, referencing a level of respect in which a referent of the clause is held, is quite common in the languages of the world. Below is an example:

(4) *Muna* (Van den Berg 1989:51)

do/to/o-mai-ghoo ne hamai

2SG.REALIS.UNFAM/HONOR/NEUTR-come-IO LOC where

'Where do you come from?'

(unfam = unfamiliar, honor = respected, neutr = unmarked)

Here the second person addressee may trigger agreement on the verb betraying the respect in which the addressee is held by the speaker. The second person subject, being unexpressed, does not itself display these features, so that the honorific aspect appears to be semantic rather than syntactic. (Muna does have sets of polite and neutral second person pronouns.)

In other cases, it is clear that the honorific agreement is not syntactically triggered. For example, in Maithili the honorific agreement shows up in the object agreement slot, and references the respect in which the possessor of the subject is held:

(5) *Maithili* (Yadav 1997:181)

a. tõ ok-ra beta-ke dekh-l-əhik
2:NHON 3:NHON-GEN son-OBJ see-PAST-2NHON>3NHON
'You saw his son.'

b. toh-ər beta ok-ra dekh-l-kəuk
2:NHON-GEN son 3:NHON-OBJ see-PAST-3NHON>2NHON
'Your son saw him.'

The agreement ending is fused, indicating subject and object in that order. In (5b), the subject is the 3sg *tohər beta* 'your son', but the object slot references the 2sg possessor of the subject (*tohər* 'your') rather than the object *okra* 'him'. As there is no evidence that the construction involves possessor raising (Stump and Yadav 1988), the honorific agreement again seems to be semantically rather than syntactically motivated.

The same object agreement slot can be used for honorific agreement with the adressee in the related language Angika:

(6) *Angika* (Bhattacharya 2011:11)

a. huni ok-raa dekh-al-ak-**hin**
3:HON he-OBJ see-PAST-3SU-3OB
'He saw him.'

b. huni ok-raa dekh-al-ak-**hõ**
3:HON he-OBJ see-PAST-3SU-**2:HON**
'He saw him.' (said to a respected person)

Since the addressee is not syntactically represented, the agreement must be semantically motivated. A common solution is to postulate a speech participant projection high in the syntactic tree structure, so that the agreement could be a function of syntactic structure (e.g. Miyagawa 2012 for Basque; see also Wiltschko 2021). But this is unnecessary if PF can be fed by LF.

Related to this is the observation that in Dargi, both subjects and objects may trigger agreement on the verb, the choice being determined by the position of the subject and object on the person hierarchy (Van den Berg 1999: 158). A similar sensitivity to the person hierarchy is observed in languages like Basque and Georgian, where the person hierarchy determines what kind of agreement shows up in which agreement slot (Béjar and Rezac 2009). Thus, in Basque, the verb initial *object* agreement slot (*n-* in (7a)) is exceptionally filled by a marker referencing the first person *subject*, in cases where a first person subject is combined with a third person object:

(7) *Basque* (Béjar and Rezac 2009:37)

a. ikus-i **n**-ind-u-∅-en
see-PERF 1SG-NPRS-have-3-PAST
'He saw me.'

b. ikus-i **n**-∅-u-∅-en
see-PERF 1SG-NPRS-have-3-PAST
'I saw it.'

These observations raise the question where in the model of grammar the position of a noun phrase on the person hierarchy is evaluated. In the absence of compelling evidence to the contrary, I would like to maintain that this evaluation belongs in the conceptual/intentional component, LF, which should therefore be taken to feed PF, where the morphology is realized.

Relevance of the speech situation for inflectional morphology is also found in the rare phenomenon of speaker agreement:

(8) *Ignaciano* (Ott and Burke de Ott 1983:36)

a. ma-yana
3SG.MASC-go
'he must go' (spoken by a male)

b. ñí-yana
3SG.MASC-go
'he must go' (spoken by a female)

If information about the speech situation is not part of Narrow Syntax, but becomes available at LF, these facts again suggest that PF is ordered after LF.

Agreement may also be a function of information structure status of the referents of argument noun phrases (see Corbett 2006:197f). For instance in Khanty objects trigger agreement only if they are 'secondary topics' (Nikolaeva 2001). Or a focused subject triggers special, reduced agreement in Somali (Saeed 1993 in Corbett 2006:203). Here the arguments carrying these particular information structure roles are present in the syntax and the agreement appears to be a function of syntactic organization as well as discourse status. But there are cases where information structure based agreement cannot be explained in syntactic terms, barring complications of the analysis. This applies to the well-known long distance agreement cases in Tsez (Polinsky and Potsdam 2001) and Innu-aimûn (Branigan and MacKenzie 2002), where the agreement trigger is a topic that does not c-command the verb on which the agreement is expressed (cf. Corbett 2006:198). To illustrate:

(9) *Tsez* (Polinsky and Comrie 1999:116-117)

a.	eni-r	[	už-ā	magalu	b-āc'-ru-λi	]	r-iy-xo
	$mother_{II}$-DAT		boy_{I}-ERG	$bread_{III}$:ABS	III-eat-PART-NMLZ		IV-know-PRES
b.	eni-r	[	už-ā	magalu	b-āc'-ru-λi	]	**b**-iy-xo
	$mother_{II}$-DAT		boy_{I}-ERG	$bread_{III}$:ABS	III-eat-PART-NMLZ		III-know-PRES

(both) 'Mother knows the boy ate the bread.'

In (9a), the matrix verb *riyxo* 'knows' shows default agreement, triggered by the complement clause. But in (9b), the verb is *biyxo*, expressing agreement with the third gender object *magalu* embedded inside the complement clause. This can only take place if said object is the topic. The same condition applies to the similar phenomenon analysed in Innu-aimûn in Branigan and MacKenzie (2002). Here it seems that only the semantic (information structure) information is relevant, not the syntax.

In the analysis of Polinsky and Potsdam (2001), the embedded object is raised at LF to the edge of the embedded clause, bringing it close enough to the matrix verb for the agreement to

be a function of syntactic structure. But this is unnecessary if information structure status becomes available at LF, and LF feeds PF. (Needless to say, any explanation of inflectional morphology via LF-raising also supports the idea that LF feeds PF.)

The observations in this section suggest a generalization, which is:

(10) *Generalization*
Unexpected agreement is semantically motivated.

In (10), 'expected' refers to the standard situation where agreement is a function of Merge (i.e. respects c-command relations), and 'semantics' is intended to also include discourse and information structure. If (10) holds, and if agreement is realized postsyntactically as part of PF, LF must feed PF.

