

# Adpositions and Lexical Categories Distributed Morphology's Insight into the Problem

ROBERT JOEL DEACON

*University of Florida*

rdeacon.joel@gmail.com

**Abstract:** The lexical/functional status of adpositions is unclear both traditionally and within the framework of Distributed Morphology (DM). Adpositions present a categorial problem for DM because they are traditionally understood to have both lexical and functional properties and because the vocabulary insertion mechanism of DM requires a strict division between lexical and functional items. However, a more discrete analysis of adpositional items shows that these items can be divided into lexical and functional items. The lexical distribution of certain adpositional items can be accounted for in DM by analyzing these forms as Root lexical items categorized by a little *p\_* head. Therefore, like nouns, verbs and adjectives, many adpositions consist of bare Roots selected by a category-defining head. Adpositional forms that do not have a lexical distribution are argued to be the representation of a little *p\_* head that has selected for a DP. These adpositional forms, like auxiliaries for verbs and pronouns for nouns, are viewed as functional insertions within a domain capable of framing lexical nodes. This more discrete analysis thus helps explain why traditional classification problems exist and provides a solution for this problem.

## 1. Introduction: Lexical Categories and Adpositions

Adpositions (prepositions, postpositions, circumpositions, and ambipositions) do not behave on the surface as traditional lexical or functional items. Accordingly, they have been treated in a variety of ways: as functional items, as lexical items, as split items and or as semi-lexical items.

Many linguists from different approaches have treated adpositional elements as functional items. Some of these argue that adpositions are universally functional (Baker 2003; DeLancey 2005). Baker (2003) argues that the adpositional class is functional because it is a closed class, adpositional items do not incorporate, and adpositional items do not partake in derivational morphology. Croft also concludes that adpositions do “not merit the status of a major syntactic category in the way that ‘noun,’ ‘verb,’ and (to a lesser extent) ‘adjective’ do” because for one there are languages with no adpositions (1991:144).

Like Baker (2003) and Croft (1991), Grimshaw's (1991, 2005) system treats adpositions as a functional class. In Grimshaw's feature-based system, prepositions are viewed as functional categories in the nominal extended projection. In this system, functional categories have a positive functional feature *F* (i.e. *F*<sub>1</sub>, *F*<sub>2</sub>, *F*<sub>3</sub> ... corresponding to their place in the extended projection) whereas lexical categories (*N* and *V*) have an unvaluable ([*F*<sub>0</sub>) functional feature.

In contrast to the positions above, some of the earliest generative work on categories, treat prepositions as a syntactic category defined by negative nominal and verbal features [-*N*,

-V] (Chomsky 1970, 1981) or a negative subject and positive object feature [-S,+O] (Jackendoff 1973, 1977). The binary [+/-N, +/-V] or [+/-S, +/-O] feature matrix is thus proposed to be responsible for producing the four major lexical/syntactic categories N, V, A, and P. In this way the category P is firmly grouped with the other lexical categories.

More recent proposals have also treated adpositions as lexical items. Koopman (2000) clearly groups prepositions with the other traditional lexical categories. Furthermore, in Koopman's (2000) work and other's (Botwinik-Rotem 2004; den Dikken 2006; Svenonius 2007, 2008) prepositions have been taken to project their own functional structure (a light *p*) in parallel with the VP's light *v*. Such proposals align the category P with other major syntactic categories as Chomsky and Jackendoff originally proposed. Likewise, Muysken (2008), who finds fault with the arguments of Baker (2003), argues that it is better to universally view adpositions as not being a functional class because of the lexical behavior of adpositions in certain languages (i.e. they show a lexical like distribution and serve as the input for further morphological processes), because of particle verb incorporation as discussed in den Dikken (1995) and because adpositions do not "provide the structural skeleton for the main constituents of the sentence" as other clearly functional elements do (Muysken 2008: 240).

