

# Chapter 7

## Heads and history

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This paper considers and compares the status of the concept of head within different grammatical frameworks (Minimalism, LFG and HPSG) and its relevance to our understanding of the mechanisms of change involved in grammaticalization. Our data is drawn from the developments of lexical prepositions into grammatical prepositions and complementisers in Romance and Germanic. We argue in favour of a non-derivational approach and in particular against accounts in which all developments are mediated through a chain of functional heads of the kind deployed in cartography and nanosyntax.

### 1 Introduction

Heads come in two kinds: lexical and functional. While the former are treated in a largely uniform way across theoretical frameworks, with the latter things are different. Functional heads have been reified as a core theoretical construct within Minimalism, where they abound particularly, but not exclusively, in the cartographic version, but have much less presence in a non-derivational framework like Lexical-Functional Grammar (LFG) and an even more reduced role in Head-Driven Phrase Structure Grammar (HPSG). The difference between the two kinds of heads also plays out in the diachronic domain. Nouns, verbs and adjectives often have consistent historical trajectories over centuries. Many of the nouns of modern English, for example, were also nouns a millennium ago in Old English even if they have undergone extensive phonological and semantic change in the



meantime. The diachronic profiles of items that realise functional heads are very different, since, typically, they start out as full lexical words before developing into a grammatical item. English *will* is a good case in point, having begun life as a lexical verb meaning ‘want’ before becoming the temporal/modal marker that it is today and, in some approaches, being assigned a structural position under a node such as T or I. The key question then becomes: how do diachrony and synchrony interact, and in particular how is the historical relation between lexical and functional categories treated, in different grammatical frameworks? In the present paper, we seek to compare and contrast LFG, HPSG and Minimalism as models of (morpho)syntactic change. Our chosen dataset is the linked evolution of prepositions and complementisers in a range of Romance and Germanic languages, but we hope and believe that the conclusions we will draw on the basis of this evidence will extend both to other categories and to other languages and families.

## 2 Grammaticalisation and category change

The phenomena that we will examine in this paper fall under the general heading of grammaticalisation, classically defined by Meillet (1912: 131) as “l’attribution du caractère grammatical à un mot jadis autonome [the attribution of a grammatical value to a formerly autonomous word]” and by Kuryłowicz (1965: 69) as “the increase of the range of a morpheme advancing from a lexical to a grammatical or from a less to a more grammatical status”. We should be clear at the outset that such definitions seek to identify a phenomenon or a mechanism of change. Grammaticalisation is a descriptive label and not a theoretical construct, *pace* the locution “grammaticalisation theory” that is to be found from time to time in the literature, for instance in the positive reference by Haspelmath (1989: 318) to the “explanatory standards of grammaticalization theory”. There are two properties which characterise such changes: the first is the fact that they recur within the histories of unrelated languages. In our introduction, for example, we cited the case of the English future auxiliary *will*, which derives from the Old English *willan* ‘want’. A similar shift is to be seen in the use of the Romanian verb *a vrea*, etymologically the reflex of Latin *velle* ‘want’, to signal futurity, in similar uses of the ‘want’ verb elsewhere in the Balkans (Albanian, Croatian, Greek), in the Swahili future prefix *-ta-* originating in the verb *taka* ‘want’, and in parallel developments in a number of other languages (Heine & Kuteva 2002). The second property is the unidirectionality – or at least overwhelming asymmetry in direction – of such changes; thus, we find many instances of volition verbs be-

coming future tense markers, but none of futures turning into verbs of volition (see Börjars & Vincent 2011 for further discussion and exemplification).

To the claimed existence of grammaticalisation there have been two broad classes of response. One is to deny its place as a special and separately identifiable category among the general processes of reanalysis that characterise morphosyntactic change (see amongst others Campbell 2001; Joseph 2001; Newmeyer 2001). The alternative is to accept that grammaticalisation exists and to seek to model it in theoretical terms. This, in very different ways, is what has been done by Heine et al. (1991), Roberts & Roussou (2003), van Gelderen (2011) and Traugott & Trousdale (2013), and it is within this latter class of approaches that the present paper also falls. A central issue then becomes the nature of the theoretical constructs that are assumed. Roberts & Roussou (2003), for example, operate within a framework which permits synchronic analyses involving movement upwards from a lexical head to a functional head but not downwards from functional to lexical – a principle of Universal Grammar (UG) which appears to mimic, and has been argued to explain, the directionality of change from lexical to grammatical but not vice versa implicit in Meillet's and Kuryłowicz's definitions. LFG and HPSG, by contrast, do not include movement within their theoretical inventories.

### 3 Prepositions and complementisers in diachrony

When it comes to categories and category change, prepositions are distinctive in two complementary, but as we will suggest connected, ways. From a synchronic point of view they appear to straddle the boundary between lexical items with their own semantic content – as in contrasting pairs such as *on* and *off*, *under* and *over*, *to* and *from* – and functional items such as the various ways of marking arguments of adjectives and verbs: *proud of*, *convince someone of*, *keen on*, *rely on*, *similar to*, *give to* or *different from*, *differ from*. (For more discussion in relation to a variety of languages, see the papers in Saint-Dizier 2006; Asbury et al. 2008; François et al. 2009; Cinque & Rizzi 2010.) At the same time there is also evidence that they all behave in ways akin to other functional items in acquisitional and pathological contexts. In this connection, the results of Froud's (2001) study of an aphasic patient are particularly striking and have led some to conclude that all prepositions should be treated as functional heads. A different but related contrast is that between open and closed classes. Many languages are like English in having a group of typically monosyllabic items that have high textual frequencies, plus a more open class of polysyllabic and syntactically complex items such as *across*, *behind*, *against*, *in front of*, *by virtue of* and the like which share the distribution of, and may alternate with, the monosyllabic items.

Diachronic considerations complicate the picture even further: polysyllables may shorten into monosyllables as a result of sound change (*over* > *o'er* in some dialects); simple and complex forms may contrast (*for* vs *against*, *behind* vs *in front of*) and once independent forms may fuse or lose syntactic and semantic content (*because* < *by cause*, *beside* < *by side*, *in light of*, *by virtue of*). In the historical context, prepositions are also remarkable because of the sheer variety of their etymological origins. Whereas temporal and aspectual markers are, for the most part, derived from independent verbs, prepositions can emerge from a variety of categorial sources. Thus, among the items that we will consider in more detail below, the Swedish and Danish prepositions *till* and *til* ‘to, towards’, are descended from a noun meaning ‘goal’ and are cognate with the German noun *Ziel* ‘goal, target’. As such, in origin they were accompanied by nouns in the genitive as the case which typically marks nominal dependents. A trace of this can be seen in the final -s which survives in such fixed expressions as Danish *til sengs* ‘to bed’ and Swedish *till sjöss* ‘at sea’. A similar effect is to be seen with the Latin items *causa* ‘because of’ and *gratia* ‘thanks to’, which have clear nominal origins and are the only Latin adpositions to govern the genitive case. And with prepositions too, we find recurrent patterns developing independently within different languages. For example, the items *hos* ‘at, with’ in Swedish and Danish and French *chez* ‘at, with’ are both descended from nouns meaning ‘house, household’ (Plank 2015), and are often contrasted with the Swedish/Danish noun *hus* and the fact that Latin *casa* ‘hut’ has stayed as the usual word for ‘house, home’ in Italian and Spanish.