The agreement phenomena discussed here do not fall out naturally from an approach to agreement that involves the Agree ('probe-goal') mechanism of Chomsky (2000) and subsequent work. My assumption throughout this research has been that agreement is a function of Merge, and involves feature sharing between an antecedent and a dependent element (see Zwart 2006a). The phenomena noted here can then be understood as involving a further update of the feature content of the dependent element, informed by the intentions and conceptualizations of the speaker that become relevant at LF.

4. Case

Case in Government and Binding theory ('abstract case') is just the term for grammatical function (subject, object), also known as 'structural case'. For case in this sense, we can assume a direct interaction between Narrow Syntax, where grammatical functions are defined, and PF, where case morphology is realized. However, it has always been clear that not all case-markings are structural in this sense, and that some case-marking is more closely linked to semantics. This so-called 'inherent case' is typically linked to the thematic role of the noun phrase in question (e.g. Chomsky 1981:171).

Thus in Marathi, an experiencer subject is marked with the dative case (subjects are ordinarily in the nominative case, or, in the past, in the ergative case):

(11) *Marathi* (Pandharipande 1997:287)

tyālā	apghātāt	dzakham	dzhālī
3SG:DAT	accident:LOC	injury:3SG.F	happen:PAST:3SG.F

'He suffered an injury in the accident.'

In Icelandic, nonagentive subjects (12b-d) may be realized in a range of cases:

(12) *Icelandic* (Thráinsson 2007:201)

a.

Haraldur	borðaði	fiskinn
Harald:NOM	ate	fish:DEF.ACC

'Harald ate the fish.'

b.

mig	dreymdi	illa
1SG.ACC	dreamt	badly

'I had a bad dream.'

c.

þeim	finnst	Haraldur	skemmtilegur
3PL.DAT	find	Harald:NOM	interesting:NOM

'They find Harald interesting.'

d.

hennar	nýtur	ekki	við	lengur
3SG.F.GEN	enjoys	NEG	with	longer

'She is no longer here (to help).'

Likewise, objects can receive dative or genitive cases instead of the structural accusative case (Thráinsson 2007:208-222). In most instances, these 'inherent' cases can be related to thematic roles. This is supported by the observation that the inherent case of a subject does not revert to accusative in an Exceptional Case-Marking construction, unlike the structural nominative subject case (Thráinsson 2007:164).

What are we to make of this connection between case and thematic roles? In the Government and Binding theory, noun phrases were taken to be assigned a thematic role by the verb, and hence inherent case could be assigned together with that thematic role. In that scenario, inherent case would be a function of the syntactic process of thematic role assignment, and the relation between syntax and PF (where case morphology is realized) could be direct, with no intermediate role for LF.

But the concept of thematic role assignment in syntax has come under intense scrutiny in

Talsma (2025). As Talsma observes, it is very hard to maintain that noun phrases "carry" a thematic role, as thematic roles are not typically morphologically flagged on the noun phrase. Moreover, thematic roles cannot be assigned as a function of Merge (*pace* Collins 2024), requiring in many cases not a head-complement but a specifier-head configuration. Finally, as discussed by Hale and Keyser (1993:96), the little vP of current syntactic theory is more properly to be regarded as a phrasal idiom or a lexical item, suggesting its composition is the domain of a separate, auxiliary derivation in the sense of Zwart (2009). I will refer to a verb/little vP element as a VERB. If the output of such an auxiliary derivation is opaque (as seems natural), noun phrases cannot be generated inside vP, and the mechanism of theta role assignment must be rethought.

Talsma proposes that the subcomponents of (what I call) a VERB (the building blocks of the little vP), such as CAUSE, DO, BECOME, etc., entail certain 'participant requirements' which end up as formal features of the VERB (so-called participant requirement features or PR-features). These PR-features are then valued by the noun phrases that c-command them, in a hierarchically ordered fashion. The interpretive effect of this valuation is that we know which noun phrase (more precisely, which referent) acts as which participant in the event or situation referred to by the VERB. This interpretation clearly is the province of LF.

If this conception of thematic roles is on the right track, the information that certain noun phrases are associated with certain thematic roles does not become available until LF. That means that any thematic role related case realization must be fed by LF, and cannot be the result of a direct interaction between syntax and PF.

More generally, any manifestation of case as related to semantics and/or discourse points to a model of the type contemplated here, where LF feeds PF. This is because Narrow Syntax, i.e. Merge, yields little or no information beyond hierarchical order. Thus, we may (with a nod to Jakobson 1935) consider structural accusative case as a marking that signals the presence of a hierarchically higher noun phrase (the subject), and the nominative as a default marking (Zwart 1988). The hierarchical relations underlying the nominative/accusative distinction are a function of Merge (cf. Zwart 2006b), but conversely, any deviations from those markings cannot be a function of Merge, but must be motivated in some other way. This 'other way' invariably refers to features that belong to the semantic component.

For example, a particular setting for the feature [animate] may enforce the realization of a particular case marking. This underlies the phenomenon of NP-split alignment, where high animate noun phrases are more likely to be marked according to a nominative/accusative

alignment, and low animate noun phrases are more likely to be marked according to an ergative/absolutive alignment (Silverstein 1976). Interestingly, this can give rise to mixed patterns, where a low animate ergative subject combines with a high animate accusative object:

(13) *Kham* (Watters 2002:68)
g̃e:h-**ye** ŋa-**lai** duhp-na-ke-o
ox-ERG I-ACC butt-1SG-PERF-3SG
'The ox butted me.'

As Watters (2002:69) discusses, these markings appear when the animacy of a particular noun phrase does not conform to the expected animacy of its grammatical function. This requires an interpretative evaluation which seems the province of LF. Likewise, the grammar of Kham makes a distinction between definite and indefinite third person pronouns, in the sense that only the former count as high animate. As Watters writes, "the distinction between definite and indefinite 3rd persons is primarily a matter of speaker construal and presupposition" in the sense that pronouns are considered definite when they are assumed to be uniquely identifiable. All this points to LF as the component where distinctions crucial to case morphological realization are being made.

In addition to animacy, specificity and definiteness may also give rise to differential case marking patterns (Malchukov and De Swart 2009:345f). For example:

(14) *Turkish* (Kornfilt 1997:219)
a. ben kitab-ı oku-du-m
I book-ACC read-PAST-1SG
'I read the book.'
b. ben kitap oku-du-m
I book read-PAST-1SG
'I read books.'

This raises the question of whether the feature specificity/definiteness in a language like Turkish (lacking determiners) is present in Narrow Syntax, or made available only at LF. In the latter case, PF must be fed by LF, since the case-marking is determined by the specificity feature value.

