

Categorisation and categories

Phoevos PANAGIOTIDIS – University of Cyprus

Contents

<i>Approaches to lexical categories.....</i>	<i>2</i>
Generative approaches.....	2
Non-generative approaches.....	3
<i>Category as a matter of interpretive perspective.</i>	<i>3</i>
<i>Categorial features as LF-interpretable features.</i>	<i>4</i>
<i>Categorisers as (the only) lexical heads.....</i>	<i>4</i>
<i>The elusive functional-lexical distinction.....</i>	<i>5</i>
<i>Functional heads as lexical satellites supplying structural positions.</i>	<i>6</i>
<i>A solution: uninterpretable categorial features</i>	<i>7</i>
<i>Categorial Agree.....</i>	<i>8</i>
Definitions.....	8
Biuniqueness.....	9
The necessity of lexical heads (i.e. categorisers) in a derivation.....	9
We cannot merge lexical after we have started merging functional.....	9
Deciding the label.....	9
When a functional [<i>uX</i>] LI and a lexical [<i>X</i>] LI merge... ..	10
When a functional [<i>uX</i>] LI and an SO merge.....	10
<i>Mixed projections.</i>	<i>10</i>
<i>Approaching mixed projections.....</i>	<i>12</i>
<i>Functional categorisers, aka Switches.....</i>	<i>13</i>
<i>The Menagerie</i>	<i>14</i>
<i>Problem 1: Beyond the Menagerie.....</i>	<i>15</i>
<i>Problem 2: What kind of features would categorial features be?</i>	<i>15</i>
<i>From categorial features to category values: towards a Theory of Formal Features.....</i>	<i>17</i>
<i>How formal features as [<i>κ:Σ</i>]_δ solve our problems?</i>	<i>18</i>
<i>References.....</i>	<i>19</i>

Approaches to lexical categories.

What are nouns? What are verbs? What is their difference?

- Naïve notional approaches.
- Superficial morphological-distributional approaches.
- Lexical categories are *not* pigeonholes.
- Are nouns, adjectives and verbs prototypes?

Generative approaches

The Amherst system (Chomsky 1970; as revised in Jackendoff 1977)

[+N]	nouns, adjectives
[-N]	verbs, prepositions
[+V]	verbs, adjectives
[-V]	prepositions, nouns

Categorial *features*! Nice. Cross-classification of categories! Cool. But what do values [\pm N] and [\pm V] stand for? Are these merely taxonomic labels?

Is this cross-classification even correct?

Stowell (1981): feature specifications define *natural classes*; as they should:

- the [+N] categories project phrases where *of*-insertion applies in English,
- the [-N] categories assign Case,
- the [+V] categories can be prefixed with *un-*,
- the [-V] categories can be clefted.

Stowell's is the first *explanatory* theory of categorial features. Alas, it is wrong.

The Déchaine (1993) categorial system

[Nominal]	<i>Adjective</i>
[Nominal] [Referential]	<i>Noun</i>
[Referential]	<i>Verb</i>
–	<i>Preposition</i>
[Functional] [Nominal]	<i>Case</i>
[Functional] [Nominal] [Referential]	<i>Determiner</i>
[Functional] [Referential]	<i>Tense</i>
[Functional]	<i>Comp</i>

Similar in spirit to Stowell, but more refined and more complete.

The Baker (2003) categorial system: a mixed system.

	<i>semantic interpretation</i>	<i>syntactic behaviour</i>
[N]	sortality	referential index
[V]	predication	Specifier

Non-generative approaches

Langacker (1987):

Nouns conceptualise THING

Verbs conceptualise PROCESSES

Adjectives / adverbs conceptualise ATEMPORAL RELATIONS.

Emphasis on “conceptualise”.

Anderson (1997): categories are “**grammaticalisations** of cognitive – or notional – constructs”:

a feature P, standing for *predicability*

a feature N standing for the ability to function as an argument.

The resulting categories for English are the following:

{P}	auxiliary
{P;N}	verb
{P:N}	adjective
{N;P}	noun
{N}	name
{ }	functor

Category as a matter of interpretive perspective.

Synthesising the Amherst-Stowell-Déchine perspective with the Langacker-Anderson one (via Baker):

Lexical category is a matter of fundamental interpretive perspective.
 These perspectives are encoded as categorial features.
 Therefore, categorial features are LF-interpretable.

Remember: conceptual categorization ≠ linguistic categorization

Consider: although all physical objects are nouns cross-linguistically, not all nouns denote concepts of physical objects (D. Pesetsky, p.c.).

In other words, *rock* and *theory* cannot belong together in any useful or coherent, conceptual category. Still *rock* and *theory* are treated the same by grammar, even if they share no significant common properties notionally.

This is what I call ***fundamental interpretive perspective***. This idea originates in Langacker (1987), Uriagereka (1999), Baker (2003, 293–94) and closely interacts with Acquaviva (2009), (2014).

Categorial features as LF-interpretable features.

The story:

[N] imposes a sortal perspective on the categoriser's complement at LF.
 [V] imposes an extending-into-time perspective on the categorizer's complement at LF.

Sortality (after Baker 2003; already in Larson και Segal 1995, 128–32) as implemented in Prasada (2008) and Acquaviva (2014) is about the criterion of application *together with* that of identity (and individuation) –

Application: x applies to things of a certain kind, but not others

Identity: something which may replace A in the statement x is the same A as y

Extending into time (not predicativity / predicability) – following Uriagereka (1999) and Ramchand (2008, 38–42):

“both nouns and verbs correspond to mathematical spaces of various dimensions, the difference between them being whether those spaces are *seen as permanent or mutable*”.

Verbal constituents are inherently (sub-)eventive due to the temporal perspective contributed by the categorial feature [V].

Sortality will have to be associated with individuation, number, quantification etc. – realised as functional categories Number, Determiner etc.

‘Extending into time’ will be the seed of events and causation, and will require event participants, a way to encode length of event and relation between time intervals etc. – realised as an event projection / argument, Voice, Aspect, Tense.

Alternatively: ‘nouns lack temporal parts’ (Acquaviva 2014); [V] encodes abstract causation (Ilkhanipour 2013; cf. Darteni 2017, κεφ. 7).

Categorisers as (the only) lexical heads.

Assume a syntactic categorisation / syntactic decomposition framework – see Harley and Noyer (1998a), Embick (2000), Alexiadou (2001), Folli, Harley and Karimi (2003), Arad (2003) and (2005), Folli and Harley (2005), Harley (2005a), (2005b), (2007), (2009) and (2014), Marantz (2005) and (2006), Embick and Marantz (2008), Lowenstamm (2008), Acquaviva (2009), Basilico (2008), Volpe (2009), Acquaviva and Panagiotidis (2012) and, in a slightly different framework but in considerable detail, Borer (2005), (2009) and De Belder (2011).