In other instances, prepositions may stem from independent adverbial particles which acted as specifiers for particular case forms. This is particularly relevant for the items on which we focus below. Thus, Latin *ad* ‘to, towards’, and the infinitival markers in Swedish *att* and Danish *at*, all descend from a Proto-Indo-European particle \**ad* ‘at, near’, hence the fact that the Latin preposition takes the accusative case, in origin used in a directional sense. By contrast Latin *de* comes from a particle meaning ‘down, away from’ and so occurs with the ablative, where the latter fuses earlier distinct locative and ablative cases (Vincent 1999; 2017).

In addition to nouns, particles and reduced complex structures of the *behind* type, prepositions may also derive from a range of non-finite verb forms, as with French *pendant* ‘during’ < Latin *pendentem* ‘hanging’, pres participle of *pendeo*, English *including*, Italian *presso* ‘near’ < Latin *prehensus*, past participle of *prehendere* ‘take’, Danish *blandt* ‘among’ < *blandet*, past participle of *blande* ‘mix’, Sicilian *agghiri* ‘towards’ < *ad jiri* ‘to go.INF’. Similar in function to participles

and also possible etyma for prepositions are adjectives as in Italian *vicino* ‘near’ < Latin *vicinum*, or English *near*.

Complementisers exhibit a similar diversity of etymological sources including demonstrative pronouns as with English *that*, Swedish finite *att* and Estonian *et*, interrogative/relative pronouns as with French *que* (< Latin *quid* ‘what’) and Greek *oti*; nouns as for instance Korean *kēs* < ‘thing’ used with finite clauses; and verbs, especially verbs of saying, e.g. Yoruba *kpé*, Uzbek *deb* and Turkish *diye* (Kehayov & Boye 2016: 870–874). As we shall see in what follows, they may also evolve from prepositions as in the case of French *à* and be linked to infinitives, and corresponding patterns elsewhere in Romance, Swedish infinitival *att* and Danish *at*, English *to* and German *zu*, Irish *go* and Basque *-ela*; with the exception of *de* and its cognates, all of these are derived from allative prepositions. Within the literature such patterns have led some scholars to postulate an intermediate category of “prepositional complementiser” (Borsley 1986; 2001; Kayne 1999 and see §7 below). In this context, too, the directionality property is evident in that, while a preposition may over time acquire complementizing functions, the reverse development is not attested.

## 4 Heads and diachrony across frameworks

The evidence of diachrony has figured very differently within the frameworks under consideration here. The fact of language change and its implications for general linguistic theory have figured as core issues within the Chomskyan tradition ever since the seminal work of Lightfoot (1979). By contrast, there has to date been relatively little work from a diachronic perspective within LFG – but see the contributions to Butt & King (2001) for some examples and Börjars & Vincent (2017) for a general overview – and virtually nothing within HPSG. And yet in different ways both these last-mentioned approaches have much to offer historical linguists. In the first place, the absence of an assumption of an innate UG makes them easier to reconcile with the historical datasets derived from usage-based approaches without giving up on the commitment to formal modelling.<sup>1</sup> Secondly, their less rigid approach to phrase structure and their readiness

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<sup>1</sup>As one of our reviewers reminds us, there is no inherent incompatibility between a belief in the existence of an innate UG and the assumptions of LFG and HPSG. And there are also a range of views within the Minimalist community as to what exactly is to be ascribed to UG. However, the fact remains that, as far as we are aware, no variant of Minimalism abandons UG in its entirety whereas within the HPSG and LFG communities there is general agreement that grammatical descriptions and explanations do not require the postulation of any innate components of language.

to recognise other dimensions of linguistic information makes them able more readily to accommodate linguistic diversity, including that which is the result of change (Evans & Levinson 2009: 475).

Let us begin then by comparing the types of category that are available within the different frameworks, with an eye particularly to the differences between the sub-types of non-lexical category since it is at that point that they most obviously diverge from each other. In this respect, Minimalism is in principle the most straightforward, since it presupposes a simple contrast between lexical heads (at least N, V, A; Baker 2003: 303–325) and functional heads. Constituency trees are always binary and consist of a head (lexical or functional) plus its complement; lexical heads are always dominated by one or more functional projections and typically move from a lower base-generated position to a higher functional one in the course of a derivation. The system is thus apparently strictly constrained, but in fact the restrictions in one part of the tree lead to considerable analytical freedom elsewhere, since the inventory of functional heads is large and seemingly unconstrained, particularly in the cartographic variant of the approach. And while some such heads have names at least which suggest a semantic basis – T(ense), Mod(al), D(et), etc. – others seem to be there only to facilitate the necessary movements or to provide an intermediate location for arguments but which do not have any overt phonological exponence, as with so-called “small” vP and nP. Moreover, all heads can in principle be empty or be occupied by silent items, so the possible analytical space is in practice quite unconstrained.<sup>2</sup>

When it comes to LFG, the opposite state of affairs obtains. More basic types of category are available and there are no constraints barring non-binary or non-headed configurations. On the other hand the inventory of functional heads deployed is generally assumed to be very limited and null heads are wherever possible avoided. Table 7.1 sets out in tabular form the categories recognised within this framework.

In the most constrained versions of LFG, a functional category is postulated only when a feature comes to be associated with a structural position within a particular language, but there is no expectation that such categories are of universal validity (Kroeger 1993: 6–7; Börjars et al. 1999). Much of the work that is done by such categories in a model like Minimalism – for example in the domains of tense and modality – is instead handled within the f-structure (where “f” stands for functional in a different sense!), which is parallel to the c(onstituent)-structure. The functional categories most commonly assumed are C, I and D, and

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<sup>2</sup>A more constrained approach to categorial structure within a derivational framework is the Universal Spine explored in Wiltschko (2014). Lack of space forbids further consideration of this approach in the present context but for some discussion see Vincent (2018).