In addition to the debate of whether the class is universally lexical or functional or if the class is either lexical or functional at the language specific level, others have noted that the classification of adpositions is problematic at the language specific level. Hudson for one calls prepositions "the clearest example of a split word class", specifying that "some prepositions are content words and some are FWs [function words]" within the same language (2000: 17). Adpositions are argued to be both functional and lexical in Dutch (Zwarts 1995, 1997) and English (Deacon 2011, Deacon 2014). Given this, one could interestingly say that the larger universal classification problem mirrors the split behavior seen at the language specific level (i.e. at least in some languages).

Given the mixed results from the traditional methodology for distinguishing lexical and functional material, it is not surprising that in addition to being labeled a split class, adpositions are also described in some languages as members of a semi-lexical class<sup>1</sup> (Zeller 2001; Cover and Riemsdijk 2001; Mardale 2011). A semi-lexical class is not the same as a split class. A split word class indicates that some members are truly functional while others are truly lexical. A semi-lexical class can be defined as a group of items that occupy both functional and lexical domains. This description is problematic, however, because there is no consistent definition of semi-lexicality in the literature (cf. Deacon 2014).

As it should be clear, the category adposition is a problem that gets treated rather differently in different works and within different frameworks. To summarize, if adpositions form a lexical category, the category is probably not universal (Croft 1991; Baker 2003; DeLancey 2005). On the other hand, if adpositions are functional then they represent a rather different type of functional item (Muysken 2008). If adpositions are a split word class then they are probably not really a word class and if they are semi-lexical, it is unclear what that would mean. Major

---

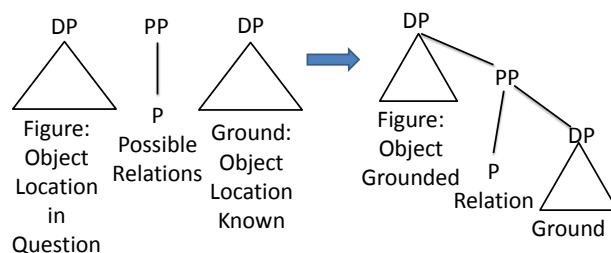
<sup>1</sup> It is unclear if the semi-lexical status is intended for all adpositional like forms.

questions therefore remain regarding the natural class status of adpositions, their lexical/grammatical status, and their status as universal or potentially universal items.

## 2. Unifying Adpositions

While the category adposition is troublesome for lexical/functional classification, the common identifying semantic function of transitive adpositions can be captured as follows: adpositions are items that relate/connect two entities or two constituents (Zeller 2001). In English Svenonius (2007, 2008) describes spatial prepositions as morphemes that relate a Figure to a Ground. The Figure or DP Figure is “an object whose location is at issue” while the DP Ground is “the reference landmark for the location of the Figure” (2007:1). In Langacker (1987) the DP Ground is referred to as the landmark. In other words, the prepositional element gives the location of the Figure DP in relation to the Ground DP. This is demonstrated with Figure (1).

Figure 1: Semantic function of transitive adpositions.



As Figure (1) shows, the category P relates or links an unknown position with a known one. The meaning of the adpositional form itself merely specifies how P links or relates two entities. This ability is described by proposing two features for P: [F-LINK] (Figure Link) and [G-LINK] (Ground Link). These features are thus proposed to be responsible for creating an adposition in the syntax.

Following this, the consistent defining feature of particles in contrast to prepositions is that they are objectless. Emonds (1972, 1976) calls particles intransitive prepositions while den Dikken defines them as “the class of non-Case-assigning, argument taking prepositional elements” (1995:33). Both definitions, one semantic and one structural, capture the fact that particle forms are not object taking or object licensing items.

Sticking with the semantic description and building upon Emond’s definition, instead of a [+/- CASE] distinction, the fact the particle forms lack an object can be further described as the difference between DP Figure and DP Ground selection. Prepositions select a Ground (which may be omitted in certain circumstances) and a DP Figure while particles only select a DP Figure (cf. Svenonius 2007).