On the one hand we have functional heads, on the other roots. Categorisers n and v host categorial features and are typically analysed as functional heads, but this is due to the

generalised confusion of what functional heads are (Panagiotidis 2011; 2015, κεφ. 5) – a matter to which we'll return.

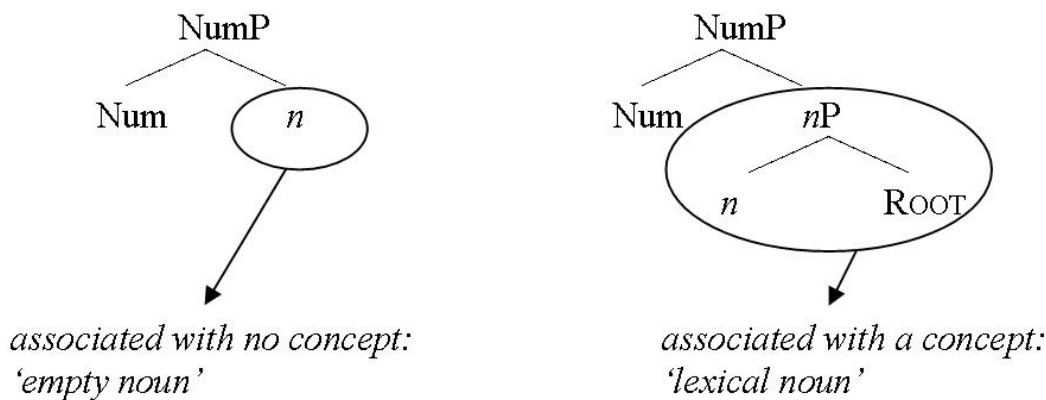
No functional head can directly categorise roots and root material; sub-categorial so-called “inner morphemes”, see Marantz (2000) and (2006), cannot categorise roots. Roots themselves are a-categorial (categoryless). Only categorisers categorise.

You can build a derivation solely on categorisers, without roots. In this case categorisers behave as so-called *semilexical categories* (Corver και Riemsdijk 2001), such as ‘empty nouns’ (Panagiotidis 2003). See van Riemsdijk (1998), Haider (2001), and Schütze (2001).

Roots and subcategorial material are – *syntactically* speaking – optional: a well-formed syntactic representation can be constructed using just a categoriser and superimposed functional structure.

Categorisers are the only lexical heads. They either categorise roots or recategorise already categorised structures (i.e. *fantasy* → *fantasise*).

For instance, this how the picture for nouns looks like:



The elusive functional-lexical distinction.

Nobody really has a *good* theory on the lexical-functional distinction.

Confusion is caused by

- Theta-assignment, e.g. Haegeman (2006)
- Descriptive content (but remember semi-lexical categories!)
- Abney's (1987, 64–65) oft-quoted criteria
- The open class-closed class distinction and the ensuing confusion with adjectives and Extended Projections (Cinque 2006, 4–6).

Functional categories are certainly peculiar beasts.

Muysken (2008) surveys their

- theoretical status and behavior,
- diachronic processes such as grammaticalization,
- acquisition,
- processing.

His conclusion is that there exist no unambiguous criteria for functional category membership:

“indeed there is an overall correspondence between the functional status of an element and its form, but that this correspondence cannot be captured by structural principles” (2008, 41).

“[V]ery few semantic features, if any, unambiguously characterise a class of elements that may be reasonably termed functional categories” (ibid.: 52).

The lexical-functional distinction is ultimately one that must be made theory-internally – as with most of the important analytical distinctions in scientific enquiry.

Functional heads as lexical satellites supplying structural positions.

What is the interpretation of categorial features on functional heads?

“Easy question”:

- [T] feature, anchoring in time;
- [C] would most likely encode illocutionary force;
- [D] would encode referentiality and, possibly, also deixis

Or a not so easy question:

- Focus, Topic, Mood, Aspect, Voice, and Quantifier, Number, Classifier...
- We can come up with features, but will they be *categorial* features? The case of split / unitary Complementisers (cf. Rizzi 1997; Preminger 2010; vs. Newmeyer 2004): would Focus, Topic or Force features *together* act as the categorial features a unitary Comp head, wherever available?

Chametzky (2000, 22–32; 2003, 213–19) and Hinzen (2006, 174) essentially take functional elements to be satellites of lexical heads. Already in Grimshaw’s (1991) *Extended Projection*, or Chomsky’s *Complete Functional Complex* (Chomsky 1986).

Functional elements are understood to belong to the same *supercategory* (Chomsky 2001, 47) as the lexical categories of which they form the functional entourage:

No matter how many functional categories are hypothesised, motivated and discovered, no actual proliferation of the number of *stricto sensu* parts of speech is necessary.

Functional elements are satellites of lexical ones, and functional categories *do not exist* as primitives of the grammar.

Functional elements are perhaps just collections of features in the Numeration which are flagged by a feature, as in Hegarty (2005).

Why ‘flagged’?

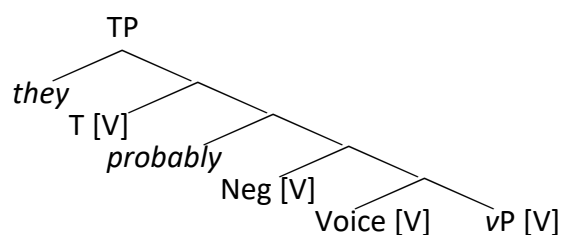
Because of what Felix (1990) calls *biuniqueness*, harking back to at least Martinet. Biuniqueness is the exclusive relationship between nouns and the nominal functional heads (D, Num etc.), and between verbs and the verbal/clausal functional heads (Voice, Asp, T, Mood etc.).

How to capture this?

Ouhalla (1991), Grimshaw (1991) van Riemsdijk (1998): Functional categories bear the categorial specification of the lexical head in their projection line.

Consider:

They will probably not finish it.



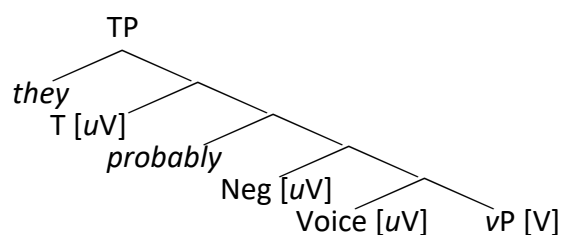
In the spine above there are simply too many [V] features:

What is the interpretation of each of them? And at the end of the day, the features meant to distinguish nouns from verbs cannot distinguish verbs from Tense or, worse, Voice.