Table 7.1: Types of category in LFG

Lexical	Functional	Non-projecting (P̂)
“full” semantics: have PRED feature	“weak” semantics: no PRED feature	may have “full” semantics
projects to XP	projects to XP “extension” of lexical category; functional co-head	does not project adjoins to X <sup>0</sup>

on such a view the natural diachronic trajectory is for a structure like DP to gradually emerge or “grow”; definiteness first becomes associated with a category D and in due course with a particular structural position and hence as heading a DP where formerly there was an autonomous NP (Börjars et al. 2016). A different kind of construct within LFG is what, following Toivonen (2003), have come to be known as non-projecting words (notated  $\hat{X}$ ). Items in this class are of category X<sup>0</sup> but do not project to X' or XP, they are marked as such in the lexicon and are head-adjoined to an associated and projecting X<sup>0</sup>. Toivonen's (2003) case study focuses on Swedish particles such as *ihjäl* ‘to death’ in the string *slå ihjäl* ‘kill’, lit. ‘beat to death’, where *slå* is of the category V<sup>0</sup>, as is the whole string, but where *ihjäl* is a non-projecting P. As she demonstrates, the items that fall within the class of particles belong to a number of different categories – verbal, nominal, adjectival and prepositional – but what they have in common is that they adjoin to another item, to which in effect they cede head status. What Toivonen does not observe, but which is striking once the diachronic perspective is adopted, is that most if not all the items she categorises as non-projecting in this sense are themselves historically derived from full projecting categories or even phrases. The form *ihjäl*, for example, is a frozen version of the original PP *i hel* ‘in the land of the dead’.<sup>3</sup>

When we come to HPSG, beside full lexical heads stands the category of transparent head (Flickinger 2008), that is to say an item which determines the overall category of the phrase it heads but does not add any semantic content (in the sense defined below) of its own. A case in point is the English complementiser *that*, which heads and defines a CP, but does not contribute to the semantic representation of the clause of which it is a part. Such a concept is close to if not

<sup>3</sup>A reviewer points out that some recent work within Minimalism has adopted a similar notion of non-projecting words as a way of dealing with particles (see for example Biberauer 2017).

identical with the status the same item would have in an LFG or Minimalist account. More radical, however, was the suggestion by Pollard & Sag (1994: 44–46) that such items belong to a separate category of “markers”. In their account, a marker is “a word that is ‘functional’ or ‘grammatical’ as opposed to substantive, in the sense that its semantic content is purely logical in nature (perhaps even vacuous)”. Crucially, a marker is not a head. This concept, which conforms in many respects to traditional intuitions about such items, is not, however, the preferred option. Rather, there has developed within recent HPSG work the notion of a “weak” head, defined by Abeillé et al. (2006: 156) as “a lexical head that shares its syntactic category and other HEAD information with its complement”. Table 7.2 below summarises the various notions of head within HPSG, and Table 7.3 compares the inventory of category types and their properties within LFG and HPSG.

Table 7.2: Types of category in HPSG

Full head	Transparent head	Weak head
“full” semantics: CONTENT feature	“weak” semantics: no CONTENT feature	“weak” semantics: no CONTENT feature
projects to XP	projects to XP	does not project
combines with XP	combines with XP contributes all but the CONTENT feature	combines with XP (or X') contributes only MARKING feature; shares HEAD

Table 7.3: Heads in LFG and HPSG

	LFG			HPSG		
	Lexical	Funct	Non-proj	Full	Full <sub>transp</sub>	Weak
lexical semantics	+	–	+/–	+	–	–
“borrows” lexical semantics	–	+	–	–	+	+
projects	+	+	–	+	+	–
combines with	XP	XP	X	XP	XP	XP (X')

With these concepts and categories in mind we can now ask what kinds of diachronic trajectories are predicted within the various systems and how these stack up against the empirical evidence.



## 5 Prepositions in the nominal domain

We start with the example of Swedish *till* and compare the way it can be analysed within the three frameworks under consideration in this paper. As noted above, this item begins life as a noun, so the categorial shift in the first instance is  $N > P$ . However, as the examples in (1) demonstrate, in the modern language it has acquired a range of functions.

- (1) Swedish
- a. Oscar tog tåget till Stockholm.  
Oscar take.PST train.DEF to Stockholm  
'Oscar took the train to Stockholm.'
  - b. Oscar gav boken till läraren.  
Oscar give.PST book.DEF to teacher.DEF  
'Oscar gave the book to the teacher.'
  - c. Oscar sparkade till däcket.  
Oscar kick.PST to tyre.DEF  
'Oscar gave the tyre a kick.'

In (1a), we have the directional sense consistent with its etymological source in a noun meaning 'goal', in (1b) it marks a grammatical relation, and in (1c) it behaves as an adverbial particle. Within LFG, these three uses can be modelled as in (2). Here (2a) simply states that *till* is a full preposition with its own semantic content expressed via the PRED feature and that it subcategorises for an item having the function OBJ(ect). The representation in (2b), by contrast, indicates its use to mark the grammatical relation of an oblique recipient, and (2c) is an example of a non-projecting word serving as a marker of dynamic aspect (Toivonen 2003: 142).

- (2) a. *till* P (*f* PRED) = 'till <OBJ>'  
 b. *till* P (*f* PCASE) = OBL<sub>Recipient</sub>  
 c. *till*  $\hat{P}$  (*f* ASPECT TELIC) = -  
           (*f* ASPECT DYNAMIC) = +  
           (*f* ASPECT DURATIVE) = -

Neither of the developments in (2b) and (2c), which are logically independent of each other, are possible until after the use of *till* as a preposition with a full semantics has emerged, so the diachronic sequence is  $N > P_{till} > P_{OBL}/\hat{P}$ . In other words, on this view, once we reach the P stage the change is not reflected in

the categorial head status of the item but in the kinds of f-structure that are associated with it and its projectability.

A complaint that is sometimes made about formal models by proponents of grammaticalisation theory is that these formal models cannot capture what is described as the “gradualness” of change because all they have at their disposal is a set of discrete categories (see for instance Haspelmath 1989: 330). The gradualness is more appropriately described as change in small steps, as argued by Roberts (2010). The analyses which we describe here do exactly that; they provide ways of capturing those stages between the prototypical categories that are characteristic of grammaticalisation, though as we will see, the steps here are described in functional and/or feature terms rather than through the use of a larger inventory of syntactic heads in the way that is characteristic of cartographic and nanosyntactic approaches.<sup>4</sup>

Within HPSG, the full semantic use, or what Pollard & Sag (1994) call a “predicative preposition”, is modelled as in (3).<sup>5</sup>

$$(3) \left[ \begin{array}{l} \text{prep-word} \\ \text{CAT} \left[ \begin{array}{l} \text{HEAD } \textit{prep} \\ \text{SUBJ } \langle \text{NP } \boxed{1} \rangle \\ \text{COMPS } \langle \text{NP } \boxed{2} [\textit{acc}] \rangle \end{array} \right] \\ \text{CONT} \left[ \begin{array}{l} \textit{allative-till} \\ \text{FIGURE } \boxed{1} \\ \text{GROUND } \boxed{2} \end{array} \right] \end{array} \right]$$

That is to say, it is a full independent head of the type *prep-word* with an NP complement, where the CONT feature is defined in terms of the semantic concepts of FIGURE and GROUND (Tseng 2000; 2002). The grammatical use is also of type *prep-word*, but in contrast to the allative preposition, it has no independent content value; the value for the whole phrase is instead derived from that of the NP complement (this use is referred to as “non-predicative” by Pollard & Sag 1994, and as “transparent” by Flickinger 2008, whereas Abeillé et al. 2006 describe it as a full head with “weak” semantics). This is illustrated in (4), where the values for the two CONT features are shared.