In all these cases it is crucial that it is not the morphology that determines the interpretation, but the morphology spells out a feature that was introduced earlier in the derivation—in this case, at LF. Naturally, these features could also be introduced in Narrow Syntax, for instance when mass or count interpretations are forced by particular feature values of the determiner, but these cases are not crucial to the proposal advanced here.

In this connection we may finally also mention systems of topic marking, such as Japanese *wa*- (as opposed to nominative *ga*-, cf. Kuno 1973:37ff), or Western Malayo-Polynesian pivot marking (as in Tagalog *ang*, cf. Schachter 1976). These can of course be accommodated in Narrow Syntax, by postulating special (left-peripheral) functional projections that bring in the required features. For Japanese, where the *wa*-phrase is a left peripheral element in the matrix clause, this seems plausible, but the same cannot be said for the pivot in languages like Tagalog, where word order is quite free (Kroeger 1993:13-14). On the approach contemplated here, the relevant information as to topicality and pivot status becomes available only at LF, and hence complications of the syntax are unnecessary.

All this suggests the generalization in (15), echoing (10):

(15) *Generalization*
Unexpected case marking is semantically motivated.

5. Ellipsis

The question of how to treat ellipsis within generative grammar is intimately related to the conceptualization of the model of grammar, and especially the interaction of the sound and meaning components in that model. We will take as our starting point a simple case of VP-deletion in English:

(16) John graduated before Bill did [$_{VP}$ --]

In (16), the empty VP is interpreted as 'graduated'. How is this to be accounted for?

The simplest account would seem to be that Narrow Syntax generates the VP *graduated* in both clauses of (16), and that some mechanism (to which we return shortly) ensures that the second instance of *graduated* is not spelled out at PF. This has become the more or less standard

analysis within minimalism since Merchant (2001). In Government and Binding theory, however, the standard analysis ran along different lines, where Narrow Syntax generates an empty VP in the embedded clause, the content of which then needed to be reconstructed at LF (Williams 1977). Clearly, this approach requires a separation of PF and LF, such that operations at LF leave no mark on PF.

The phenomenon of Antecedent-Contained Deletion (ACD), illustrated in (17), provides a strong conceptual argument in support of the minimalist PF-deletion analysis, and against the GB LF-reconstruction analysis.

(17) Dulles suspected everyone Angleton did [$_{VP}$ --]

Reconstruction requires that the embedded VP copies the material from an antecedent VP, in this case the matrix VP. In (16), this is unproblematic, as the antecedent VP contains just the intransitive verb *graduated*. But in (17) the antecedent VP actually contains the object *everyone Angleton did [$_{VP}$ --]*, including the empty VP contained inside the object. Reconstruction would therefore not result in the elimination of the gap, calling for further reconstruction, ad infinitum. The LF-reconstruction analysis of (17), then, leads to an infinite regress. On a PF-deletion analysis, no such problem arises, as the syntax simply generates (18)(Vanden Wyngaerd and Zwart 1991).

(18) Dulles suspected everyone Angleton suspected

Fiengo and May (1992) propose to salvage the LF-reconstruction analysis of ACD-constructions like (17) by assuming a rule of Quantifier Raising (QR) at LF, prior to reconstruction. This rule would raise the quantified noun phrase *everyone Angleton did* out of the matrix VP, leaving a trace (*t*):

(19) [everyone Angleton did [$_{VP}$ --]] Dulles [$_{VP}$ suspected *t*]

As a result, the empty VP can take the VP *[suspected* t *]* as its antecedent for the reconstruction of its contents. But this analysis has several problems. For one, it assumes that LF is just covert syntax, a notion discarded in minimalism. But even if LF is covert syntax, the analysis could not work, as the antecedent VP no longer c-commands the empty VP after QR, and syntactic

dependency is a function of c-command. Also, assuming the copy theory of movement (Form Copy), QR does not eliminate the empty VP but merely copies it. And finally, the analysis predicts that ACD is limited to VP-deletion inside quantified objects, which is not unequivocally the case (Vanden Wyngaerd and Zwart 1991:154).

All this makes the minimalist PF-deletion analysis more attractive, and I will assume it from here on. On this analysis, the main question becomes: how does PF know what material not to spell out? And here, clearly, semantic factors and aspects of discourse/information structure are supremely relevant.

To see this, consider the analysis of VP-deaccenting and VP-ellipsis in Tancredi (1992). Tancredi argues that both phenomena are conditioned by an operation that identifies on the one hand a set of foci and on the other hand what he terms a 'focus related topic', the latter a candidate for deaccenting and ellipsis. Thus in (16), *John* and *Bill* are the foci, and '*x* graduated' is the focus related topic. The focus related topic is a phrase (or set of phrases) with the foci replaced by variables (Tancredi 1992: 43, 79). Clearly this is an operation that belongs to the LF-component.

A direct relation between syntax and PF, without mediation by LF, becomes problematic in view of cases like (20), with high pitch indicated by small caps:

(20) JOHN wrote A PAPER about ellipsis and BILL A BOOK

Here the focus related topic would be something like [*x* write *y* about ellipsis], where *write about ellipsis* is not a constituent. A syntactic division into foci and focus related topic based on constituency is therefore not automatic.

As Tancredi (1992) is well aware, deletion differs from deaccenting in being subject to a stricter condition of identity between the antecedent and the deleted element. But this condition is not absolute, and it is here that LF once again becomes relevant. Consider examples like:

(21) Biden believes in himself, even if Harris doesn't [i.e. she doesn't believe in Biden]

Here the deleted VP in the second clause must have been something like *believe in him* (not *believe in himself*). The focus related topic therefore must abstract away from the exact morphology of the pronouns, to create something like identity between the relevant VPs. This evaluation of identity, we submit, must also take place at LF. Once again, ellipsis at PF cannot

be understood as the outcome of a direct interaction between syntax and PF, but requires an intermediate role for LF.

6. Binding

In the Government and Binding theory, pronominal elements such as reflexives and regular pronouns were considered to be generated in syntax, and familiar conditions were formulated regulating the distribution of these elements (Chomsky 1982: 20). Thus, reflexives had to be bound (coreferential with a c-commanding antecedent) within a local domain, and regular pronouns had to be free (not coreferential with a c-commanding antecedent) within the same local domain.

There are several problems with this approach, suggesting to me that pronominal elements are underspecified in the syntax, and receive a morphological realization at PF depending on the kind of dependency that they are intended to express (cf. Levinson 2000: 261ff). On this approach, the crucial decision on how to spell out the pronouns needs to be made at the interpretive component, LF.

One of the problems with the classical binding theory is that languages differ in their inventory of pronouns (e.g. Reuland 2011: 83f). Thus, while Dutch has a special form *zich* 'himself' for third person reflexive pronouns, next to the regular pronoun *hem/haar* 'him/her', Frisian (closely related to Dutch) does not make this distinction, and uses the regular pronoun *him/har* 'him/her' in both reflexive and nonreflexive contexts (as did in fact Middle Dutch).