Given this, the unifying semantic-syntactic function of adpositions is to relate something unknown (DP Figure) to something known (DP Ground). In most cases where the adpositional element is claimed to be intransitive, the DP Ground is somehow understood or incorporated into the meaning of the adposition itself (see Deacon (2014) for more on this). Accordingly particle

forms are forms with similar meanings that only link to a DP figure. Thus adpositions and particle forms can be united by proposing that they share the proposed [F-LINK] feature.

### **3. Distributed Morphology and Adpositions**

Distributed Morphology, DM, (Halle and Marantz 1993, 1994) is a generative model where all word derivation occurs within the syntax. Its main claim is that there is only one generative component in the grammar: the syntax. In this way the system is more elegant, containing fewer assumptions because the syntax is the only mechanism for building structure. Subsequently the ungenerative parts of the lexicon are split into 3 lists: List A, B and C. The function of these lists is to provide the syntax with grammatical features (List A), phonological features (List B), and interpretations (List C).

List A contains Root items and all the morpho-syntactic (abstract morphemes) features that a language has selected from all the available features provided by Universal Grammar (Marantz 1997; Harley and Noyer 1999; Embick and Noyer 2005). Root items are often referred to as l-morphemes (lexical morphemes) while abstract morphemes are often called f-morphemes (functional morphemes) (Harley and Noyer 2000). These Root items must be categorized by a categorial head (typically v\_, n\_ and a\_) in order to receive a grammatical frame in the syntax (Embick and Noyer 2005). Moreover, List A traditionally does not supply either l- or f-morphemes with any phonological features. They are not phonologically realized until the derivation reaches List B.

List B supplies the terminal nodes of the derived syntactic structure with phonological information right before pronunciation at PF. List B accomplishes this by being composed of a list of Vocabulary Insertion Rules that consist of correspondences between sets of features and phonological strings. These phonological strings are called Vocabulary Items, VIs (FVIs for functional nodes and LVIs for lexical nodes). Associated Features are the features an FVI is sensitive to regarding insertion into a syntactic terminal node.

The principle governing the insertion of VIs into terminal nodes is known as the Subset Principle. The Subset Principle states that a VI can be inserted if it meets all or a subset of the features of a terminal node during Vocabulary Insertion, thus allowing VIs to be underspecified with regard to the features in the targeted terminal node. A VI cannot have more or different Associated Features than the terminal node it is being matched with. In other words, a VI can be associated with fewer but not more features than a terminal node has to offer. This means that VIs with Associated features cannot appear in Root-nodes, a problem for adpositional forms.

### **4. Adpositions in Lexical Positions**

In addition to their adpositional use, finding adpositional forms in other lexical positions is common in English and Mandarin. This section gives some evidence to support this claim and to show the necessity for the proposal that certain adpositional forms originate as Root-nodes. The discussion begins with some adpositional forms found in verbal (1) and nominal domains (2).

*Adpositions and Lexical Categories*

- (1) Verbal Domain (Transitive)
- |    |   |                      |
|----|---|----------------------|
| a. | John <i>downed</i> the drink.                     | ‘went down’          |
| b. | The farmer <i>inned</i> the hay                   | ‘went inside’        |
| c. | The runner <i>neared</i> the finish point         | ‘closely approaches’ |
| d. | The mafia <i>offed</i> the FBI informant.         | ‘killed/murdered’    |
| e. | The newspaper <i>outed</i> them for lip synching. | ‘exposed’            |
- (2) Nominal Domain (Count nouns)
- |    |   |                       |
|----|---|-----------------------|
| a. | The team has two <i>downs</i> remaining   | ‘possessions’         |
| b. | I have an <i>in</i> with the boss.        | ‘a connection’        |
| c. | This hatch is my only <i>out</i> .        | ‘way of escape’       |
| d. | Rahul Dravid scored on that <i>over</i> . | ‘cricket bowling set’ |

In addition to these examples from English, several Mandarin Chinese prepositional forms can be used a verbs. Two examples are provided here: *cóng* ‘from’ and *gěi* ‘with’. Compare the use of (3) and (4) and (5) and (6).