<sup>4</sup>For further discussion of the gradualness question in the verbal domain, see Börjars & Vincent (2019).

<sup>5</sup>The authors we refer to here use slightly different versions of the HPSG formalism without this affecting the general principles of the solutions. Our aim here has been to illustrate the points made by the different authors in a unified way rather than to side with any one of them on detail.

$$(4) \left[ \begin{array}{l} \textit{prep-word} \\ \text{CAT} \left[ \begin{array}{l} \text{HEAD} \quad \textit{prep} \\ \text{MARKING} \quad \textit{till} \\ \text{COMPS} \quad \left\langle \left[ \text{CAT} \quad \left[ \text{HEAD} \quad \textit{noun} \right] \right] \right\rangle \\ \text{CONT} \quad \boxed{1} \end{array} \right] \\ \text{CONT} \quad \boxed{1} \end{array} \right]$$

In that sense, the preposition is semantically “transparent” but preserves its head status and the constituent is accordingly still a PP. As Table 7.3 illustrates, in HPSG, there is also a third analysis possible, namely that of a “weak head”. This is the analysis proposed for the use of the preposition in French illustrated in (5) (Abeillé et al. 2006: 150), but it is not clear whether it would also be applicable to the Swedish example in (1c). The relevant feature matrix is provided in (6).

## (5) French

- a. *Des bijoux ont été volés.*  
 DE.DEF.PL jewel.PL have.PRS.3PL be.PST.PTCP steal.PST.PTCP.PL  
 ‘Jewels were stolen.’
- b. *De sortir un peu plus te ferait du bien.*  
 DE go out.INF a little more you do.COND.3SG DE.DEF.M.SG good.SG  
 ‘Getting out a bit more would do you good.’

$$(6) \left[ \begin{array}{l} \textit{weak-head} \\ \text{CAT} \left[ \begin{array}{l} \text{HEAD} \quad \boxed{2} \\ \text{MARKING} \quad \textit{de} \\ \text{COMPS} \quad \left\langle \left[ \text{CAT} \quad \boxed{2} \quad \left[ \text{HEAD} \quad \textit{noun} \vee \textit{verb} \right] \right] \right\rangle \\ \text{CONT} \quad \boxed{1} \end{array} \right] \\ \text{CONT} \quad \boxed{1} \end{array} \right]$$

In (6), *de(s)* is no longer of type *prep-word*, but of a separate type *weak-head*. Characteristic of this type is that it shares the value for its HEAD feature with its complement, which means that these features, such as INF on the VP complement in (5b), are visible for external selection. This in turn means that it transmits nominal properties if attached to a noun and verbal properties if attached to a verb. Such prepositions are dubbed “minor” by Van Eynde (2004) and “non-oblique” by Abeillé et al. (2006). This is also the analysis Tseng (2002) proposes for the complementiser *that* in English. The role of weak heads within the overall descriptive apparatus of HPSG is similar to that of non-projecting words in LFG in that they do not project, though as shown in Table 7.3, they differ with respect to semantic content. Both these systems are thus significantly different from Minimalism,

where heads must always project. In diachronic terms, the development is then captured in HPSG from N to “full” P head and thence to either a transparent or a weak head or indeed, as here, to both.

The examples in (1) instantiate a well-known difficulty in synchronic descriptions of prepositions, namely how to model the formal identity beside the functional differences, and accounts such as those set out in (2), (3) and (4) achieve this goal by retaining the syntactic category P while associating it with different sets of morphosyntactic and semantic content. An alternative way to proceed is to postulate a separate category for the grammatical marker, in particular the functional head K, which licenses the associated NP or DP. K in turn can be realised either as a case-inflection or as a preposition. This solution has been strongly advocated in recent work within the nanosyntactic variant of Minimalism – see for example Svenonius (2008) and Roy & Svenonius (2009). Such an approach offers a way to capture the functional equivalence of *till* in an example like (1b) and the dative case in the equivalent in a language like Latin, through the structural difference between the preposition and the case marker is not as straightforwardly captured. In the present context, it is to be noted that this case-marking function of prepositions is itself the outcome of historical change. Items like Swedish *till*, English *to* and French *à* start out as semantically full expressions of direction and acquire this secondary role over time. The same goes for prepositions like English *of* and French *de* in their role as marking the argument of nominal head in expressions like *the king of England* or *le roi de France*. Within Minimalism such shifts can be seen as involving a change from P to K, whereas once again, in HPSG and LFG, the change is in the information associated with the argument of P rather than in the category itself.<sup>6</sup>

## 6 Prepositions in the verbal domain

Prepositional items may also develop in the direction of taking verbal complements. In this section we examine three contrasting circumstances within Germanic and one further one in Romance. The Germanic developments are summarised in (7).

- (7) a. English: *to* develops both as a preposition and as an infinitival marker.  
b. German: *zu* derives from the same etymon as English *to* (< PIE \*do ‘to’, ‘toward’) and also has both prepositional and infinitival functions.

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<sup>6</sup>For some discussion of the use of K in the analysis of complex prepositions like *in spite of*, Danish *på grund af* ‘because’, lit. ‘on ground of’ and French *à côté de* ‘beside’, lit. ‘at side of’, see Roy & Svenonius (2009) and Vincent (in press).

- c. Swedish and Danish: the infinitive marker *att/at* also derives from a PIE locative particle \*ad ‘to’ but in this instance, unlike English and German, there is no homophony between infinitive marker and preposition, either because, as with Swedish *åt*, the preposition has an independent phonetic development or because, as in Danish, the prepositional usage does not survive.

All these developments are instances of the cross-linguistically recurrent diachronic cline (8) identified in Haspelmath (1989).

- (8) allative preposition > purposive marker > infinitival marker

At the same time, there are significant structural differences between the individual Germanic languages under consideration here. German *zu* cannot be separated from the verb and hence the grammaticality difference between (9a) and (9b).

- (9) German
- a. Er hat versprochen, bald zu kommen.  
 he have.PST promise.PST.PTCP soon ZU come.INF  
 ‘He had promised to come soon.’
- b. \* Er hat versprochen, zu bald kommen.