And beware of features like [FUNC]!

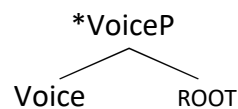
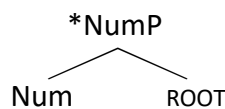
A solution: uninterpretable categorial features

Categorial Deficiency: functional elements bear the uninterpretable version of the categorial feature of the lexical head at the bottom of their projection line (cf. Panagiotidis 2002, κϕ. 5)



Why?

- Verbal/clausal functional heads will all be marked as [μ V], nominal ones as [μ N]; they will be distinguished from each other by virtue of their interpretable features, such as [voice], [tense], [aspect], [(illocutionary) force] and the like.
- Functional heads are just members of a verbal/clausal and a nominal supercategory (Chomsky 2001, 47; Chametzky 2000, 22–32; 2003, 213–19; Hinzen 2006, 174; already in Grimshaw 1991; 2003).
- *Functional ‘categories’ are not grammatical primitives* but the UG features they host *are*; e.g. number / individuation features *are* grammatical primitives; Num is *not* (such features could be borne by e.g. a classifier head).
- The lexical-functional distinction is real and sharp, and that there is no such thing as a lexical-functional gradient:
- In L1 acquisition functional categories tend to be acquired later: Radford (1990), (1996), Guilfoyle and Noonan (1992), Vainikka (1994). Selectively impaired in Specific Language Impairment or in cases of trauma: Muysken (2008, κεφ. 8–11) for a survey.



Recall: functional heads *cannot* categorise roots or anything else!

Categorial Agree.

Definitions

Agree (after Baker 2008, 48)

The ‘Probe’ agrees with the ‘Goal’ iff:

- The Probe c-commands the Goal – *the c-command condition* (Chomsky 2000, 122);
- There is no X such that the Probe c-commands X, X c-commands the Goal, and X has φ -features – *the intervention condition* (Chomsky 2000, 122);
- The Goal has not been rendered inactive by the Phase Impenetrability Condition – *the phase condition*; (Chomsky 2000, 108).

Probes project (Chomsky 2000, 133–34; 2004, 109; Hegarty 2005, 32; Donati 2006)

The Probe is always a head: a lexical item (LI) rather than a syntactic object (SO); the Probe (F) projects.

Thus, after the application of Merge:

The Probe, a head, projects.

Probes and Goals as features (Panagiotidis 2015, 126)

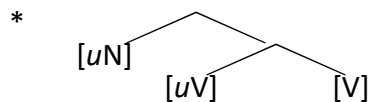
If [X] is an interpretable categorial feature, [uX] serves as Probe for the Goal [X], and not vice versa: [X] cannot ever act as a Probe for [uX] and [uX] can never act as a Goal.

In the light of the above, Categorical Deficiency buys us six essential characteristics of spines, which were hitherto partially explained, unexplained or stipulated:

Biuniqueness

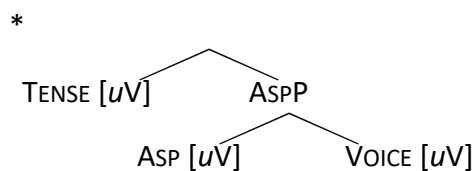
Biuniqueness reduces to the Probe-Goal matching requirement of (categorial) Agree: functional heads marked for [uV] will only appear in the Extended Projection of V (i.e. of v), which itself bears an interpretable [V] feature; functional heads marked for [uN] in that of N (i.e. of n), which itself bears an interpretable [N] feature.

Hence, a derivation like the one below would crash due to *feature mismatch*.



The necessity of lexical heads (i.e. categorisers) in a derivation

If [uX] cannot act as a Goal, then there is no Goal for the [uV] probes to agree with in a situation below, where there are no lexical heads, hence no interpretable categorial features to act as Goal.

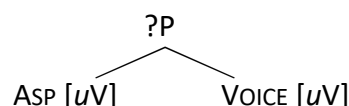


We cannot merge lexical after we have started merging functional

We cannot salvage the tree above by just merging a v in order to supply a Goal (v has an interpretable [V] feature): The Probe c -commands the Goal. Thus, we can derive that the lexical head appears always at the bottom of the spine!

Deciding the label

The tree above would not be possible to begin existing. Backtrack and go to the first step of Merge:



We saw that the Probe, a head, projects. In the scenario above both [uV] features can in principle be Probes for categorial Agree. Therefore both Asp and Voice would be possible to project. This in turn would result to

- i. optional labelling for the resulting constituent or
- ii. an intrinsic failure *of the system* to determine the head or
- iii. co-projection of both Asp and Voice.

I take it with Chomsky (1995, 244) that the last two options are impossible and I would think that the first one, that of optional labelling, is highly undesirable, too. See also Hinzen (2006, 187–89).

We derive that we cannot begin a tree by merging two functional heads.

When a functional [uX] LI and a lexical [X] LI merge...

... the functional LI, a Probe for categorial Agree, invariably projects.

Because Probes project. That's it.

When a functional [uX] LI and an SO merge...

the functional LI, a probe for categorial Agree, cannot be a specifier.

	<i>Predicted result</i>	<i>Example</i>
[uX] LI merges with [uX] LI	*	*[Asp Voice]
[uX] LI merges with [X] LI	[uX] LI <i>projects</i>	[_{DP} D <i>n</i>]
[uX] LI merges with SO (always [X])	[uX] LI <i>projects</i>	[_{DP} D NumP]
[uX] LI merges with root	*	*[Num CAT]
[X] LI merges with [X] LI	?	?
[X] LI merges with SO (always [X])	?	[_{VP} V <i>nP</i>]
[X] LI merges with root	?	[_{nP} <i>n</i> CAT]
SO merges with SO (both always [X])	?	[_{TP} [_{DP} the cat] [_{TP} meows]]

The above five points derive that whenever functional and lexical material merges, the result will be a projection line, *a spine*, with the lexical material at the bottom.

Therefore, we do not have to stipulate spines.

Mixed projections.

Mixed Projections are everywhere. Think of gerunds and nominalised infinitives.

Biuniqueness is flouted in mixed projections: they combine nominal *and* verbal/clausal elements.

Two examples:

English Poss-*ing* gerunds

[Godzilla's destroying the city] made it to the evening news.

We have Genitive assignment to *Godzilla's*, a nominal characteristic: the signature of a *Determiner* (or such).

We also have Accusative assignment to *the city*, a verbal characteristic, the signature of *Voice*.

