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How Many Word-Classes Are There After All?

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Problems addressed:

- What is a word class?
- What's the significance of word-classes?
 - in morphology, syntax, and in general: in linguistic theories
- How to define word-classes?
 - distributional criteria, lexical definitions or something completely different?

Why interesting from the viewpoint of morphology?

- Because most morphological analyses and processes refer to word-classes
- and raise problems of rules, generalizations, etc., involving word-class membership
- Throughout ‘word’ taken for granted – though various difficulties of definitions:
- semantic, phonological, morphological, grammatical ‘words’ – vary with definitions.

Proposal:

- **Word-class:**
 - a) status denied to closed classes
 - b) concept dissolved as combination or clustering of features/properties for open classes
- Consequences for classification of affixes
- Viewing 'word-classes' in wider context → circularity disappears.

How many word-classes are there?

- Well, pick your choice:
- **from EIGHT** – in traditional grammars from Τέχνη Γραμματική onward:
- Surviving in modern times as Nouns, Verbs, Adjectives, Adverbs,
- then Pronouns (?), Prepositions, Conjunctions, Interjections (!) → grab bags

- From **eight** to:
- **Indefinite numbers**, cf. from the 1960's:
- “as many classes are set up as words of different formal behaviour are found”
(Robins 1964)
- “a multitude of single member classes”
(Crystal 1967)
- “very few words have an identical formal behaviour, even in a given restricted grammatical environment” (ibid.)

Previous approaches 1:

The classic notional definition - 1660:

30 GRAMMAIRE GENERALE
plus generale distinction des mots, soit que les vns signifient les objets des pensées, & les autres la forme & la maniere de nos pensées, quoy que souuent ils ne la signifient pas seule, mais avec l'objet, comme nous le ferons voir.

Les mots de la premiere sorte sont ceux que l'on a appellez *noms, articles, pronoms, participes, prepositions, & aduerbes*. Ceux de la seconde, sont *les verbes, les conjonctions, & les interjections*. Qui sont tous tirez par vne suite necessaire de la maniere naturelle en laquelle nous exprimons nos pensées, comme nous l'allons monstrier.

CHAPITRE II.

Des noms, & premierement des substantifs & adjectifs.

Les objets de nos pensées, sont ou les choses, comme *la terre, le Soleil, l'eau, le bois*, ce qu'on appelle ordinairement *substance*. Ou la maniere des choses; comme d'estre *rond, d'estre rouge, d'estre dur, d'estre sc̄auant*, &c. ce qu'on appelle *accident*.

Et il y a cette difference entre les choses ou les substances, & la maniere des choses ou les accidents; que les substances subsi-

ET RAISONNÉE. 31

stent par elles-mesmes, au lieu que les accidents ne sont que par les substances.

C'est ce qui a fait la principale difference entre les mots qui signifient les objets des pensées. Car ceux qui signifient les substances, ont esté appellez *noms substantifs*; & ceux qui signifient les accidents, en marquant le sujet auquel ces accidents conuiennent, *noms adjectifs*.

Voila la premiere origine des *noms substantifs & adjectifs*. Mais on n'en est pas demeuré-là: & il se trouue qu'on ne s'est pas tant arresté à la signification, qu'à la maniere de signifier. Car parce que la substance est ce qui subsiste par soy-mesme, on a appellé noms substantifs tous ceux qui subsistent par eux-mesmes dans le discours, sans auoir besoin d'un autre nom, encore mesme qu'ils signifient des accidents. Et au contraire on a appellé adjectifs ceux mesmes qui signifient des substances, lors que par leur maniere de signifier, ils doiuent estre joints à d'autres noms dans le discours.