- (3) cōng Měiguó dào Zhōngguó hěn yuǎn  
From America to China very far  
*‘From America to China is very far’*
- (4) nǐ jiù cōng le wǒ bā  
you right from ASP me PART  
*‘You are from me.’*
- (5) wǒ gěi wǒ de péngyǒu xiě xìn  
I to me LINK friend write letter.  
*‘I to my friend wrote a letter’*
- (6) wǒ gěi le tā yī běn shū  
I give ASP him 1 CL book  
*‘I gave him a book.’*

In addition to prepositional forms found in verbal domains, Chinese postpositional items are often found in other lexical domains. For instance (*qián* ‘in front’,) is seen in a postpositional (7) and nominal domain (8) and (*xià* ‘below’) is seen in a postpositional (9) and verbal domain (10).

- (7) tā zài shūdiàn qián mǎi shū  
he LOC bookstore front buy book  
*‘He bought/buys a book in front of the bookstore.’*

- (8)           qián    yǒu   mái-fú  
front    exist   bury-ambush  
‘there is an ambush in the front’
- (9)           tā    zài   shūdiàn   xià    mǎi   shū  
he    LOC   bookstore   below   buy   book  
‘He bought/buys a book below the bookstore.’
- (10)          wǒ   xià    shān    le  
I     down   mountain   ASP  
‘I went down the mountain’

It should be clear from the data that adpositional forms are used in other lexical domains. Moreover, these identical phonological forms operating in different domains arguably share a similar meaning, further suggesting that each attestation comes from a common source.

Adpositions are commonly associated with case features. Moreover, it was proposed that all *P-items* (particles and prepositions) can be unified by being associated with an [F-LINK] feature. Translated into DM, these claims suggest that the Category P is a functional category, composed of f-morphemes, (defined by [F-LINK]. Accordingly, whatever item realizes this feature and other adpositional features must be labeled an FVI as would be the case for the VI *down* in (11).

- (11)           The kids slid [p[F-LINK, G-LINK, CASE, DIR ...]--down] the slide.

In order for *down* to be inserted in the environment seen with (11), it needs to be associated with some feature that allows it to win over other FVIs (the identity of this feature does not matter for this argument). In addition to the prepositional use in (11), examples such as (1a) and (2a) suggest that *down* is an LVI, corresponding with  $\sqrt{\text{Root}}$ -nodes (l-morphemes) categorized by *little*  $v_-$  (1a) and  $n_-$  (2a). Accordingly, whichever feature allows *down* to win in (11) would necessitate that it would lose in (1a and 2a) because the Subset Principle forbids inserting a VI into a terminal node if the VI has more feature(s) than the terminal node. Root-nodes have no morph-syntactic features.

Thus if the origin of *down* is the same in (1a,2a) and (11), there is a categorical problem for adpositions in DM (as in traditional accounts) because forms like *down* are neither exclusively functional nor lexical and the Subset Principle prevents insertion of the same Vocabulary Item into both functional and lexical domains.<sup>2</sup> A more discrete analysis, however, shows that adpositions can be treated like the other major lexical categories in DM, solving the theory internal insertion problem and avoiding the inconsistency of the semi-lexical label for adpositions in DM.

---

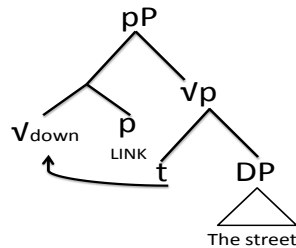
<sup>2</sup> See Deacon (2011, 2014), De Belder (2011), and De Belder and Craenenbroeck (2013) for a more technical discussion of how and why this may be a problem in DM.