Finally, English *-ing* only attaches to verbal stems.

Dutch 'expressive' nominalised infinitives (Schoorlemmer 2001; 2002)

Deze zanger is vervolgd voor [dat stiekem succesvolle
liedjes jatten]

This singer is prosecuted for [that sneakily successful
songs pinch.INF]

We have the demonstrative *dat*, a nominal characteristic: a *Determiner*.

We also have the adverb *stiekem*, a verbal characteristic.

We also have Accusative assignment to *succesvolle liedjes*, a verbal characteristic, the signature of *Voice*.

Finally, an infinitive, *jatten*, is a verb from.

N.B.: Mixed projections are different from lexical category changing! Compare English Poss-*ing* gerunds, a mixed projection, with 'mixed nominalisations', a deverbal noun (Harley & Noyer 1998b; Pires 2006; Moulton 2004):

The/John's destruction of the city (by John)	<i>derived nominal</i>
The/John's destroying of the city	<i>mixed nominalisation</i>
John's/*the destroying the city	<i>Poss-ing gerund</i>
*The/John's having examination of the student (by John)	<i>derived nominal</i>
*The/John's having examining of the student	<i>mixed nominalisation</i>
John's having examined the student	<i>Poss-ing gerund</i>
The/John's careless destruction of the city	<i>derived nominal</i>
The/John's careless destroying of the city	<i>mixed nominalisation</i>
John's/*the carelessly destroying the city	<i>Poss-ing gerund</i>

Approaching mixed projections

In grammatical theory there are generally three ways to approach them:

1. To write categorial duality into their head: Jackendoff (1977), Pullum (1991), Lapointe (1993), Bresnan (1997);
2. To argue for a structure where an abstract nominal element selects a verbal/clausal constituent: Baker (1985), Abney (1987) and Yoon (1996).
3. To claim biuniqueness is an illusion: nominal and verbal/clausal functional heads can freely mix in a spine (Alexiadou 2001).

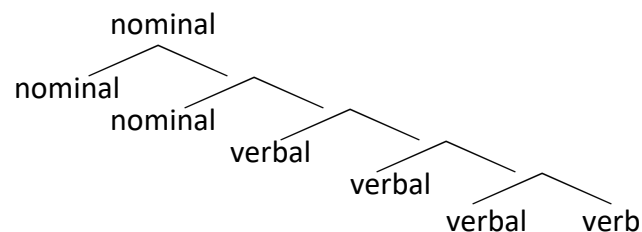
We will follow *the first two*, reconciling them.

Why not go free mixing? Why not *freely* mix together any kind of functional heads, e.g. D with Asp, T with Num, D with Voice, T with D?

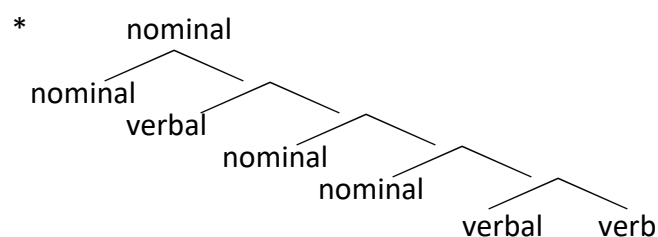
Because of the following two generalisations:

Phrasal Coherence: the mixed projection “can be partitioned into two categorially uniform subtrees such that one is embedded as a constituent of the other” (Bresnan 1997, 4; Borsley και Kornfilt 2000; after Malouf 2000).

A mixed projection abiding by Phrasal Coherence



A mixed projection *not* abiding by Phrasal Coherence



Nominal external behaviour: mixed projections externally behave as *nominal* constituents (Panagiotidis 2015, 139; after Malouf 2000; Borsley και Kornfilt 2000; Hudson 2003)

Okay, but

- How are mixed projection even possible?
- (How) is biuniqueness flouted?

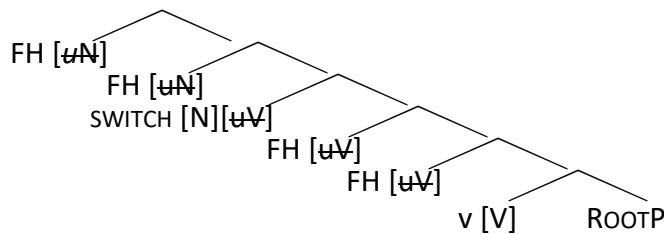
Functional categorisers, aka Switches

It is *not* flouted: **Switches**, i.e. functional categorisers, mediate between the two categorially distinct functional subtrees (Lapointe 1999).

As categorizers, they bear [N]. As 'functional', they bear [μ V].

Questions:

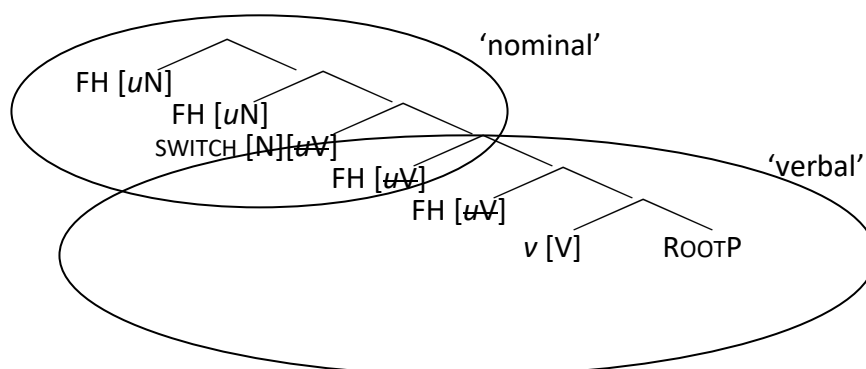
1. Is it possible for two categorial features to co-exist on a single head?
Yes, if only one is interpretable.
2. How come this co-existence does not induce a categorial clash?
See above.
3. What does it mean (LF-wise) for a syntactic head to be specified as [N] [μ V]?
See below:



We have morphologically overt switches in Basque (*-te / -tze*), Turkish ('factive nominalisers' *dlk* and *AcAk*), Korean (*-um*).

So, mixed projections are actually business as usual, spines of the usual sort, with a category-changing functional item.

Their existence is a consequence of LF-(un)interpretable categorial features and – of course – the local nature of (categorial) Agree.