(22) *Dutch*

a. Kim was-t haar
   Kim wash-3SG 3SG:OBJ
   'Kim washes her.' (her ≠ Kim)

b. Kim was-t zich
   Kim wash-3SG 3SG:REFL
   'Kim washes herself.' (herself = Kim)

(23) *Frisian*

Kim waske-t har

Kim wash-3SG 3SG.OBJ

'Kim washes her/herself.' (har = or ≠ Kim)

Frisian *har*, functioning as both a reflexive and a regular pronoun, is subject to two conflicting binding conditions, requiring it to be at the same time bound and free within the same local domain. This suggests a different approach, where the pronoun is underspecified in the syntax, is marked as being reflexive or not at LF, and receives a morphological realization at PF accordingly.

On this alternative approach, reflexivity does not exist in Narrow Syntax, and is an additional piece of information generated at LF. This is consistent with the typological observation that reflexivity can be realized in a variety of ways. These include (cf. Geniušienė 1987, Schladt 2000):

(24) *realizations of reflexivity*

a. reflexive marking on the verb
b. pronominals
c. body part noun phrases
d. dedicated *self*-markers
e. dedicated auxiliaries
f. directional prepositional phrases
g. repetition of the antecedent

To illustrate just the first of these many variants:

(25) *Mohawk* (Baker 1996:50)

Sak ra-**[a]tate**-núhwe'-s

Sak MASC.SG.SU-REFL-like-HAB

'Sak likes himself.'

The generalization that suggests itself is that reflexivity is marked on the predicate, and that (24) lists various ways in which the predicate can be morphologically marked to express reflexivity

(Zwart 2006c). While this can be viewed as a function of Merge, the interpretive step of marking the subject-predicate dependency as reflexive is not in and of itself a syntactic operation, but must be the province of the semantic component, LF. If so, and if morphological realization takes place at PF, LF must feed PF.

While this general perspective on reflexivity seems consistent with the model of grammar contemplated in this article, the phenomenon as a whole is obviously too vast to cover in any detail here. Yet some encouragement may still be drawn from cases of 'proxy readings' of reflexives as observed in 'duplication contexts' (Rooryck and Vanden Wyngaerd 2011: 225f), as suggested by an anonymous reviewer. These occur in situations where the anaphor refers to a duplication (an image, statue, etc.) of the referent of the antecedent (Jackendoff 1992). Languages may have specialized reflexive pronouns for these situations, e.g. Dutch *zichzelf* as opposed to *zich*. Reference to a duplicate is clearly part of the conceptualizations and intentions of the speaker, so should be marked not in Narrow Syntax, but at LF. Since this marking for the duplication reading at LF determines pronoun realization (as *zichzelf* or *zich*) at PF, once again LF must feed PF.

The classical binding theory also regulates the distribution of R-expressions. These must be free regardless of locality. This accounts for the ungrammaticality of (26a), yet Bolinger (1977) observes that subtle variation may lead to significant improvement (26b)(cf. Zwart 2015a).

(26) a. * He flunked when John cheated (he ≠ John)
b. He usually flunks when John cheats (he = John)

As Bolinger argues, discourse factors are at play here, in the sense that the referent of *he* in (26) may be made explicit if there is a need to reidentify it as the topic. Note that there is no evidence that the topic is syntactically represented in an example like (26b), e.g. in a left-peripheral TopicPhrase (cf. Rizzi 1997). This suggests that the interpretive features giving rise to repetition of the referent of *he* are not introduced in the syntax but at LF.

The relevance of this case for the relation between LF and PF is the following. The principle excluding R-expressions in situations where coreference is intended ('Principle C' of the binding theory) can be formulated as follows in the approach contemplated here, where reflexive markers are only realized at PF (see also Levinson 2000: 331):

(27) To express anaphoricity, use an anaphoric device

In (26), the anaphoric device of choice for English would be the pronoun *he* ('He flunked when he cheated'), explaining the infelicity of (26a) under the intended reading. (26b) then shows that the principle in (27) can be lifted when other considerations (having to do with the need to re-establish the topic) are at play. Since these are LF-considerations, and (27) is about morphological realization at PF, LF must feed PF in this domain as well.

7. Prosody and scope

It is well known, or at least easy to observe, that intonation and interpretation are closely connected. Thus, in (28), the ordinary wide scope of negation (28a) is canceled when the negative marker is stressed (28b).

(28) *Dutch*

a. Het kan niet WAAR zijn
   it can:SG NEG true be:INF
   'It can't be true.' (neg > can)

b. Het kan NIET waar zijn
   it can:SG NEG true be:INF
   'It can be false.' (can > neg)

Similarly, the ordinary wide scope of the quantifier *everyone* in (29a) is canceled when it is stressed (29b).

(29) a. What did everyone buy? (all > wh)
   b. What did EVERYONE buy? (wh > all)

The question now is, is the scope interpretation affected by the pitch, or is the pitch a prosodic realization of the scope interpretation.

The standard model, in which PF and LF are separated, is not compatible with either scenario. For the scope interpretation to be affected by the pitch, then, a feature would have to be present in the syntax, that would lead to a prosodic effect at PF and to a corresponding semantic effect at LF. The question is whether a plausible syntactic feature could be identified

to that end.

This leads to the further question: what kind of syntactic features are there (i.e. must minimally be assumed)? We assume that Merge is the only operation of Narrow Syntax. The elements merging may have inherent syntactic features (person, number, gender, tense, aspect, category perhaps). We assume that these features can be shared as a function of Merge, to account for agreement phenomena. Let us assume that features relating to polarity (incl. negation) and quantification are syntactic features. These features then must have values, leading to the following question: is the prosody in (28)-(29) a function of a certain value specification for the relevant features?

And clearly, this is not the case. The value of the polarity marker *niet* 'not' in Dutch remains the same regardless of the pitch (namely negative). The pitch reflects the workings of an additional feature that is not inherent to the polarity marker, namely focus. Similarly with the quantifier *everyone* in (29).

I submit that focus assignment is not an operation of Narrow Syntax, but of LF. It adds a dimension of information structure to the syntactic structure derived by Narrow Syntax. If so, the prosodic effect in (28)-(29) and other relevant cases must be a function of LF, and PF must again be located downstream from LF.

Note that the phenomena in (28)-(29) are not automatically explained away by postulating a syntactic projection in the clause structure (Focus Phrase) that would play a role in deriving the interpretation. This is because there is no syntactic evidence of a difference in structure between the different scope readings. The only thing that seems to happen is that the unmarked distribution of focus and ground is changed, leading to a different interpretation with a concomitant prosodic effect.