**4.1. Adpositions Involving a Root-node**

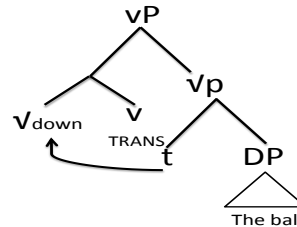
As mentioned, DM proposes that  $\sqrt{\text{Roots}}$  must be categorized by verbal, nominal or adjectival type features: [+v], [+n], or [+a] (Marantz 2001). These categorizing heads are merely labels whose value resides in identifying categorial feature classes. In order to explain adpositional forms appearing in other lexical domains as seen in the previous section, it is argued here, as in Deacon (2011, 2014), that these forms are LVIs inserted into a Root-node.

Prepositional forms with lexical uses are proposed to be LVIs inserted into a  $\sqrt{\text{Root-node}}$ . When these forms occur in a prepositional domain, they involve a  $\sqrt{\text{Root}}$  node categorized by a *little p\_* head, a label for categorial adpositional features. This head represents relational features where a relational feature links a DP Figure to a DP Ground (a prepositional context) or just to a DP Figure (a particle context). Categorization by *little p\_* is argued to be the same as categorization by any other categorial head in DM. These LVIs, therefore, in principle, may be inserted in a node governed by any categorizing head: *a\_*, *n\_*, or *v\_* as well as the proposed fourth categorizing head, *p\_*. Thus the uses of *down* in *We walked down the street* and *John downed the ball* are analyzed as in (12).

(12a)



(12b)



In (12a), the root  $\sqrt{\text{DOWN}}$  is categorized by a *p\_* head containing the [F-LINK, G-LINK] features. In (12b), it is categorized by a *little v\_* head containing at least a [TRANSITIVE] feature. This explains in part the lexical distribution of many adpositional items. The same analysis can be used to explain the verbal use of adpositions in Mandarin.

**5. Evidence for p\_**

Not every categorial head is represented by phonological material in all environments across the world's languages. Often a null categorizing morpheme is argued to be present in what are traditionally called zero conversions. Nevertheless, one piece of evidence for the existence of categorial heads is seen with affixes that determine 'word' category.<sup>3</sup>

In English, there exists affixes that can be attributed to the three main lexical categories: the suffixes /-tion/ or /-ness/ are understood to be the manifestation of *n\_* heads, /-ify/ or /-ize/ *v\_* heads and /-ive/, /-ous/ *a\_* heads. This would leave *little p\_* as the odd head out as it so far has only been represented by /Ø/. If one, however, analyzes forms such *around* and *below* as consist-

---

<sup>3</sup> The fact that no phonological evidence is found in Chinese for *p\_* should not be surprising as Mandarin largely lacks overt prefixes and suffixes.

ing of two morphemes /a-/ + √ROUND and /be-/ + √LOW, there is phonological evidence for the proposed little  $p_-$  head in English (Tables 1-2) and Dutch (Table 3).

Table 1: Roots prefixed with /a-/

√Root Item	a-headed prepositions	√Root Item	a-headed particles/results
cross→	across	side →	aside
long →	along	stray →	astray
round→	around	ground→	aground
top→	atop	part→	apart
board→	aboard	ghast→	aghost
mid(st)→	amid/amidst	way →	away
side→	aside	shore →	ashore
fore→	afore	sleep →	asleep
mong(st)→	amongst	new→	anew
		loft	aloft
		foot→	afoot

As seen with Table (1), the addition of /a-/ systematically changes the function/frame of the base Root item, turning them into either prepositions, particles or a type of result. A systematic change is also seen with /be-/, Table (2).

Table 2: Roots prefixed with /be-/

√Root item	be-headed prepositions	be-headed particles/results
fore →	before	GAP
hind→	behind	GAP
low→	below	GAP
yond→	beyond	GAP
side→	beside	GAP
neath →	beneath	GAP
two→	between	GAP
mong(st)	bemongst	GAP

Table (2) shows that the addition of /be-/ systematically changes the function/frame of the base Root item (sometimes overlapping with /a-/ as in *side*, *fore*). Moreover, interestingly Roots prefixed with /be-/ cannot operate as particles (as defined by inversion and fronting tests, cf. Deacon 2014) or results. This can only be explained if we treat these items as bi-morphemic items where the features represented by /a-/ and /be-/ are different, crucially /be-/ is associated with a [G-LINK] feature. Further evidence for  $p_-$  is found with Dutch forms being tuned into prepositions, Table (3).