The Menagerie

	roots	subcategorial elements	functional categorizers	functional heads	categorisers
<i>made of</i>	? (not UG features)	UG-features	UG-features	UG-features	UG-features
<i>categorial status</i>	Category-less	category-less	Both interpretable and uninterpretable categorial features	uninterpretable categorial feature	categorial feature
<i>aka</i>	descriptive elements	inner morphemes	SWITCH	functional categories	lexical heads
<i>some members</i>	Roots	particles, low applicatives, low causatives	functional nominalizer	Voice, Asp, T, C, D, Num	<i>n, v, SWITCH</i>
<i>examples</i>	CAT, WORK, KTB	-ee, de-, up, in, syn-	-ing (?)	to, will, if, the, -s	-ment, -th

Problem 1: Beyond the Menagerie

Alas, the Menagerie is incomplete.

Hybrid morphological units — i.e., units that pretheoretically appear to bear both lexical and functional properties — do not obviously fit in the above taxonomy:

- Affixoids and Combining Forms, i.e. “bound forms that cannot have a syntactic realization” (Amiot και Dugas 2020, 6); elements like *-wise*, *-key*, *-berry*, *-gate*, *anthropo-*, *-path*, *-holic-*, *anarcho-*, *multi-*, *-cide*, *-vorous*, *-logy* etc.
- Contentful derivational morphemes.

Affixoids: forms that do appear free but with different interpretations (e.g. *-gate*)

Combining forms (CFs): forms that do not appear free (e.g. *-cide* and *-holic*).

Affixoids and CFs could be composed of purely semantic features and/or ‘morphosemantic features’ (Svenonius 2019, 5). However, these do not exist (Clark 2020, 6; Panagiotidis 2022).

Affixoids and CFs look like they involve a root but not one that is realisable as an independent ‘word’, cf. *-gate* or *anthropo-*. They somehow seem to be *category-typed* but not independently *categorised*: they *belong* to a categorial environment but do not bear category independently.

Contentful derivational morphemes, like *-ist* can be sometimes hard to distinguish from affixoids and CFs.

The transpositional / category-changing ones may always be thought as *categorisers* involving a root (e.g. *-ment*) or no root at all (e.g. *-ness*, *-ize*).

The non-transpositional / non-category-changing / homocategorial ones, including diminutives and many more, may also be thought as involving a root (e.g. *-eir-* ‘tree’ in Portuguese) or no root at all (e.g. *-let*). Crucially, they are also *category-typed*.

Where can we squeeze them in the Menagerie? This is at best unclear.

Problem 2: What kind of features would categorial features be?

As seen above, categorial features are conceived as privative (Déchaine 1993; Baker 2003; Panagiotidis 2011).

A conceptual issue with privative features in general:

“Privative [...] characterizes systems where atomic features may be present or absent, but have no other properties” (Adger 2010, 187).

The privative (unary / monovalent) feature system is hence conceptually the simplest: a feature either is there or isn't there. This is very attractive, but Adger and Svenonius (2011) thoroughly discuss the limitations of privative feature systems in defining natural classes: how do we capture that [V] and [N] belong to the same *natural class*?

An issue with categorial features as privative:

Categorial features appear to be universal and fundamental: if nothing else, they define the interpretive perspective of the Extended Projection / Spine inside which they are embedded.

They however seem to do very little by way of grammatical activity: if the above are anything to go by, this is restricted to an Agreement and checking relation with the uninterpretable versions of themselves borne by functional heads – and that's it. Here, let us notate these uninterpretable versions with a star:

[*N]... [*N]... [*N]... [*N]... [N]

[*V]... [*V]... [*V]... [*V]... [V]

But what about (root-based) non-transpositional / homocategorial elements, including derivational morphemes, CFs, and affixoids?

Can we fit them into a privative categorial feature system?

Let's try, making the initial guess that non-transpositional / homocategorial elements *bear unvalued categorial features*.

<i>Lexical</i>	<i>Functional</i>	<i>non-transpositional</i>
[N]	[*N]	[<i>u</i> N]
[V]	[*V]	[<i>u</i> V]

This is already problematic, because now we have introduced the *meta*-feature 'unvalued': what does it mean for an atomic monovalent feature to be unvalued? Along with this, we have kept the similarly suspect uninterpretable features [*N] and [*V], with 'uninterpretability' being the reflex of another meta-feature perhaps.

What about going for binary categorial features in an equipollent system? According to Harbour's (2011, 561–62) conceptualisation of binary systems, both [+X] and [-X] values receive distinct interpretations. On top of that

- a \emptyset option is available (when the feature [X] is not there) and
- uninterpretability is overspecified as [+X -X] (Harbour 2007, 76–78; 2011, 568–69).

Assuming that [N] is interpreted as sortal perspective on the concept (Baker 2003; Panagiotidis 2015), we would get a system like this, where [-N] will be interpreted as the extending-into-time perspective (Panagiotidis 2015):

<i>Lexical</i>	<i>Functional</i>	<i>non-transpositional</i>
[+N]	[+N][-N]	[<i>u</i> N]
[-N]	?	?

Observe that not all slots are filled in, whereas the [*u*N] designation is again suspect in a purely binary / equipollent system.

What about finally resorting to an [attribute:value] notation? Panagiotidis (2015, 104–5) half-heartedly proposes, and then retracts, that “[N] should perhaps be recast as [perspective:sortal], [V] as [perspective:temporal], while [Farsi] Classless Words would perhaps be introduced by a categorizer with an unvalued [perspective:] feature”:

<i>Lexical</i>	<i>Functional</i>	<i>non-transpositional</i>
[perspective:sortal]	*[perspective:sortal]	[perspective:]
[perspective:temporal]	*[perspective:temporal]	[perspective:]

Although now we can say something about non-category changing derivational morphology in terms of unvaluedness, the resulting system cannot distinguish verbal from nominal non-transpositional morphology. Finally, unless we are ready to make a (rather desperate) stand for uninterpretable feature specifications, the categorial identity of functional heads is undefinable.

We reach the point where categorial features, which are supposed to condition categorial relations, do not seem to behave as a system in an adequate manner for the purpose of doing so.

From categorial features to category values: towards a Theory of Formal Features

The solution to the above problem should make reference to spines.

We have already tried capturing spines as a court of functional satellites in the same projection line as the lexical head. Still, the categorial Agree system only circumstantially guarantees their uniformity. To wit, could a grammar assemble a nominal [imperfective] head, i.e. a [*u*N] one?

Based on joint work with Vitor Nóbrega, I will propose that domain and spine information must be incorporated within the actual definition of a formal feature.

We thus conceive formal features as formative features

$$[\kappa:\Sigma]_{\delta}$$

Explaining:

- a. κ corresponds to the universal *category / domain*, from which the formative was derived (Wiltschko 2014): Linking, Anchoring, Point-Of-View, Classification;
- b. Σ corresponds to the semantic unit individuating the formative, e.g. Imperfective;
- c. δ corresponds to the interpretive perspective that *each formative feature attributes to its complement* – this incorporates spine participation into every formal feature.