This is not to deny that focus can have an effect on word order, as demonstrated e.g. for Kukuya in Li (2024). Thus, Kukuya has an 'immediately before verb' focus position, visible in a marked SOV word order:

(30) *Kukuya* (Li 2024:160)

a. ndé á-dzwí mi-féme
   he SU:1.PAST-kill 4-pig
   'He killed some pigs.'

b. ndé mí-féme ká-dzwí
he 4-pig SU:1.PAST-kill
'He killed some PIGS.'

But the change in subject agreement morphology (*a* vs. *ka*) suggests that these sentences have different derivational histories, with the focus construction (30b) being derived from a pseudo-cleft construction, and this is in fact what Li (2024) argues. To what extent this can be generalized to other cases of focus fronting remains to be seen (see Fanselow 2006 and Green 2007:67f for pertinent discussion).

The arguments above converge on the idea that certain aspects of the interpretation of a sentence are introduced postsyntactically, at LF. These aspects relate to discourse roles and information structure, to the role of participants in the speech situation, and to the construction of what is given and new. In standard minimalist theory, these interpretational aspects are typically accounted for in Narrow Syntax, by postulating additional functional projections of phrase structure, mostly in the left periphery (e.g. Rizzi 1997). That whole architecture comes under scrutiny from the perspective contemplated here. In the most consistent implementation of the approach under consideration, leftward movement for discourse reasons is never part of Narrow Syntax, but a function of linearization of PF, informed by LF-features expressing the intentions and conceptualizations of the speaker. That is doubtless too strong a conclusion. Nevertheless, it may be possible that a significant range of the constructions now analysed as involving A'-movement could be reanalysed as involving (pseudo)clefting or left peripheral base-generation, as suggested in the references cited above. To what extent this holds across the board is beyond the scope of the present paper.

8. Operator-variable constructions

I would like to extend the line of reasoning developed in the above to one of the most venerated operations of Narrow Syntax, wh-movement (on the understanding that this is very tentative and possibly ill-advised, but still in line with the model contemplated here and not ruinous for it in case this turns out to be a bridge too far). The perspective, namely, that LF feeds PF opens up the possibility that wh-elements binding a variable are not introduced in the syntax, but at LF. This would immediately explain the fact that wh-operators are (arguably universally, Kayne

1992) left-peripheral to the remainder of the clause.

Wh-constructions are subject to a condition banning vacuous quantification, which may be formulated as a bijection principle (cf. Koopman and Sportiche 1983:146).

(31) *Bijection principle*

There is a bijective correspondence between variables and operators.

That is, every variable must have an operator, and an operator must bind a variable.

The Bijection Principle is arguably a principle of interpretability, and should therefore hold at LF. In standard minimalism, variables and operators do not exist as entities of the Numeration. The operator-variable configuration comes into being when an element undergoes internal merge (i.e. movement) to a particular (A') position. This operation yields two copies of a single element, which both need to undergo a transformation: the higher copy becomes an operator, and the lower one a variable. Exactly how these transformations work is unclear.

That this is not a trivial matter is clear from the observation that the operator *which book* and its variable (*e*) both receive a different interpretation from the element first merged, *the book*:

(32) a. John read **the book**

b. **Which book** did John read ***e***

(i.e. for which x, x a book, John read that book)

In (32b), *which book* receives an interpretation like 'for which x, x a book', and the variable receives the interpretation 'that book' (or simply: *x*). It is unclear how this works.

Alternatively, we may consider the possibility that the variable (a generic variable) is a potential member of any Numeration. For (32b), this would yield a syntactic structure like (33):

(33) John read *x*

At LF, (33) will be uninterpretable (i.e. violating (31)), but the derivation can be salvaged by merging an operator (e.g. *which book*). Arguably, 'for which *x*, *x* a book' is the meaning of that operator, so that the interpretation of (32b) is easily derived.

(34) 〈 [which book], [John read *x*]〉

A minimalist interpretation of this process would be to state that it is a one-off process: when a violation of (31) is registered at LF, one and only one operator may be merged to salvage the derivation. If so, wh-island effects immediately follow.

To see this, consider a standard case of a wh-island violation:

(35) *Which book did you wonder [when John read *e e*]

In (35), the embedded clause contains two variables, one corresponding to *which book* and another corresponding to *when*. On the assumption that operators are introduced at LF, the embedded clause will look like (36) at the end of (it's cycle of) Narrow Syntax:

(36) [John read *x x*]

Merging *when* at LF removes one unbound variable, but does not completely satisfy (31), so that the construction remains uninterpretable.

A beneficial consequence of this approach for the theory of syntax is that the left-peripheral nature of wh-operators can be explained without the need to postulate left-peripheral functional wh-projections for this purpose.

It should be pointed out that this approach to wh-islands breaks with a long tradition of deriving locality effects from more or less arbitrarily defined local domains (of which the Phase Theory of Chomsky 2001 is the latest instantiation, rephrasing earlier insights of Chomsky 1986, 1973). What is missing from this tradition is a fundamental definition of 'local domain', i.e. one that is somehow inescapable. I have argued elsewhere that the concept of derivation layering provides a more fundamental definition of 'local domain', which is readily applicable to a range of locality effects that are hard to handle within a phase-based approach (such as subject islands, adjunct islands, and coordinate islands; Zwart 2009, section 5). The admittedly tentative proposal in this section, of handling wh-island effects at the interfaces rather than in Narrow Syntax, is a further implementation of this line of research that attempts to derive locality from the fundamentally punctuated nature of syntactic derivations.

That said, if this is the right approach to wh-movement (now a misnomer), PF must be fed by LF, as wh-operators are merged at LF and realized at PF.

9. Second position phenomena

It is a robust phenomenon across the Germanic languages, but also widespread beyond, that wh-movement triggers movement of the finite verb to the position right adjacent to the wh-element. This is exemplified by the auxiliary *did* in (32b), and by the finite verb in Dutch (37).

(37) *Dutch*

Welk boek lees-t Jan?
which book read-3SG John
'Which book does John read?'

Now if merger of wh-elements takes place postsyntactically, as we have suggested, and it triggers the verb placements in (32b) and (37), the latter must also take place postsyntactically, arguably at PF (which deals with linear order).