## *Adpositions and Lexical Categories*

Table 3: Dutch preposition conversions

Form + /-en/ suffix	Use	Meanings	Form + /b(e)-/ prefix	use	Meaning
uiten	verb	'to draw out'	buiten	preposition	outside
innen	verb	'to take in'	binnen	preposition	Inside/until/on
halveren	verb	To halve	behalve	preposition	'beside/alongside
houden	verb	To hold	behoudens	preposition	'barring'
treffen	Noun/verb	a battle/ to meet	betreffen	preposition	'concerning'
noorden	noun	North	benoorden	preposition	'above' 'north of'
zuiden	noun	South	bezuiden	preposition	'south of'

It is seen that the forms in Table (3), which are not used as prepositions, exclusively become propositions when attached with /b(e)-/, meaning that /b(e)-/ represents features that turn some lexical items into prepositions.

### 5.1. Functional Ps

It is believed that there is a functional member or set of functional members for most if not all domains that define lexical categories (Schütze 2001). According to Emonds "there exist significant closed classes of grammatical formatives that are simply *subclasses* of the head-of-phrase categories N, V, A, and P" (1985; 162). These would include things such as auxiliaries for verbs and pronominals for nouns. The identity, however, of the grammatical subclasses for A and P is often less clear (the item *so* for *a\_* (cf. Schütze 2001)). It thus argued that the forms in Table (4) are the functional closed class for p\_ in English and Mandarin.

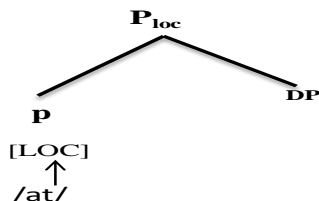
Table 4: FVI forms in English and Mandarin<sup>4</sup>

English			Mandarin FVIs		
FVIs	Assoc. Feat. in addition to [F-LINK, G-LINK]		FVIs	Assoc. Feat. in addition to [F-LINK, G-LINK]	
at	↔	[location]	bèi	↔	[agent]
by	↔	[agent]	zì	↔	[source]
from	↔	[source]	wàng	↔	[direction, goal]
to	↔	[goal]	xiàng	↔	[direction]
with	↔	[comitative]	lí	↔	[distal, duration]
via	↔	[path]	de	↔	[genitive]
until	↔	[temporal, goal]	yú	↔	[underspecified]
of	↔	[genitive]			
for	↔	[duration]			
for	↔	[goal, volition]			

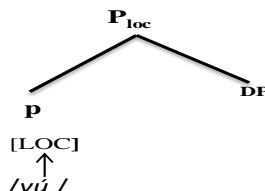
<sup>4</sup> The exact value of their Associated Features is not argued here as some of these features might need to be related to explain insertions into different functional nodes.

The forms given in Table (4) have not been found in any lexical positions. They are argued to be FVIs, representing morpho-syntactic features in the syntax (i.e. a direct representation of  $p_-$  when it selects for a DP rather than a Root phrase (13).

(13a)



(13b)



The structure in (13) demonstrates insertion of FVI directly into the  $p_-$  head. This is when the  $p_-$  does not immediately c-command a Root item.