Thus, if $\delta=[N]$, then its complement must be interpreted as a sortal predicate, if $\delta=[V]$, then its complement must be interpreted as something extensible-into-time.

Ordering within a spine is partially captured by the following universal schema:

$$K_{\text{LINK}} > K_{\text{ANCHOR}} > K_{\text{POV}} > K_{\text{CLASS}}$$

Every formal feature is of the $[\kappa:\Sigma]_{\delta}$ format: it both a) signifies and b) imposes an interpretive perspective on its structural complement

This approach renders the existence of spines and their domains not superfluous or accidental, but an actual outcrop of how features work almost as Borerian (2005) functors.

Formal features have both interpretive as well as structural relevance and they define well-formed extended projections.

How formal features as $[\kappa:\Sigma]_{\delta}$ solve our problems?

Biuniqueness and phrasal coherence are solved by definition

Categorisers: any K_{CLASS} category feature can categorise a root (this is fine).

Functional heads: (bundles of) $[\kappa:\Sigma]_{\delta}$ formatives

What about SWITCH heads (i.e. functional categorisers), other category-changing elements etc?

These are dealt with by the interplay between κ and δ :

<i>κ-layer</i>	<i>δ-value</i>	Examples:
different	identical	functional
identical	different	Transpositional (category changing) elements; SWITCH heads
Identical	Identical	Non-transpositional elements
Different	Different	* non-coherent

What about CFs and affixoids?

These are roots that are directly assigned a δ (but no κ , by definition). They *category-typed* but not independently *categorised*. Examples:

- GATE → freely categorizable as a noun (*gate*), verb (*gate*) etc.
- GATE_[N] → category-typed meaning ‘scandal’.
- CIDE → *unavailable*
- CIDE_[N] → category-typed meaning ‘murder’.

Categorisation of a root, a grammatical process, is thus distinguished from category-typing roots, which restricts them to a particular interpretive perspective.

Categorisation gives us nouns, verbs, adjectives (with or without roots); category-typing straddles roots to specific δ 's.

References

- Abney, Steven P. 1987. ‘The English noun phrase in its sentential aspect’. PhD thesis, Cambridge, Mass.: MIT.
- Acquaviva, Paolo. 2009. ‘Roots and lexicality in Distributed Morphology’. Στο *York-Essex Morphology Meeting 5: Special Issue of York Working Papers in Linguistics*, επιμέλεια Alexandra Galani, Daniel Redinger, και Norman Yeo, 2:1–21. York: University of York. <http://ling.auf.net/lingbuzz/000654>.
- . 2014. ‘The Roots of Nominality, the Nominality of Roots’. Στο *The syntax of roots and the roots of syntax*, επιμέλεια Artemis Alexiadou, Hagit Borer, και Florian Schäfer, 33–56. Oxford studies in theoretical linguistics. Oxford ; New York: Oxford University Press.
- Acquaviva, Paolo, και Phoevos Panagiotidis. 2012. ‘Lexical decomposition meets conceptual atomism’. *Lingue e Linguaggio* XI (2): 105–20.
- Adger, David. 2010. ‘A Minimalist Theory of Feature Structures’. Στο *Features, Perspectives on a Key Notion in Linguistics*, επιμέλεια Anna Kibort και Greville G. Corbett, 185–218. Oxford ; New York: Oxford University Press.
- Adger, David, και Peter Svenonius. 2011. *Features in Minimalist Syntax*. Oxford handbooks online. Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199549368.013.0002>.
- Alexiadou, Artemis. 2001. *Functional Structure in Nominals: Nominalization and Ergativity*.

- Amsterdam [etc.]: John Benjamins.
- Amiot, Dany, και Edwige Dugas. 2020. 'Combining Forms and Affixoids in Morphology'. Στο *Oxford Research Encyclopedia of Linguistics*, στον συλλ. τόμο Dany Amiot και Edwige Dugas. Oxford University Press. <https://doi.org/10.1093/acrefore/9780199384655.013.569>.
- Anderson, John M. 1997. *A notional theory of syntactic categories*. Cambridge studies in linguistics 82. Cambridge ; New York: Cambridge University Press.
- Arad, Maya. 2003. 'Locality constraints on the interpretation of roots: The case of Hebrew denominal verbs'. *Natural Language and Linguistic Theory* 21: 737–78.
- . 2005. *Roots and Patterns Hebrew Morpho-Syntax*. Dordrecht: Springer Verlag.
- Baker, Mark C. 1985. 'The Mirror Principle and morphosyntactic explanation'. *Linguistic Inquiry* 16: 373–415.
- . 2003. *Lexical categories: verbs, nouns, and adjectives*. Cambridge studies in linguistics. Cambridge, UK; New York: Cambridge University Press.
- . 2008. *The syntax of agreement and concord*. Cambridge studies in linguistics 115. Cambridge ; New York: Cambridge University Press.
- Basilico, David. 2008. 'Particle verbs and benefactive double objects in English: high and low attachments'. *Natural Language and Linguistic Theory*, 731–73.
- Borer, Hagit. 2005. *In name only*. Structuring sense, volume I. Oxford; New York: Oxford University Press.
- . 2009. 'Roots and categories'. Talk παρουσιάστηκε στο 19th Colloquium on Generative Grammar, University of the Basque Country, Vitoria-Gasteiz, Spain, Απρίλιος.
- Borsley, Robert, και Jaklin Kornfilt. 2000. 'Mixed extended projections'. Στο *The nature and function of syntactic categories.*, επιμέλεια Robert Borsley, 101–31. New York: Academic Press.
- Bresnan, Joan. 1997. 'Mixed Categories as head sharing constructions'. Στο *Proceedings of the LFG97 Conference*, επιμέλεια Miriam Butt και Tracy Holloway-King, 1–17. Stanford, Calif.: CSLI Publications.
- Chametzky, Robert. 2000. *Phrase structure: from GB to minimalism*. Generative syntax 4. Malden, Mass: Blackwell.
- . 2003. 'Phrase structure'. Στο *Minimalist syntax*, επιμέλεια Randal Hendrick, 192–225. Oxford; Malden, Mass.: Blackwell.
- Chomsky, Noam. 1970. 'Remarks on nominalization'. Στο *Readings in English transformational grammar*, επιμέλεια Roderick Jacobs και Peter Rosenbaum, 184–221. Waltham, Mass.: Ginn & Company.
- . 1986. *Knowledge of language: its nature, origin, and use*. Convergence. New York: Praeger.
- . 1995. *The minimalist program*. Current studies in linguistics 28. Cambridge, Mass: The MIT Press.
- . 2000. 'Minimalist inquiries: The framework.' Στο *Step by Step. Essays on Minimalist Syntax in honor of Howard Lasnik*, επιμέλεια Roger Martin, David Michaels, και Juan Uriagereka, 89–155. Cambridge, Mass: MIT Press.
- . 2001. 'Derivation by phase'. Στο *Ken Hale: a life in language*, επιμέλεια Michael Kenstowicz, 1–52. Cambridge, Mass.: MIT Press.
- . 2004. 'Beyond explanatory adequacy'. Στο *Structures and Beyond*, επιμέλεια Adriana Belletti, 104–31. Oxford ; New York: Oxford University Press.
- Cinque, Guglielmo. 2006. *Restructuring and functional heads*. The cartography of syntactic structures, v. 4. Oxford; New York: Oxford University Press.
- Clark, Brady. 2020. 'The Evolvability of Words: On the Nature of Lexical Items in Minimalism'. *Frontiers in Psychology* 10 (Ιανουάριος): 3071. <https://doi.org/10.3389/fpsyg.2019.03071>.
- Corver, Norbert, και Henk C. van Riemsdijk, επιμ. 2001. *Semi-lexical categories: the function of content words and the content of function words*. Studies in generative grammar 59. Berlin ; New York: Mouton de Gruyter.
- Darteni, Silvia. 2017. 'Italian parasynthetic verbs – Argument Structure'. PhD thesis, Paris: Paris VIII.