The idea that verb movement takes place at PF was first proposed in Chomsky (2001), mainly on conceptual grounds. The main arguments were that head movement cannot be reduced to Merge (as it violates the 'extension condition' limiting Merge to the root node of the structure), and that it yields no semantic effect. To this we can add the argument of Zwart (2017), who observes that the idea of postsyntactic morphology (where verb forms spell out features accumulated by the verb during the syntactic derivation) has nontrivial consequences in this domain. This is because the periphrastic past of languages like Dutch must be regarded as just one of the possible morphological realizations of the VERB (recall that VERB stands for the complex consisting of the verbal root and the other components of the verb, merged together in a previous derivation and entered into the Numeration for the clausal derivation as a single item, ending up as a terminal of Narrow Syntax at the end of the clausal derivation). In other words, the auxiliary that we see in the periphrastic past does not correspond to an independent functional head (Aux, or Infl, or T), as is the common idea in weak lexicalist approaches to morphosyntax (e.g. Wurmbrand 2001). On the contrary, the auxiliary is just part of whatever the morphological component returns in order to lexicalize a VERB with the appropriate features (anteriority or 'relative tense'; see Zwart 2017 for arguments against the traditional view that the auxiliary must be viewed as an independent syntactic item).

If so, the observation in (38) forces us to conclude that verb movement takes place at PF.

(38) *Dutch*

Welk	boek	heef-t	Jan	ge-lez-en ?
which	book	AUX:3SG	John	GE-read-PART

'Which book did John read?'

This is because the auxiliary *heeft* 'has', which occupies the 'verb-second' position right adjacent to the left-peripheral wh-element *welk boek* 'which book', is only introduced at PF, as part of the realization of a VERB by a periphrastic form.

Word order determined by information structure, topic/focus organization, semantic 'strength' (of indefinites, for example), etc. is a vast subject that I cannot do justice here. If anything, the ideas explored in this article suggest an alternative to the prevalent approach to these phenomena, which capitalizes on a presumed universal cartography underlying the structure of the clause as generated in Narrow Syntax by Merge.

10. Architecture

This article has argued for a revision of the model of grammar assumed in current minimalism, in which PF is ordered after LF, and LF assumes much of the responsibility for the semantic aspects of syntax. Thus, we have seen that aspects of the grammar having to do with information structure, speech situation, scope, and variable binding, which arguably relate to an added dimension on top of the hierarchical structure generated by Merge, may have to be located at the interface component LF. Since these grammatical aspects often drive PF-externalization, in terms of inflectional morphology, prosody, and linear order, PF must be positioned downstream from LF in the model of grammar.

This then leads to a model as in (39).

(39)

Numeration

>>

Narrow Syntax

>>

LF

>>

PF

So far we have considered derivations to be nonrecursive, but this is clearly wrong (Zwart 2009, 2011, 2015b). Elements in the Numeration may have their own derivational history, if only because of the existence of complex words. This assumes a principle of uniformity, stating that there is just one structure building operation in the model of grammar (Merge).

(40) *Uniformity*
All structure is derived by Merge

The uniformity principle implies that complex words (e.g. compounds, but also the VERB) must be derived by Merge as well. Let us strengthen this and say that every complex element must be derived by a 'grammar' consisting of the three components discussed at the outset of this article:

(41) Numeration >> Merge >> Externalization

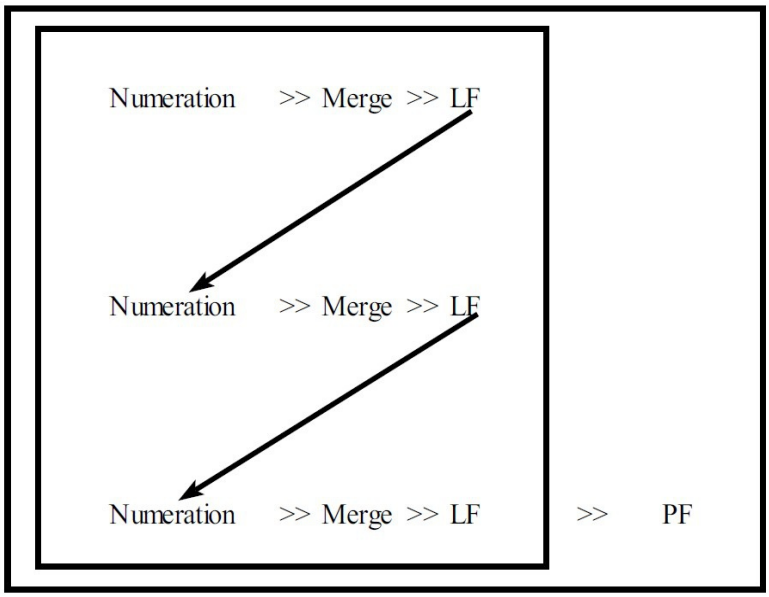
Every derivation, then, is a network of derivations each structured as in (41).

But this leads to a problem, that is happily solved by the proposal made in this article, namely that PF is located after LF. The problem is that the elements in the Numeration, in this model, are not actual words, with sonic representations, but sets of features (i.e. roots and functional elements). The sounds of the words/morphemes do not come into play until the Externalization component, more particularly PF. This allows us to generalize across languages, and to characterize Merge in abstraction from language specific features of the elements involved.

But on the assumption that derivations are networks of derivations, all ordered as in (41), we arrive at a paradox if the Externalization component of each subderivation includes PF. For in that case, the output of a subderivation would be endowed with sonic features, and the Numeration for the next derivation would be a mix of abstract syntactic features and concrete phonological features. Do we really want a complex element (a compound or a VERB, etc.) to be present in the Numeration with all its sound properties, including inflectional morphology and prosodic contours, while other elements are just collections of abstract features?

This paradox can be resolved if LF and PF are sequentially ordered within the Externalization component. For then the recursive step could be taken after LF and before PF, and PF would be accessed only at the very end of the total derivation.

(42)



A layered derivation model incorporating the standard separation of LF and PF, both fed directly by the syntactic component (Merge), would not be able to accomplish this.

It should be pointed out that the model of grammar contemplated here, in which LF feeds PF, is not to be confused with earlier generative models in which semantics drives all of syntax ('Generative Semantics'). The core operation of Narrow Syntax, Merge, is not semantically driven, but generates hierarchical structures that are interpreted by the interface components (sequentially by LF and PF, if I am on the right track). Lexical semantic properties, such as thematic roles (or rather, the PR-features of Talsma 2025), contribute to the way these structures are interpreted, but do not themselves drive Merge. This is an important distinction with models of semantically driven syntax. It is precisely the idea that Merge is blind to semantics, in particular to the intentions and conceptualizations of the speaker, that motivates the adjustment of the model of grammar argued for here.

11. Conclusion

In this article I have argued that information reflecting the conceptualizations and intentions of the speaker should not be represented as formal features in Narrow Syntax, but only enter the derivation of a sentence at the conceptual/intentional interface component LF. These features typically reflect a point of view of the speaker, regarding animacy, specificity, honorificity, and

other features not directly reflected in the feature make-up of clausal constituents, as well as everything to do with the discourse situation, information structure, and pragmatics.