## 6. Conclusion

As discussed, the classification of adpositions along the lexical/functional spectrum has traditionally been difficult. An analysis attempting to solve a DM theory internal insertion problem reveals that adpositions should be split into lexical members and functional members. Given the lexical distribution of adpositional forms in English and Chinese, proposing that a *little*  $p_-$  head (unified by the presence of an [F-LINK] feature) categorizes  $\sqrt{\text{Root}}$ -nodes in adpositional domains appears justifiable. The morphemes  $/a-/$  and  $/be-/$  were argued to be FVI representation of  $p_-$  in complex adpositional forms such as *aside* and *beside*. It was shown that such an analysis accounts for the fact that these prefixes systematically change Root items into prepositions, particles, or results. It also accounted for the fact that *be*-headed forms cannot operate as particles. Additionally, prepositions can be created from other categories in Dutch with the prefix  $/b(e)-/$ .

This proposal means that the category  $P$  is similar to the other lexical classes as each has a closed set of functional items. It was also proposed that  $p_-$  has a set of functional forms (i.e. of, at, to, etc.) just as  $v_-$  (auxiliaries) and  $n_-$  (pronominals) and perhaps  $a_-$  do. As for being a split class, from this perspective  $p_-$  is no more split than  $n_-v_-$  and  $a_-$  as these can be thought to be labels for a range of similar features that categorize lexical Root items.

This proposal also accounts for why many traditional descriptions have labeled adpositions functional (focusing on the functional features and the functional forms that directly represent  $p_-$ ) and lexical (focusing on the rich semantic meaning that is contributed by Root-items being categorized by  $p_-$ ). The lexical distribution of forms that also appear in adpositional domains is then explained by the same  $\sqrt{\text{Root}}$  item (i.e. the same LVI in a  $\sqrt{\text{Root}}$  node) categorized by a type of  $n_-$ ,  $v_-$  or  $a_-$ . The functional adpositional forms are then FVIs inserted directly under the proposed little  $p_-$  head, explaining why they do not have a lexical distribution. Accordingly there does not need to be a claim that these items are semi-lexical.

## *Adpositions and Lexical Categories*

### References

- Baker, Mark C. 2003. *Lexical Categories: Verbs, Nouns and Adjectives*. Cambridge: Cambridge University Press.
- Botwinik-Rotem, Irena. 2004. The Category P. Features, Projections, Interpretation. PhD dissertation, University of Tel-Aviv.
- Chomsky, Noam. 1970. Remarks on Nominalization. In Jacobs, Roderick, and Peter Rosenbaum (eds.), *Readings in English Transformational Grammar*. Waltham, Ma.: Ginn, 184–221.
- Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris.
- Corver, Norbert, and Henk van Riemsdijk. (eds.). 2001. *Semi-Lexical Categories: The Function of Content Words and the Content of Function Words*. Berlin: Walter de Gruyter.
- Croft, William. 1991. *Syntactic Categories and Grammatical Relations*. Chicago: The University of Chicago Press.
- Deacon, Robert J. 2011. P-forms in Distributed Morphology: accounting for a type of semilexical form. MA Thesis, University of Florida.
- Deacon, Robert J. 2014. Adpositions in Distributed Morphology: The Nature of Roots and Categorical Heads. PhD dissertation, University of Florida.
- De Belder, Marijke. 2011.  $\sqrt{\text{Roots and Affixes: Eliminating Lexical Categories from Syntax}}$ . *LOT 282*.
- De Belder, Marijke, and Jeroen van Craenenbroeck. 2013. *On Vocabulary Insertion*. Ms., HUBrussel.
- DeLancey, Scott. 2005. Adpositions as a Non-Universal Category. In Frajzyngier, Zygmunt, Adam Hodges, and David S. Rood (eds.), *Linguistic Diversity and Language Theories*. Amsterdam: John Benjamins, 185–202.
- den Dikken, Marcel. 1995. *Particles: On the Syntax of Verb-Particle, Triadic and Causative Constructions*. New York, NY.: Oxford University Press.
- den Dikken, Marcel. 2006. On the functional structure of locative and directional PPs. Ms. CUNY.
- Embick, David and Rolf Noyer. 2005. Distributed Morphology and the Syntax-Morphology Interface. In Ramchand, Gillian, and Charles Reiss (eds.), *The Oxford Handbook of Linguistic Interfaces*. Oxford: Oxford University Press, 1–28.
- Grimshaw, Jane. 1991. Extended Projection. Ms., Brandeis University.
- Grimshaw, Jane. 2005. *Words and Structure*. Stanford, Ca.: Center for the Study of Language and Information.
- Halle, Morris, and Alec Marantz. 1993. Distributed Morphology and the Pieces of Inflection. In Hale, Kenneth, and Samuel Jay Keyser (eds.), *The View from Building 20*. Cambridge, Ma.: MIT Press, 111–176.
- Halle, Morris, and Alec Marantz. 1994. Some Key Features of Distributed Morphology. *MIT Working Papers in Linguistics* 21: 275–288.
- Harley, Heidi, and Rolf Noyer. 1999. State-of-the-Article: Distributed Morphology. *Glott International* 4.4: 3–9.
- Harley, Heidi, and Rolf Noyer. 2000. Formal versus Encyclopedic Properties of Vocabulary: Evidence from Nominalizations. In B. Peeters (ed.), *The Lexicon-Encyclopedia Interface*. Elsevier: Amsterdam.
- Hudson, Richard. 2000. Grammar without Functional Categories. In Borsley, Robert (ed.), *The Nature and Function of Syntactic Categories*. New York: Academic Press, 7–35.
- Jackendoff, Ray. 1973. The Base Rules for Prepositional Phrases. In Anderson, Stephen R., and Paul Kiparsky (eds.), *A Festschrift for Morris Halle*. New York: Holt, Rinehart, & Winston, 345–356.
- Jackendoff, Ray. 1977. *X'-Syntax: A Study of Phrase Structure*. Cambridge, Ma.: MIT Press.
- Koopman, Hilda. 2000. Prepositions, Postpositions, Circumpositions and Particles: The structure of Dutch PPs. In Hilda Koopman (ed.), *The syntax of specifiers and heads*. London: Routledge, 204–60.