Or ce qui fait qu'un nom ne peut subsister par soy-mesme, est quand outre sa signification distincte; il y en a encore vne confuse, qu'on peut appeller connotation d'une chose, à laquelle conuient ce qui est

- “Les objets de nos pensées, sont ou les choses, comme *la terre, le Soleil, l’eau, le bois*, ce qu’on appelle ordinairement *substance*. Ou la maniere des choses; comme d’estre *rond, d’estre rouge, d’estre dur*, [...] &c. ce qu’on appelle *accident*. [...] Car ceux qui signifient les substances, ont esté appellez *noms subsantifs*; & ceux qui signifient les accidens, en marquant le sujet auquel ces accidens conuiennent, *noms adjectifs*.”

Claude Lancelot & Antoine Arnauld, *Grammaire générale et raisonnée*.

Previous approaches 2: Structuralist

- “The noun is a word-class; like all other form-classes, it is to be defined in terms of **grammatical features** [...] When it has been defined, it shows a **class-meaning** which can be roughly stated as follows ‘object of such and such a species’; examples are *boy, stone, water, kindness.*” (Bloomfield 1933, emphasis added)

Previous approaches 2: Structuralist

- “[The pattern of interchangeability] defines a form-class which includes *she, he, it, John, Mary, the man at the corner, my friend Bill*, and so on endlessly, but which by no means includes all forms, since we can name many which are excluded: *her, him, them, me, yes, no, ripe, find her, go with us tomorrow.*” (Hockett 1958)
- Note: form-class = **words and phrases.**

Current approaches 1:

(cf. also Wälchli 2008)

- *Constructionists*: Croft 2005
- “Rigorous application of the distributional method would lead to a myriad of word classes, indeed, each word would probably belong to its own word class.” (cf. Robins; Crystal)
- Parts of speech = linguistic universals, not language-specific word-classes → *to be questioned*
- „Whatever identifying criteria we use for parts of speech – meaning, syntactic function, or inflection – the relationship between particular criteria and particular parts of speech is typically many-to-many.” (Anward 2000)

Current approaches 2:

- *Functionalists*: Dik 1989, Hengeveld 1992
- Classification according to head and/or modifier of predicate phrase or referential phrase:
→ **N, V, Adj, Adv**
- *Non-discreteness hypotheses* (Sasse 1993, 2001)
- Word-classes are squishy, have fuzzy edges, are overlapping, etc.
- Arguments from equivocal use of N & V in Samoan, or identity of possessive (N) and subject-agreement (V) paradigms in Hungarian.

Current approaches 3:

- *Cognitivist* (Evans & Green 2006):
- Nouns often refer to entities, including people, and abstractions (like *war* and *peace*).
- Nouns typically take the inflectional plural affix -s (*cats, dogs, houses*) but there are exceptions (**mans, *peaces*).
- Nouns also typically take the possessive affix -'s (*man's best friend*), and in terms of distribution, follow determiners like *your* and adjectives like *funny* (*your funny face*).
- Nouns can be divided into two main subclasses: common nouns and proper nouns.

Current approaches 4:

- *Generative* (Aarts & Haegeman 2006)
- “Word classes can be viewed as abstractions over sets of words displaying some common property or properties.”
- „define word-classes in terms of their morphosyntactic properties, i.e., by using inflectional and distributional properties”

Independent evidence for word-classes from psycho- and neurolinguistics 1:

- a) Speech errors: word-class retention, from Fromkin (1971) onward, e.g.:
a laboratory in our own computer ←
a computer in our own laboratory
what are you incinerating? ← *insinuating*
the police liquidized him ← *liquidated*
- b) Broca aphasia: preserving word-classes (Grodzinsky 1990)

Independent evidence for word-classes from psycho- and neurolinguistics 2:

- c) Difference between processing open and closed class items (Biassou et al. 1997)
- “In contrast to the results of the normal subjects, the agrammatic Broca's aphasics demonstrate quite a different pattern of reaction time results. Whereas the normal subjects display no word class effect, the aphasics demonstrate a major effect for word class during sentence processing [...]. Thus, open class words are consistently responded to more rapidly than closed class words for these subjects.” (Swinney et al. 1980)
- d) Word-classes distinct in mental processes, shown by PET, fMRI, and ERP (= Event Related Potential): Nouns show larger negativity effects than Verbs. (Lee & Federmeier 2006)