These features typically affect morphological realization (via case, agreement, choice of pronouns, etc.), linear order, and prosody, all properties of the clause regulated at the sensory/motor interface component PF. This leads to the conclusion that the current conception of the model of grammar, in which Narrow Syntax interfaces with PF and LF directly, and PF and LF do not interact, must be revised, to the effect that Narrow Syntax feeds LF, and LF feeds PF.

The perspective sketched here is at variance with a long-standing research tradition in generative grammar, where Narrow Syntax is enriched with functional projections hosting the features relevant to the conceptualizations and intentions of the speaker (such as Topic Phrases and Focus Phrases, and similar functional projections, in e.g. Rizzi 1997). This approach typically necessitates the postulation of covert movement (at LF) of elements associated with the relevant features which happen to occupy syntactic positions at some remove from these postulated functional projections.

If we are on the right track with the model of grammar contemplated here, such functional projections and covert movements need no longer be entertained, leading to a considerable simplification of the model, with concomitant advancement in our understanding of the human language faculty.

References

Baker, Mark C. 1996. *The polysynthesis parameter*. New York: Oxford University Press. https://doi.org/10.1093/oso/9780195093070.001.0001

Barlow, Michael. 1999. Agreement as a discourse phenomenon. *Folia Linguistica* 33, 187-210. https://doi.org/10.1515/flin.1999.33.1-2.187

Béjar, Susana and Milan Rezac. 2009. Cyclic Agree. *Linguistic Inquiry* 40, 35-73. https://doi.org/10.1162/ling.2009.40.1.35

Van den Berg, Helma. 1999. Gender and person agreement in Akusha Dargi. *Folia Linguistica*

33, 153-168.
https://doi/org/10.1515/flin.1999.33.1-2.153

Van den Berg, René. 1989. *A grammar of the Muna language*. PhD dissertation, Leiden University.

Bhattacharya, Tanmoy. 2011. Speaker-hearer in a clause: the case of addressee agreement. Paper presented at Trondheim University, October 7.

Bokamba, Eyamba G. 1980. Verbal agreement as a non-cyclic rule in Bantu. *Papers from the 16th Annual Meeting of the Chicago Linguistic Society*, 10-29.
https://doi.org/10.1075/ssls.6.05bok

Bolinger, Dwight. 1977. *Pronouns and repeated nouns*. Bloomington: Indiana University Linguistics Club.

Branigan, Phil and Marguerite MacKenzie. 2002. Altruism, A'-movement and object agreement in Innu-aimûn. *Linguistic Inquiry* 33, 385-407.
https://doi.org/10.1162/002438902760168545

Chomsky, Noam. 1973. Conditions on transformations. In Stephen R. Anderson and Paul Kiparsky, eds., *A Festschrift for Morris Halle*, 232-286. New York: Holt, Rhinehart and Winston.

Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris.
https://doi.org/10.1515/9783110884166

Chomsky, Noam. 1982. *Some concepts and consequences of the theory of Government and Binding*. Cambridge: MIT Press.

Chomsky, Noam. 1986. *Barriers*. Cambridge: MIT Press.

Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge: MIT Press.

https://doi.org/10.7551/mitpress/9780262527347.001.0001

Chomsky, Noam. 2000. Minimalist inquiries: the framework. In Roger Martin, David Michaels, and Juan Uriagereka, eds., *Step by step: essays on minimalist syntax in honor of Howard Lasnik*, 89-155. Cambridge: MIT Press.

Chomsky, Noam. 2001. Derivation by phase. In Michael Kenstowicz, ed., *Ken Hale: a life in language*, 1-52. Cambridge: MIT Press.
https://doi.org/10.7551/mitpress/4056.003.0004

Chomsky, Noam, T. Daniel Seely, et al. 2023. *Merge and the Strong Minimalist Thesis*. Cambridge: Cambridge University Press.
https://doi.org/10.1017/9781009343244

Collins, Chris. 2024. *Principles of Argument Structure: a Merge-based account*. Cambridge: MIT Press.
https://doi.org/10.7551/mitpress/15436.001.0001

Corbett, Greville. 2006. *Agreement*. Cambridge: Cambridge University Press.

Culicover, Peter and Ray Jackendoff. 2005. *Simpler syntax*. Oxford: Oxford University Press.

Fanselow, Gisbert. 2006. On pure syntax (uncontaminated by Information Structure). In Patrick Brandt and Eric Fuss, eds., *Form, structure, and grammar: a Festschrift presented to Günther Grewendorf on occasion of his 60th birthday*, 137-158. Berlin: Akademie Verlag.
https://doi.org/10.1524/9783050085555.137

Fiengo, Robert and Robert May. 1992. *Indices and identity*. Cambridge: MIT Press.

Genušienė, E. 1987. *The typology of reflexives*. Berlin: Mouton de Gruyter.

Green, Melanie. 2007. *Focus in Hausa*. London: Blackwell.

Hale, Kenneth and Samuel J. Keyser. 1993. On argument structure and the lexical expression of syntactic relations. In Kenneth Hale and Samuel J. Keyser, eds., *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger*, 53-110. Cambridge: MIT Press.

Halle, Morris and Alec Marantz. 1993. Distributed Morphology and the piees of inflection. In Kenneth Hale and Samuel J. Keyser, eds., *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger*, 111-176. Cambridge: MIT Press.

Inkelas, Sharon and Draga Zec, eds. 1990. *The phonology-syntax connection*. Chicago: The University of Chicago Press.

Jackendoff, Ray. 1992. Mme Tussaud meets the Binding Theory. *Natural Language and Linguistic Theory* 10, 1-31.
https://doi.org/10.1007/BF00135357

Jakobson, Roman. 1935. Beitrag zur allgemeinen Kasuslehre. In Eric P. Hamp, Fred W. Householder and Robert Austerlitz, eds., 1966, *Readings in linguistics 2*, 51-89. Chicago: The University of Chicago Press.

Kayne, Richard S. 1992. Word order. Keynote lecture at the GLOW Colloquium, Lisbon, April 14.

Koopman, Hilda and Dominique Sportiche. 1983. Variables and the bijection principle. *The Linguistic Review* 2, 139-160.
https://doi.org/10.1515/tlir.1982.2.2.139

Kornfilt, Jaklin. 1997. *Turkish*. London: Routledge.
https://doi.org/10.4324/9781315823652

Kroeger, Paul. 1993. *Phrase structure and grammatical relations in Tagalog*. Stanford: CSLI Publications.

Kuno, Susumo. 1973. *The structure of the Japanese language*. Cambridge: MIT Press.