- De Belder, Marijke. 2011. *Roots and affixes: eliminating lexical categories from syntax*. Utrecht: LOT.
- Déchaine, Rose-Marie. 1993. 'Predicates across categories'. PhD thesis, Amherst: University of Massachusetts.
- Donati, Caterina. 2006. 'Labels and Merge'. Στο . University of Cyprus, Nicosia.
- Embick, David. 2000. 'Features, Syntax, and Categories in the Latin Perfect'. *Linguistic Inquiry* 31: 185–230.
- Embick, David, και Alec Marantz. 2008. 'Architecture and blocking. Linguistic Inquiry'. *Linguistic Inquiry* 39: 1–53.
- Felix, Sascha. 1990. 'The structure of functional categories'. *Linguistische Berichte* 125: 46–71.
- Folli, Rafaella, και Heidi Harley. 2005. 'Consuming results in Italian & English: Flavours of v'. Στο *Aspectual inquiries*, επιμέλεια Paula Kempchinsky και Roumyana Slabakova, 1–25. Dordrecht: Springer Verlag.
- Folli, Rafaella, Heidi Harley, και Simin Karimi. 2003. 'Determinants of event type in Persian complex predicates.' Στο *Cambridge Occasional Papers in Linguistics*, επιμέλεια Luisa Astruc και Marc Richards, 1:100–120. Cambridge, UK: University of Cambridge.
- Grimshaw, Jane B. 1991. 'Extended Projection'. Unpublished ms. Brandeis University.
- Grimshaw, Jane B. 2003. *Words and structure*. CSLI lecture notes, no. 151. Stanford, Calif: CSLI Publications.
- Guilfoyle, Ethne, και Máire Noonan. 1992. 'Functional categories and language acquisition'. *Canadian Journal of Linguistics* 37: 241–72.
- Haegeman, Liliane M. V. 2006. *Thinking syntactically: a guide to argumentation and analysis*. Blackwell textbooks in linguistics 20. Malden, MA: Blackwell Pub.
- Haider, Hubert. 2001. 'Heads and selection'. Στο *Semi-lexical categories*, επιμέλεια Norbert Corver και Henk van Riemsdijk, 67–96. Berlin; New York: Mouton de Gruyter.
- Harbour, Daniel. 2007. *Morphosemantic number: from Kiowa noun classes to UG number features*. Studies in natural language and linguistic theory, v. 69. Dordrecht, The Netherlands: Springer.
- . 2011. 'Valence and atomic number'. *Linguistic Inquiry* 42 (4): 561–94.
- Harley, Heidi. 2005a. 'Bare phrase structure, a-categorial roots, one-replacement and unaccusativity'. Στο *Harvard Working Papers on Linguistics*, επιμέλεια Slava Gorbachov και Andrew Nevins, 9:1–19. Cambridge, Mass.: Harvard.
- . 2005b. 'How do verbs get their names? Denominal verbs, Manner Incorporation and the ontology of verb roots in English'. Στο *The syntax of aspect: Deriving thematic and aspectual interpretation*, επιμέλεια Nomi Erteschik-Shir και Tova Rapoport, 42–64. Oxford ; New York: Oxford University Press.
- . 2007. 'The bipartite structure of verbs cross-linguistically, or why Mary can't exhibit John her paintings.' Talk παρουσιάστηκε στο ABRALIN Congres 2007, UFMG, Belo Horizonte, Brazil, Μάρτιος.
- . 2009. 'The morphology of nominalizations and the syntax of vP'. Στο *Quantification, Definiteness, and Nominalization*, επιμέλεια Anastasia Giannakidou και Monika Rathert, 320–42. Oxford ; New York: Oxford University Press.
- . 2014. 'On the identity of roots'. *Theoretical Linguistics* 40 (3/4): 225–76.
- Harley, Heidi, και Rolf Noyer. 1998a. 'Licensing in the non-lexicalist lexicon: nominalizations, vocabulary items and the Encyclopaedia'. *MIT Working Papers in Linguistics* 32: 119–37.
- . 1998b. 'Mixed nominalizations, short verb movement and object shift in English'. Στο *Proceedings of NELS 28*, επιμέλεια Pius N. Tamanji, Heidi Harley, Rolf Noyer, και Kiyomi Kusumoto, 1–15.
- Hegarty, Michael. 2005. *A feature-based syntax of functional categories: the structure, acquisition, and specific impairment of functional systems*. Studies in generative grammar 79. Berlin ; New York: Mouton de Gruyter.
- Hinzen, Wolfram. 2006. *Mind design and minimal syntax*. Oxford ; New York: Oxford University Press.