Indeed *zu* can, in certain circumstances, be part of the verb, as in the infinitive *aufzustehen* ‘to stand up’ beside the finite *ich stehe auf* ‘I stand up’. In the words of Haspelmath (1989: 296). “Modern German *zu* is probably a bound prefix although the spelling treats it as a non-bound element” (compare Giusti 1991 for a similar conclusion).

In English, some separability is permitted, as in the Star Trek introduction: *To boldly go where no man has gone before* or in examples like (10), which are frequent despite the prescriptive prohibition of the split infinitive, not least because there is no obvious alternative to placing the adverb between *to* and *understand*.

- (10) To really understand the situation you need to be an experienced politician.

The grammatical category to be assigned to English *to* is more controversial. Pullum (1982) argues that it behaves like an auxiliary, and Koster & May (1982) place it in I on the grounds that it expresses the feature value [–finite] and that finiteness in English is, in general, a property of items that fall under I. As Falk (2001) observes, this conclusion only follows if functional properties and categorial status have to be aligned, as indeed they do in the GB framework adopted by

Koster & May, but Falk is operating within LFG and, having separated function and category, concludes that *to* is in C. We will not seek to resolve the matter here; it suffices for us to note that all are agreed that its status in this construction is no longer prepositional. Moreover, it is clear that the distribution of *to* in earlier stages of the language implies a different status from that which it has in the modern language (van Gelderen 1998). Haspelmath (1989) adduces similar evidence for the separation of *zu* from V in earlier stages of German. Putting this evidence together, therefore, we can postulate a diachronic trajectory from P to an intermediate functional head such as C or I followed by incorporation under V.

When we come to North Germanic, however, things look rather different. Not only is the etymological source of the infinitival marker different but so is its distribution (Platzack 1986; Beukema & den Dikken 1989; Christensen 2007). The examples in (11) show that Swedish *att*, for example, can be separated from the verb even by whole phrases and clauses.

(11) Swedish

- a. Hon njöt av *att* efter många år åter *känna* fast mark  
 she enjoy.PST of ATT after many year again feel.INF solid ground  
 under fötterna.

under foot.PL.DEF

‘She enjoyed feeling solid ground under her feet again after many years.’

- b. *Att* fastän hon bara kunde ha stängt dörren efter  
 ATT although she only could ha.INF close.PST.PTCP door.DEF after  
 sig *stanna* och *lyssna* på vad han hade att säga  
 REFL stay.INF and listen.INF on what he have.PST ATT say.INF  
 visade sig vara ett dåligt beslut.

show.PST REFL be.INF a poor decision

‘To stay and listen to what he had to say, even though she could have simply closed the door behind her, turned out to have been a poor decision.’

It is also the case that, in Swedish, negation and negated objects obligatorily occur between *att* and the verb as in (12).

(12) Swedish

- a. Hon gjorde sitt bästa för (\*inte) *att* inte somna (\*inte).  
 she do.PST REFL.POSS best for ATT not fall asleep.INF

‘She did her best not to fall asleep.’

- b. Känslan av att ingenting kunna göra (\*ingenting)  
 feeling.DEF of ATT nothing be able.INF do.INF  
 skrämmer mig.  
 frighten.PRS me  
 ‘The feeling of not being able to do anything about it frightens me.’

Given this distribution it is natural to see Swedish infinitival *att* and the corresponding forms in other Scandinavian languages as occupying the complementiser position and hence as instantiating a change from P to C. At the same time, it is of interest that these languages also display a separate form, usually spelled the same but pronounced differently, that is, the complementiser for finite clauses as in (13) (examples (13b) and (13c) taken from Nordström & Boye 2016).

- (13) a. Swedish  
 Olle vet att han får komma på festen.  
 Olle know.PRS COMP he is allowed.PRS come.INF on party.DEF  
 ‘Olle knows that he is allowed to come to the party.’
- b. Danish  
 Hun tvivler på at han er der.  
 she doubt.PRS on COMP he be.PRS there  
 ‘She doubts that he is there.’
- c. Faroese  
 Hon fortelur at hann fer at koma i dag.  
 she tell.PRS COMP he go.PRS AT come.INF in day  
 ‘She says that he is going to come today.’

Thus, in (13c) for example, the first occurrence of *at* is a finite complementiser derived from a demonstrative pronoun and cognate with English *that*, while the second occurrence in the future periphrasis *fer at koma* is cognate with Swedish infinitival *att* and has a prepositional source.

What we have seen in this section, then, is how prepositional items, which are traditionally defined as taking nominal complements may also over time come to be associated with verbal complements. We now turn now to consider the consequences of this alternative pattern of development.

## 7 From the nominal to the verbal domain

We have characterised the changes in the previous section in terms of a historical shift from P to C and/or I, and this is indeed what would have to be said within

both Minimalism and LFG. However, the HPSG concept of “weak head” will allow us to generalise across all the developments by simply saying that the original full head status of the prepositions in question weakens over time. Recall that the definition of a weak head is one that contributes only the value for the MARKING feature but yields its HEAD value, that is, its syntactic category, to the item with which it combines. Thus, if it combines with a verb, as with German *zu*, its external distribution is determined by that verb; if it is an independent constituent, as is the claim made in assigning an item the status of I or C, then it will pattern with that larger constituent, be it finite or non-finite as the context requires. We will consider now some evidence from Romance where the items in question do indeed yield their distributional power to the item with which they co-occur but, unlike the Germanic examples we have been considering, they nonetheless retain their own value as prepositions. In other terminology, they are prepositional complementisers (Kayne 1999; Borsley 2001).

Compare the two French examples in (14) as discussed by Abeillé et al. (2006).

(14) French

- a. Il est allé à la gare.  
he be.PRS.3SG go.PST.PTCP to the station  
‘He went to the station.’
- b. Il m’a invité à venir demain.  
he me-have.PRS.3SG invite.PST.PTCP to come.INF tomorrow  
‘He invited me to come tomorrow.’

(14a) is a clear case of the full lexical preposition *à* with the directional meaning ‘to’, akin therefore to Swedish *till* in (1a). (14b), on the other hand, is another instance of an allative preposition coming to introduce an infinitival complement of a higher verb. The difference in the Romance case is that the pattern with *à* (and its cognates in the other languages) exists and develops side by side with another such pattern using the preposition *de* ‘of, from’ as in the examples in (15).

(15) French

- a. Il vient de Paris.  
he come.PRS.3SG DE Paris  
‘He comes from Paris.’
- b. Il a décidé de venir demain.  
he have.PRS.3SG decide.PST.PTCP DE come.INF tomorrow  
‘He has decided to come tomorrow.’