Levinson, Stephen C. 2000. *Presumptive meanings: the theory of generalized conversational implicature*. Cambridge: MIT Press.
https://doi.org/10.7551/mitpress/5526.001.0001

Li, Zhen. 2024. *Word order, information structure and agreement in Teke-Kukuya*. PhD dissertation, Leiden University.
https://dx.medra.org/10.48273/LOT0677

Malchukov, Andrej and Peter de Swart. 2009. Differential case-marking and actancy variation. In Andrej Malchukov and Andrew Spencer, eds., *The Oxford Handbook of Case*, 339-356. Oxford: Oxford University Press.
https://doi.org/10.1093/oxfordhb/9780199206476.013.0023

May, Robert. 1985. *Logical Form*. Cambridge: MIT Press.

Merchant, Jason. 2001. *The syntax of silence: sluicing, islands, and the theory of ellipsis*. Oxford: Oxford University Press.

Miyagawa, Shigeru. 2012. Agreements that occur mainly in the main clause. In Lobke Aelbrecht, Liliane Haegeman and Rachel Nye, eds., *Main clause phenomena: new horizons*, 79-111. Amsterdam: John Benjamins.
https://doi.org/10.1075/la.190.04miy

Nikolaeva, Irina. 2001. Secondary topic as a relation in information structure. *Linguistics* 39, 1-50.
https://doi.org/10.1515/ling.2001.006

Ott, Willis and Rebecca de Burke Ott. 1983. *Diccionario ignaciano e castellano con apuntes gramaticales*. Cochabamba: Instituto Lingüístico de Verano.

Pandharipande, Rajeshwari V. 1997. *Marathi*. London: Routledge.
https://doi.org/10.4324/9780203168547

Polinsky, Maria and Bernard Comrie. 1999. Agreement in Tsez. *Folia Linguistica* 33, 109-130. https://doi.org/10.1515/flin.1999.33.1-2.109

Polinsky, Maria and Eric Potsdam. 2001. Long-distance agreement and topic in Tsez. *Natural Language and Linguistic Theory* 19, 583-646. https://doi.org/10.1023/A:1010757806504

Rizzi, Luigi. 1997. The fine structure of the left periphery. In Liliane Haegeman, ed., *Elements of grammar*, 281-337. Dordrecht: Kluwer. https://doi.org/10.1007/978-94-011-5420-8_7

Rooryck, Johan and Guido Vanden Wyngaerd. 2011. *Dissolving Binding Theory*. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199691326.001.0001

Saeed, John I. 1993. *Somali reference grammar*. Kensington: Dunwoody Press.

Schachter, Paul. 1976. The subject in Philippine languages: topic, actor, actor-topic or none of the above. In Charles Li, ed., *Subject and topic*, 491-518. New York: Academic Press.

Schladt, Mathias. 2000. The typology and grammaticalization of reflexives. In Zygmunt Frajzyngier and Traci S. Curl, eds., *Reflexives: form and functions*, 103-124. Amsterdam: John Benjamins. https://doi.org/10.1075/tsl.40.05sch

Silverstein, Michael. 1976. Hierarchy of features and ergativity. In R.M.W. Dixon, ed., *Grammatical categories in Australian languages*, 112-171. New Jersey: Humanities Press. https://doi.org/10.1515/9783110871661-008

Stump, Gregory and Ramawatar Yadav. 1988. Maithili verb agreement and the Control Agreement Principle. *CLS* 24.2, 304-321.

Talsma, Marjolein Wietske. 2025. *Argument structure as a function of Merge: from UTAH to*

IDAHO. PhD dissertation, University of Groningen.

Tancredi, Christopher. 1992. *Deletion, deaccenting, and presupposition*. PhD dissertation, MIT.

Thráinsson, Höskuldur. 2007. *The syntax of Icelandic*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511619441

Watters, David. 2002. *A grammar of Kham*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511486883

Williams, Edwin. 1977. Discourse and Logical Form. *Linguistic Inquiry* 8, 101-139.

Wiltschko, Martina. 2021. *The grammar of interactional language*. Cambridge: Cambridge University Press.
https://doi.org/10.1017/9781108693707

Wurmbrand, Susanne. 2001. *Infinitives: restructuring and clause structure*. Berlin: Mouton de Gruyter.
https://doi.org/10.1515/9783110908329

Vanden Wyngaerd, Guido and Jan-Wouter Zwart. 1991. Reconstruction and Vehicle Change. *Linguistics in the Netherlands 1991*, 151-160. Amsterdam: John Benjamins.
https://doi.org/10.1075/avt.8.18van

Yadav, Ramawatar. 1997. *A reference grammar of Maithili*. New Delhi: Munsiram Manoharlal.
https://doi.org/10.1515/9783110811698

Zec, Draga and Sharon Inkelas. 1990. Prosodically constrained syntax. In Inkelas & Zec, eds., 365-378.

Zwart, Jan-Wouter. 1988. The first case: the nominative as a default case and consequences for control theory. MA-thesis, University of Groningen.

Zwart, Jan-Wouter. 2006a. Local agreement. In Cedric Boeckx, ed., *Agreement systems*, 317-339.
https://doi.org/10.1075/la.92.14zwa

Zwart, Jan-Wouter. 2006b. Structural case and dependency marking: a neo-Jakobsonian view. *Papers from the 42nd Annual Meeting of the Chicago Linguistic Society*, vol. 2, 77-92.

Zwart, Jan-Wouter. 2006c. Baker's Generalization in a derivational theory of binding. Ms., University of Groningen.

Zwart, Jan-Wouter. 2009. Prospects for top-down derivation. *Catalan Journal of Linguistics* 8, 161-187.
https://doi.org/10.5565/rev/catjl.146

Zwart, Jan-Wouter. 2011. Recursion in language: a layered derivation approach. *Biolinguistics* 5, 43-56.
https://doi.org/10.5964/bioling.8829

Zwart, Jan-Wouter. 2015a. Precede and command revisited revisited. *Language* 91, e169-178.
https://doi.org/10.1353/lan.2015.0045

Zwart, Jan-Wouter. 2015b. Top-down derivation, recursion, and the model of grammar. In Andreas Trotzke and Josef Bayer, eds., *Syntactic complexity across interfaces*, 25-42. Berlin: De Gruyter.
https://doi.org/10.1515/9781614517900.25

Zwart, Jan-Wouter. 2017. An argument against the syntactic nature of head movement. In Laura R. Bailey and Michelle Sheehan, eds. *Order and structure in syntax vol. 1: word order and syntactic structure*, 29-47. Berlin: Language Science Press.
https://doi.org/10.5281/zenodo.1117686