Robert Joel Deacon

- Langacker, Ronald W. 1987. *Foundations of Cognitive Grammar: Theoretical Prerequisites*. 1. Stanford, Ca.: Stanford University Press.
- Marantz, Alec. 1997. No Escape from Syntax: Don't Try Morphological Analysis in the Privacy of Your Own Lexicon. *UPenn Working Papers in Linguistics* 4: 201–225.
- Marantz, Alec. 2001. Words and things. Ms., MIT.
- Mardale, A. 2011. Prepositions as a Semilexical Vategory. *Bucharest Working Papers in Linguistics* 13.2: 35–50.
- Muysken, Pieter. 2008. *Functional Categories*. Cambridge: Cambridge University Press.
- Schütze, Carson. 2001. Semantically Empty Lexical Heads as Last Resorts. In Corver, Norbert, and Henk van Riemsdijk (eds.), *Semi-Lexical Categories*. Berlin: Walter de Gruyter, 127–187.
- Svenonius, Peter. 2007. Adpositions, Particles and the Arguments They Introduce. In Reuland, Eric, Tanmoy Bhattacharya, and Giorgos Spathas (eds.), *Argument Structure*. Amsterdam: John Benjamins, 63–103.
- Svenonius, Peter. 2008. Spatial P in English. Ms., CASTL, University of Tromsø.
- Zeller, Jochen. 2001. Lexical Particles, Semi-Lexical Postpositions. In Corver, Norbert, and Henk van Riemsdijk (eds.), *Semi-Lexical Categories*. Berlin: Walter de Gruyter, 505–549.
- Zwarts, Jochen. 1995. Lexical and Functional Direction in Dutch. *Linguistics in the Netherlands* 12.1: 227–238.
- Zwarts, Jochen. 1997. Lexical and Functional Properties of Prepositions. In Haugmann, Dagmar, and Stefan J. Schierholz (eds.), *Grammatische Eigenschaften präpositionaler Elemente*. Tübingen: Linguistische Arbeiten 371: 1–18.