Abeillé et al. represent the lexical prepositions in (14a) and (15a) in much the same way as they would be represented in other frameworks: they are of the type *prep-word* and take an N-headed complement. The difference between frameworks is rather to be seen in the treatment of the grammaticalised use of the preposition to introduce an infinitive. For Abeillé et al., the weak heads *à* and *de* in (14b) and (15b) are heads in the sense that they select a complement, viz. the infinitival VP *venir demain*, and they add a value for the feature MARKING to the phrases they head, but they remain weak in the sense that they inherit the valence list of the complement. This last point is crucial since the matrix verb, on the one hand, determines the form of the complement – *inviter* in (14b) selects an infinitive marked with *à* and *décider* in (15b) one with *de* – and on the other contracts argument relations via control, or in other circumstances raising, with the embedded infinitive.<sup>7</sup>

At first sight it might appear that this is no different from saying that the items in question have become functional heads. However, Abeillé et al. (2006: note 12) are at pains to stress that, in their words, “weak heads differ from functional heads in LFG or GB”. In particular, a weak head is not a new type of category. As they go on to say: “Although a weak head’s category is underspecified in the lexicon, in any given syntactic context, it has a completely ordinary syntactic category (e.g. N or V). It is important to emphasise that when a weak head inherits a value of type verb or noun, it does not actually “become” a verb or a noun (i.e., a lexical object of type *noun-word* or *verb-word*.” Rather, in our present case, it maintains its status as a *prep-word*, which it shares with the full lexical preposition. In other words, the change is not a matter of grammatical category but of the manner in which elements of this kind integrate with the other parts of the sentence.<sup>8</sup>

Within LFG, a framework in which, as we have said, the distinction between category and function is built into the basic architecture via the distinction between f-structure and c-structure, an example like (14a) can be treated in the same

<sup>7</sup>Unlike either LFG or HPSG, or indeed some versions of Minimalism, Kayne (1999: 50) takes the alternative tack of arguing with respect to precisely this kind of Romance data that “prepositional complementisers do not form a constituent with the infinitival IP they are associated with”. For a detailed response to Kayne’s position, see Borsley (2001).

<sup>8</sup>There is one significant respect in which the infinitival markers differ from ordinary prepositions, namely that they do not combine with the preverbal clitics in the same way a preposition combines with the prenominal article. Thus, *à/de les voir* ‘COMP them see.INF’ does not become \**aux/des voir* in the way that underlying *à/de les garçons* obligatorily becomes *aux/des garçons*. Standard accounts explain this by treating the clitic and the article as belonging to the category D and attributing the differential behaviour to a categorial distinction between a P and C/I, whereas Abeillé et al. follow traditional grammar and treat pronouns and articles as distinct categories with the phonological merger only applying to the sequence P + Art. However, as they observe in their footnote 9, decisive evidence one way or the other is hard to come by.

way as our Swedish example (1a). For the infinitival construction, one option is to maintain the prepositional analysis, which entails a c-structure of the form in (16).

(16) [PP [P à ] [VP venir demain] ]

This in turn would imply that diachronically the shift is not in the prepositional head but rather in an expansion of its f-structure to include xCOMP as well as OBL, so that there is a single lexical item with two alternate functional values depending on context. Alternatively, we have an IP with *à* defined as the value for the COMPFORM feature within its associated f-structure. The latter solution comes back to saying that there has been a diachronic shift at the categorial level, viz. P > C, and hence two distinct items.

The empirical evidence here is split. Latin prepositions did not govern infinitives, but there was a construction in which *ad* took a gerund as complement, thus *ad dicendum* ‘towards, for speaking’. The change seems to have involved the loss of the gerund (in this function at least) and its replacement by the infinitive, itself also a verbal noun in origin. While this argues for *ad* and its Romance reflexes having retained the status of prepositions, the fact that there are in the modern languages alternations between prepositional infinitives and finite complements introduced by *que* ‘that’ argues for the shift from P to C. Thus, if the complement of the preposition *avant* ‘before’ is infinitival, it is introduced by *de*, and if it is a finite clause we have *que*, as in (17).

(17) French

- a. Pierre écrira            la lettre avant de partir.  
 Pierre write.FUT.3SG the letter before DE leave.INF  
 ‘Pierre will write the letter before leaving.’
- b. Pierre écrira            la lettre avant que sa soeur ne  
 Pierre write.FUT.3SG the letter before COMP his sister not  
 parte.  
 leave.SBJV.SG  
 ‘Pierre will write the letter before his sister leaves.’

Whichever solution is in the end adopted, there is a further difference between the use of functional heads in LFG and Minimalism that needs to be emphasised. In the remark quoted above, Abeillé et al. refer to “LFG and GB”. While it is true that in the latter, functional heads were for the most part restricted to C, T, I and D, at least one strand of Minimalism, the so-called cartographic approach developed



reinforces the standard conclusion that grammaticalisation has a clear directionality. Lexical items of various categories may become prepositions with a range of functions and they move on from there to become complementisers, thereby shifting from the domain of nominal marking to verbal marking. A natural question to ask therefore is whether such directionality follows from any independent properties of the frameworks we have been exploring. And in the case of both LFG and HPSG the answer is a clear no. There are no internal principles within their architectures which predict the direction of change. This is a notable difference when compared to Minimalism, where, as we noted at the outset, the fact that grammaticalisation changes show a directionality can be argued – and indeed has been argued, not least by Ian Roberts in a number of studies – to follow from the fact that Universal Grammar allows raising but not lowering as a derivational operation. However, even this principle would not account for our observation that prepositions become complementisers but not vice versa since PP and CP are typically different projections rather than one being the extension of the other.

Two other types of diachronic pattern that have been considered from a Minimalist perspective are so-called lateral grammaticalization and downwards grammaticalization. The classic instance of the former is the development of deictic markers into copular verbs (see Börjars & Vincent 2017 for discussion and references), where an item appears to jump across from the nominal to the verbal domain. Downward grammaticalization, by contrast, is to be seen when an item starts its grammatical existence in a higher position and evolves into something which occupies a lower position in the tree. A case in point is the discussion by Munaro (2016) of the development of complementisers in some Italo-Romance dialects, where an item that was originally in the higher Force head position comes to occupy the lower Fin position. The evidence of changes such as these suggests that directionality of derivation is not the key to the directionality of change.

The alternatives, therefore, are either to find other internal mechanisms of grammar, such as the Late Merge and Economy principles proposed by van Gelderen (2009; 2011), or to consider the driving force of change to be the external circumstances of language use, but to deploy the devices of formal syntax in order to model such changes as and when they are attested. Thus, if, over time, we find evidence of nouns evolving into prepositions, prepositions evolving into complementisers and prepositions evolving from lexical (“full semantics”) to grammatical (“weak” semantics), but we do not have any attested cases of the reverse, we may reasonably ask: why not? The answer, we suggest, lies in the fact that non-finite forms start out as nominal and shift to verbal as they are incorporated into the verbal paradigm. There is, by contrast, no corresponding nominalisation of

finite forms. In other words, the directionality follows from the content and contextual function of the constructions at issue and does not need to be ascribed to any principle of UG.