Traditional word class definitions:

- centered around prototypical properties
- → hierarchy of features, fuzzy edges.
- central properties determine syntactic information = paradigmatic characteristics
- Word class clines result from one-dimensional representations,
- similar to clines in inflection vs. derivation:



Suppose we do have word-classes with sharp edges:

- Then: what's a word-class? – A set defined by the properties used as criteria.
- Then what does it mean to belong to some word-class?
- Answer: To have those very properties or to be characterized by them.
- **But this is circular.**
- As soon as some word has a property derivative from its class membership, that very property will automatically serve as a criterion to define the word-class in question →
- **The circle is never broken.**

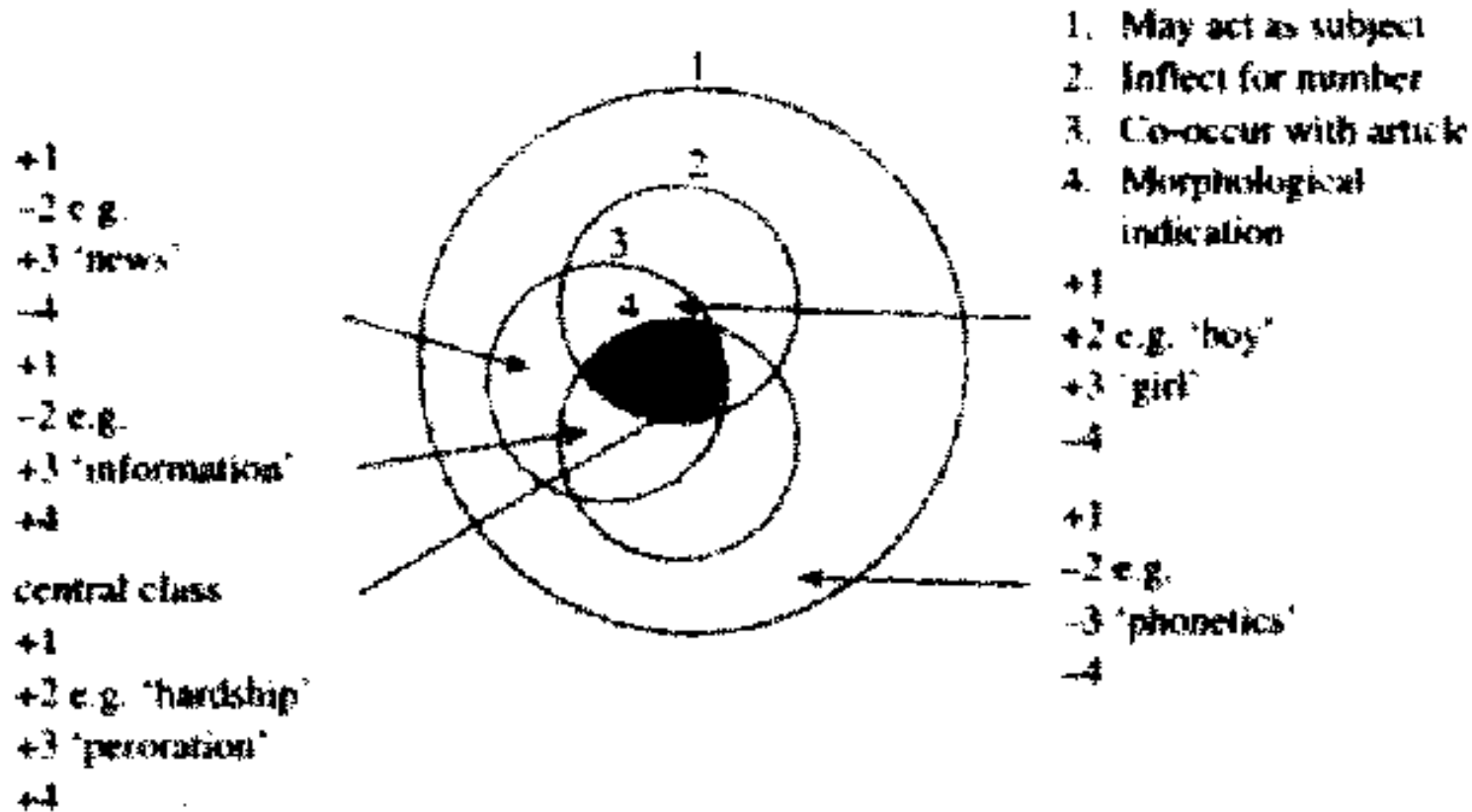
New proposal:

- Turn definitions upside down:
- Regard word-class criteria as information encoded in the word (morpheme, minimal lexical item, “listeme”, etc.)
- what is the nature of the information?
- anything that is relevant to what the item can cooccur with
- → morphology (affixes: derivational, inflectional, etc.),
- → syntax (transitive, prepositional, complex transitive, etc. verbs; attributive/predicative adjective; intensifiers, various adverbials, etc.,
- → semantics (collocations, semantic constraints on derivational affixation, etc.)

New proposal (ctd.)

- Result: as many ‘classes’ as there are features – yes, Robins and Crystal again
- But: no longer circular, because these are features relevant at another/different level: syntax, affixation, etc.
- What we have called word-classes are but **instructions for the item as to what to combine with**
- Classical word-classes are (equivalent to) sets or clusters of formal syntactic features
- Replace one-dimensional ‘word-classes’ with multidimensional approach via features.

Change to multidimensional analysis via features and you get something like Crystal's (1967) intersecting sets.



Multidimensions in computational linguistics, cf. Maurice Gross' (1985) feature matrix and →

MGross_LexGram 1985.pdf - Adobe Reader

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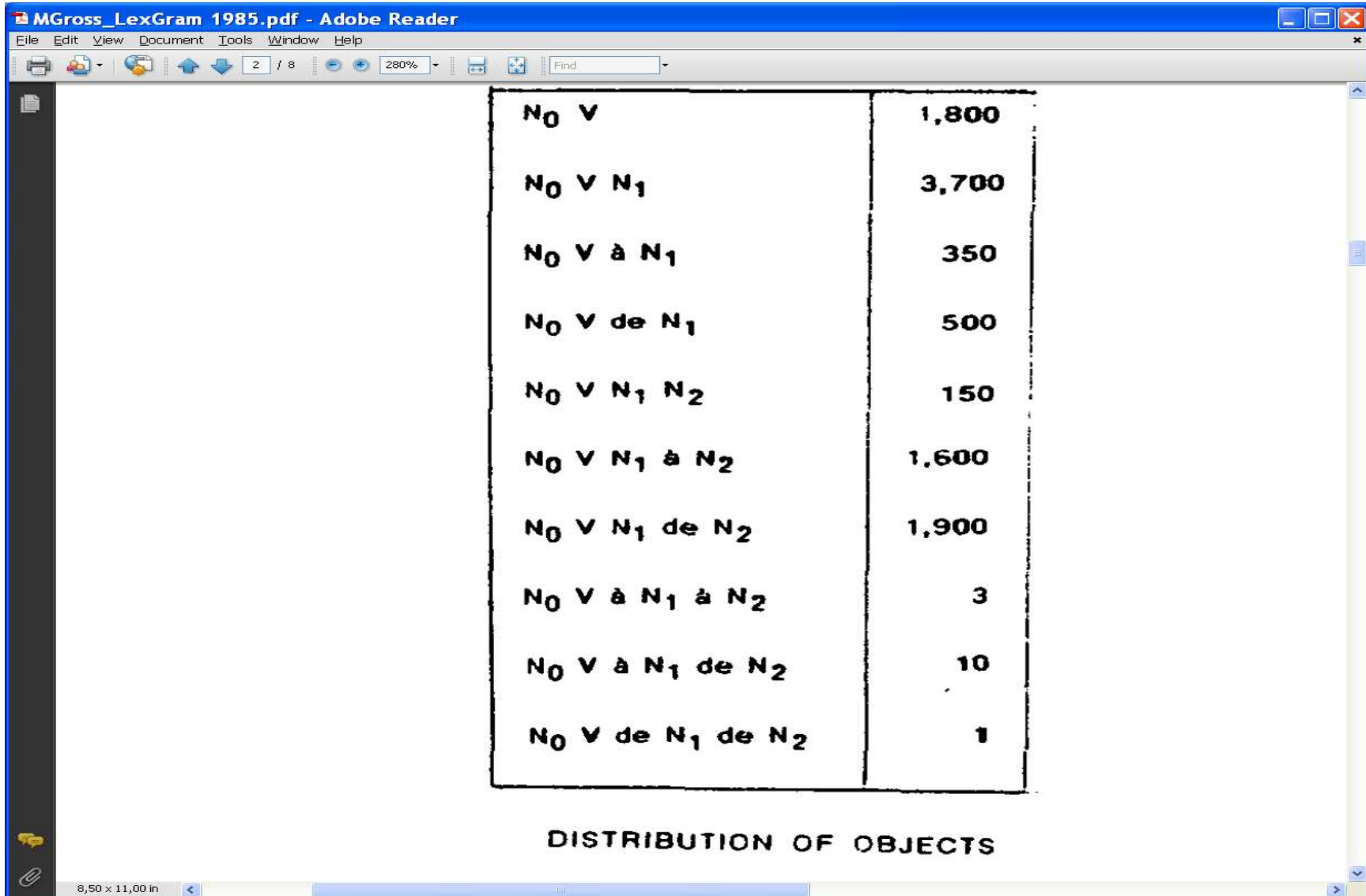
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Intransitive Verbs (From Boons, Guillet, Leclère 1976a)

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Gross's subcategorized verb classes (N = 10k)