- Hudson, Richard. 2003. 'Gerunds without phrase structure'. *Natural Language and Linguistic Theory* 21: 579–615.
- Ilkhanipour, Negin. 2013. 'On the semantics of little v'. Στο . Leiden.
- Jackendoff, Ray. 1977. *X Syntax: A Study of Phrase Structure*. Cambridge, Mass.: MIT Press.
- Langacker, Ronald W. 1987. *Foundations of Cognitive Grammar*. Stanford, Calif.: Stanford University Press.
- Lapointe, Steve. 1993. 'Dual lexical categories and the syntax of mixed category phrases'. Στο *ESCOL '93*, επιμέλεια Andreas Kathol και Michael Bernstein, 199–210. Columbus, Ohio: Ohio State University.
- . 1999. 'Dual lexical categories vs. phrasal conversion in the analysis of gerund phrases'. Στο *University of Massachusetts Occasional Papers in Linguistics 24: Papers from the 25th Anniversary*, επιμέλεια Paul DeLacy και Anita Nowak, 157–89. Amherst, Mass.: GLSA Publications.
- Larson, Richard K., και Gabriel Segal. 1995. *Knowledge of meaning: an introduction to semantic theory*. Cambridge, Mass: MIT Press.
- Lowenstamm, Jean. 2008. 'On n, v, and types of nouns.' Στο *Sounds of silence: empty elements in syntax and phonology*, επιμέλεια Jutta M. Hartmann, Veronika Hegedüs, και Henk van Riemsdijk, 107–44. North Holland Linguistic Series, Linguistic Variations. Amsterdam: Elsevier.
- Malouf, Robert. 2000. 'Verbal gerunds as mixed categories in Head-Driven Phrase Structure Grammar'. Στο *The nature and function of syntactic categories.*, επιμέλεια Robert Borsley, 133–66. New York: Academic Press.
- Marantz, Alec. 2000. 'Words'. Unpublished ms. NYU.
- . 2005. 'Rederived generalizations'. Unpublished ms. MIT.
- . 2006. 'Phases and Words'. Unpublished ms. MIT.
https://files.nyu.edu/ma988/public/Phase_in_Words_Final.pdf.
- Moulton, Keir. 2004. 'External arguments and gerunds'. *Toronto Working Papers in Linguistics* 22: 121–36.
- Muysken, Pieter. 2008. *Functional categories*. Cambridge; New York: Cambridge University Press.
- Newmeyer, Frederick J. 2004. 'On Split-CPs, Uninterpretable Features, and the 'Perfectness' of Language'. *ZAS Papers in Linguistics* 35: 399–422.
- Ouhalla, Jamal. 1991. *Functional categories and parametric variation*. Theoretical linguistics. London; New York: Routledge.
- Panagiotidis, Phoevos. 2002. *Pronouns, Clitics and Empty Nouns: 'pronominality' and Licensing in Syntax*. Amsterdam; Philadelphia: John Benjamins Pub. Co.
- . 2003. 'Empty nouns'. *Natural Language and Linguistic Theory* 21: 381–432.
- . 2011. 'Categorial features and categorizers'. *The Linguistic Review* 28: 325–46.
- . 2015. *Categorial features: a generative theory of word class categories*. Cambridge studies in linguistics 145. Cambridge; New York: Cambridge University Press.
- . 2022. 'Towards a (minimalist) Theory of Features: preliminary notes'. Unpublished ms. Nicosia. <https://ling.auf.net/lingbuzz/005615>.
- Pires, Acrisio. 2006. *The minimalist syntax of defective domains: gerunds and infinitives*. Linguistik aktuell = Linguistics today, v. 98. Philadelphia: John Benjamins Pub. Co.
- Prasada, Sandeep. 2008. 'Aspects of a fully psychological theory of sortal representation'. Unpublished ms. Hunter College, CUNY, New York.
- Preminger, Omer. 2010. 'Nested Interrogatives and the Locus of Wh'. Στο *The Complementizer Phase: subjects and operators*, επιμέλεια Phoevos Panagiotidis, 200–235. Oxford ; New York: Oxford University Press.
- Pullum, Geoffrey. 1991. 'English nominal gerund phrases as noun phrases with verb phrase heads'. *Linguistics* 29: 763–99.
- Radford, Andrew. 1990. *Syntactic theory and the acquisition of English syntax: the nature of early child grammars of English*. Oxford, UK ; Cambridge, Mass., USA: Blackwell.
- . 1996. 'Towards a structure-building model of acquisition'. Στο *Generative Perspectives on*

- Language Acquisition*, επιμέλεια Harald Clahsen, 43–89. Amsterdam; Philadelphia: John Benjamins Pub. Co.
- Ramchand, Gillian. 2008. *Verb meaning and the lexicon: a first-phase syntax*. Cambridge studies in linguistics 116. Cambridge, UK ; New York: Cambridge University Press.
- Riemsdijk, Henk van. 1998. 'Categorial feature magnetism: the endocentricity and distribution of projections'. *Journal of Comparative Germanic Linguistics* 2: 1–48.
- Rizzi, Luigi. 1997. 'The fine structure of the left periphery'. Στο *Elements of grammar: a handbook of generative syntax*, επιμέλεια Liliane M. V. Haegeman, 281–337. Dordrecht: Kluwer.
- Schoorlemmer, Maaïke. 2001. 'Dutch nominalised infinitives as non-identical twins'. UiL OTS Working Paper uil-ots-01005-CL/TL. Utrecht University.
- . 2002. 'Adjectives and adverbs in Dutch nominalised infinitives'. Στο . Utrecht.
- Schütze, Carson. 2001. 'Semantically empty lexical heads as last resorts'. Στο *Semi-lexical categories*, επιμέλεια Norbert Corver και Henk van Riemsdijk, 127–87. Berlin; New York: Mouton de Gruyter.
- Stowell, Tim. 1981. 'Origins of Phrase Structure'. PhD thesis, Cambridge, Mass.: MIT.
- Svenonius, Peter. 2019. 'Syntactic Features'. Στο *Oxford Research Encyclopedia of Linguistics*, στον συλλ. τόμο Peter Svenonius. Oxford University Press.
<https://doi.org/10.1093/acrefore/9780199384655.013.179>.
- Uriagereka, Juan. 1999. 'Warps: some thoughts on categorization'. *Theoretical Linguistics* 25: 31–73.
- Vainikka, Anne. 1994. 'Case in the development of English syntax'. *Language Acquisition* 3: 257–325.
- Volpe, Mark. 2009. 'Root and deverbal nominalizations: Lexical flexibility in Japanese.' Unpublished ms. <http://ling.auf.net/lingBuzz/000789>.
- Wiltschko, Martina. 2014. *The universal structure of categories: towards a formal typology*. Cambridge studies in linguistics 142. Cambridge, United Kingdom: Cambridge University Press.
- Yoon, James Hye Suk. 1996. 'Nominal gerund phrases in English as phrasal zero derivations'. *Linguistics* 34: 329–56.

phoevos@ucy.ac.cy