The constructions we have reviewed here also demonstrate that large scale categorial changes can – and given the diachronic evidence should – be broken down into smaller steps which in turn can be modelled using such formal constructs as weak and transparent heads and non-projecting words. Within frameworks like LFG and HPSG, however, such constructs are not required to respect universal principles of categorial hierarchy. And in particular within a parallel correspondence architecture such as that provided by LFG, changes in the different dimensions do not necessarily proceed at the same pace. This, of course, is a familiar result when it comes to (morpho)syntax and phonology, but even within the former dimension we can now see that an item may cease to co-occur with nominals without necessarily losing the marking properties of a preposition. What, on the other hand, all three systems discussed here share is a commitment to the formal modelling of linguistic structure. The relation between any formal account and a functional explanation for the existence or development of that account remains, by contrast, an open question.

## Abbreviations

3	third person	OBJ	object
COMP	complementizer	OBL	oblique
COND	conditional	PL	plural
DEF	definite	POSS	possessive
FUT	future	PRS	present
GB	government-and-binding theory	PST	past
HPSG	Head-Driven Phrase Structure Grammar	PTCP	participle
INF	infinitive	REFL	reflexive
LFG	Lexical-Functional Grammar	SBJV	subjunctive
M	masculine	SG	singular
		UG	Universal Grammar

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## References

- Abeillé, Anne, Oliver Bonami, Danièle Godard & Jesse Tseng. 2006. The syntax of French *à* and *de*: An HPSG analysis. In Patrick Saint-Dizier (ed.), *Computational linguistics dimensions of the syntax and semantics of prepositions*. Dordrecht: Springer.
- Asbury, Anna, Jakub Dotlačil, Berit Gehrke & Rick Nouwen (eds.). 2008. *Syntax and semantics of spatial P*. Amsterdam: John Benjamins. DOI: 10.1075/la.120.
- Baker, Mark C. 2003. *Lexical categories: Verbs, nouns, and adjectives*. Cambridge: Cambridge University Press.
- Beukema, Frits & Marcel den Dikken. 1989. The position of the infinitival marker in the Germanic languages. In Dany Jaspers, Wim Klooster, Yvan Putseys & Pieter Seuren (eds.), *Sentential complementation and the lexicon*, 57–75. Dordrecht: Foris.
- Biberauer, Theresa. 2017. Particles and the final-over-final condition. In Michelle Sheehan, Theresa Biberauer, Ian Roberts & Anders Holmberg (eds.), *The final-over-final condition*, 187–296. Cambridge, MA: MIT Press.
- Börjars, Kersti, Erika Chisarik & John Payne. 1999. On the justification for functional categories in LFG. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG99 Conference*. Stanford, CA: CSLI Publications.
- Börjars, Kersti, Pauline Harries & Nigel Vincent. 2016. Growing syntax: The development of a DP in Northern Germanic. *Language* 91(1). e1–e37. DOI: 10.1353/lan.2016.0002.
- Börjars, Kersti & Nigel Vincent. 2011. Grammaticalization and directionality. In Heiko Narrog & Bernd Heine (eds.), *The Oxford handbook of grammaticalization*, 163–176. Oxford: Oxford University Press.
- Börjars, Kersti & Nigel Vincent. 2017. Lexical-Functional Grammar. In Adam Ledgeway & Ian Roberts (eds.), *The Cambridge handbook of historical syntax*, 642–663. Cambridge: Cambridge University Press.
- Börjars, Kersti & Nigel Vincent. 2019. Modelling step change: The history of will-verbs in Germanic. In Nuria Yáñez-Bouza, Willem Hollmann, Emma Moore & Linda van Bergen (eds.), *Categories, constructions and change in English syntax*. Cambridge: Cambridge University Press.
- Borsley, Robert D. 1986. Prepositional complementizers in Welsh. *Journal of Linguistics* 22(1). 67–84. DOI: 10.1017/S0022226700010562.
- Borsley, Robert D. 2001. What do ‘prepositional complementizers’ do? *Probus* 13(2). 155–171. DOI: 10.1515/prbs.2001.001.
- Butt, Miriam & Tracy Holloway King (eds.). 2001. *Time over matter: Diachronic perspectives on morphosyntax*. Stanford, CA: CSLI Publications.

- Campbell, Lyle. 2001. What's wrong with grammaticalization? *Language Sciences* 23(2–3). 113–161. DOI: 10.1016/S0388-0001(00)00019-X.
- Christensen, Ken Ramshøj. 2007. The infinitive marker across Scandinavian. *Nordlyd* 34. 145–163.
- Cinque, Guglielmo & Luigi Rizzi (eds.). 2010. *Mapping spatial PPs*. Oxford: Oxford University Press.
- Evans, Nicholas & Stephen C. Levinson. 2009. The myth of language universals. *Behavioral and Brain Sciences* 32(5). 429–492. DOI: 10.1017/S0140525X0999094X.
- Falk, Yehuda. 2001. Infinitival *to*. Ms., The Hebrew University of Jerusalem. <http://pluto.mscc.huji.ac.il/~msyfalk/Infinitival.pdf> (25 June, 2020).
- Flickinger, Dan. 2008. Transparent heads. In Stefan Müller (ed.), *Proceedings of the 15th International Conference on Head-Driven Phrase Structure Grammar*, 87–94. <http://csli-publications.stanford.edu/HPSG/2008/flickinger.pdf>.
- François, Jacques, Éric Gilbert, Claude Guimier & Maxi Krause (eds.). 2009. *A-tour de la préposition*. Caen: Presses Universitaires de Caen.
- Froud, Karen. 2001. Prepositions and the lexical/functional divide: Aphasic evidence. *Lingua* 111(1). 1–28. DOI: 10.1016/S0024-3841(00)00026-7.
- Giusti, Giuliana. 1991. *Zu*-infinitivals and sentential structure in German. *Rivista di Linguistica* 3. 211–234.
- Haspelmath, Martin. 1989. From purposive to infinitive – a universal path of grammaticization. *Folia Linguistica Historica* X(1–2). 287–310. DOI: 10.1515/flih.1989.10.1-2.287.
- Heine, Bernd, Ulrike Claudi & Friederike Hünemeyer. 1991. *Grammaticalization: A conceptual framework*. Chicago: Chicago University Press.
- Heine, Bernd & Tania Kuteva. 2002. *World lexicon of grammaticalization*. Cambridge: Cambridge University Press.
- Joseph, Brian D. 2001. Is there such a thing as “grammaticalization”? *Language Sciences* 23(2–3). 163–186. DOI: 10.1016/S0388-0001(00)00020-6.
- Kayne, Richard S. 1999. Prepositional complementizers as attractors. *Probus* 11(1). 39–73. DOI: 10.1515/prbs.1999.11.1.39.
- Kehayov, Petar & Kasper Boye. 2016. Complementizer semantics in European languages: Overview and generalizations. In Kasper Boye & Petar Kehayov (eds.), *Complementizer semantics in European languages*, 809–878. Berlin: De Gruyter.
- Koster, Jan & Robert May. 1982. On the constituency of infinitives. *Language* 58(1). 116–143. DOI: 10.2307/413533.
- Kroeger, Paul. 1993. *Phrase structure and grammatical relations in Tagalog*. Stanford, CA: CSLI Publications.

- Kuryłowicz, Jerzy. 1965. The evolution of grammatical categories. *Diogenes* 13(51). 55–71. DOI: 10.1177/039219216501305105.
- Lightfoot, David W. 1979. *Principles of diachronic syntax*. Cambridge: Cambridge University Press.
- Meillet, Antoine. 1912. L'évolution des formes grammaticales. In Antoine Meillet (ed.), *Linguistique historique et linguistique générale*, 131–148. Paris: Champion.
- Munaro, Nicola. 2016. A diachronic approach to complementizer doubling in Italo-Romance and the notion of downward reanalysis. *Rivista di Grammatica Generativa* 38. 215–228.
- Munaro, Nicola & Cecilia Poletto. 2014. Synchronic and diachronic clues on the internal structure of 'where' in Italo-Romance. In Paola Benincà, Adam Ledgeway & Nigel Vincent (eds.), *Diachrony and dialects: grammatical change in the dialects of Italy*, 279–300. Oxford: Oxford University Press.
- Newmeyer, Frederick J. 2001. Deconstructing grammaticalization. *Language Sciences* 23(2–3). 187–229. DOI: 10.1016/S0388-0001(00)00021-8.
- Nordström, Jackie & Kasper Boye. 2016. Complementizer semantics in the Germanic languages. In Kasper Boye & Petar Kehayov (eds.), *Complementizer semantics in European languages*, 131–174. Berlin: De Gruyter.
- Plank, Frans. 2015. Time for change. In Carlotta Viti (ed.), *Perspectives on historical syntax*, 61–91. Amsterdam: John Benjamins. DOI: 10.1075/slcs.169.03pla.
- Platzack, Christer. 1986. COMP, INFL, and Germanic word order. In Lars Hellan & Kirsti Koch Christensen (eds.), *Topics in Scandinavian syntax*, 185–234. Dordrecht: Reidel.
- Pollard, Carl & Ivan A. Sag. 1994. *Head-driven Phrase Structure Grammar*. Stanford, CA: CSLI Publications.
- Pullum, Geoffrey K. 1982. Syncategorematicity and English infinitival *to*. *Glossa* 16. 181–215.
- Rizzi, Luigi. 1997. The fine structure of the left periphery. In Liliane Haegeman (ed.), *Elements of grammar*, 281–337. Dordrecht: Kluwer.
- Roberts, Ian. 2010. Grammaticalisation, the clausal hierarchy, and semantic bleaching. In Elizabeth Closs Traugott & Graeme Trousdale (eds.), *Gradience, gradualness and grammaticalization*, 45–73. Amsterdam: John Benjamins. DOI: 10.1075/tsl.90.05rob.
- Roberts, Ian & Anna Roussou. 2003. *Syntactic change: A minimalist approach to grammaticalization*. Cambridge: Cambridge University Press.
- Roy, Isabelle & Peter Svenonius. 2009. Complex prepositions. In Jacques François, Éric Gilbert, Claude Guimier & Maxi Krause (eds.), *Autour de la préposition*, 105–116. Caen: Presses Universitaires de Caen.



- Saint-Dizier, Patrick (ed.). 2006. *Dimensions of the syntax and semantics of prepositions*. Dordrecht: Springer.
- Svenonius, Peter. 2008. Projection of P. In Anna Asbury, Jakub Dotlačil, Berit Gehrke & Rick Nouwen (eds.), *Syntax and semantics of spatial P*, 63–84. Amsterdam: John Benjamins. DOI: 10.1075/la.120.04sve.
- Toivonen, Ida. 2003. *Non-projecting words: A case study of Swedish particles*. Dordrecht: Kluwer.
- Traugott, Elizabeth Closs & Graeme Trousdale. 2013. *Constructionalization and constructional changes*. Oxford: Oxford University Press.
- Tseng, Jesse. 2000. *The representation and selection of prepositions*. University of Edinburgh. (Doctoral dissertation).
- Tseng, Jesse. 2002. Remarks on marking. In Frank Van Eynde, Lars Hellan & Dorothee Beermann (eds.), *Proceedings of the 8th International Conference on HPSG*, 267–283. Stanford, CA: CSLI Publications. <http://csli-publications.stanford.edu/HPSG/2/tseng-pn.pdf>.
- Van Eynde, Frank. 2004. Minor adpositions in Dutch. *The Journal of Comparative Germanic Linguistics* 7(1). 1–58. DOI: 10.1023/B:JCOM.0000003545.77976.64.
- van Gelderen, Elly. 1998. The future of *for to*. *Journal of Germanic Linguistics & Literatures* 10(1). 45–72. DOI: 10.1017/S1040820700002225.
- van Gelderen, Elly. 2009. Renewal in the left periphery: Economy and the complementiser layer. *Transactions of the Philological Society* 107(2). 131–195. DOI: 10.1111/j.1467-968X.2009.01216.x.
- van Gelderen, Elly. 2011. *The linguistic cycle: Language change and the language faculty*. Oxford: Oxford University Press.
- Vincent, Nigel. 1999. The evolution of c-structure: Prepositions and PPs from Indo-European to Romance. *Linguistics* 37(6). 1111–1153. DOI: 10.1515/ling.37.6.1111.
- Vincent, Nigel. 2017. Parts and particles: The story of DÉ. In Bettelou Los & Pieter de Haan (eds.), *Word order change in acquisition and language contact*, 291–310. Amsterdam: John Benjamins. DOI: 10.1075/la.243.13vin.
- Vincent, Nigel. 2018. Definiteness in diachrony: Romance vs Germanic. Paper delivered at the workshop on “Specificity, definiteness and article systems across languages” at DGfS 40. University of Stuttgart.
- Vincent, Nigel. In press. Complex versus compound prepositions: Evidence from Gallo-Romance. In Sam Wolfe & Martin Maiden (eds.), *Variation and change in Gallo-Romance grammar*. Oxford: Oxford University Press.
- Wiltschko, Martina. 2014. *The universal structure of categories: Towards a formal typology*. Cambridge: Cambridge University Press.