The image shows a screenshot of an Adobe Reader window displaying a PDF document titled "MGross_LexGram 1985.pdf". The document content is a table with two columns: the first column lists various verb classes using N (Noun) and V (Verb) symbols, and the second column lists the corresponding frequency for each class. The table is enclosed in a hand-drawn rectangular border. Below the table, the text "DISTRIBUTION OF OBJECTS" is centered. The Adobe Reader interface includes a menu bar (File, Edit, View, Document, Tools, Window, Help), a toolbar with icons for printing, zooming, and navigation, and a status bar at the bottom showing the page size as 8,50 x 11,00 in.

N₀ V	1,800
N₀ V N₁	3,700
N₀ V à N₁	350
N₀ V de N₁	500
N₀ V N₁ N₂	150
N₀ V N₁ à N₂	1,600
N₀ V N₁ de N₂	1,900
N₀ V à N₁ à N₂	3
N₀ V à N₁ de N₂	10
N₀ V de N₁ de N₂	1

DISTRIBUTION OF OBJECTS

Open vs. Closed

- But: some features/classes are more equal than others:
- Some extend over more items/have more members.
- More than that: some classes can have new members, others cannot
- → An age-old finding: the distinctions between open and closed classes
- But – with a difference:
- The ‘usual’ closed classes are rarely ever classes:
- seldom, if ever, are there two elements with identical distributions, i.e. feature combination.

Open vs. Closed: Examples

- If **Aux** is defined as a (subclass of) verb with no thematic role discharged → 3 Aux's in Hung.:
fog 'will'; *szokott* 'usually does'; *talál* 'happens to'
But: each has different complementation, affixation, etc., properties.
- **Articles**: *the, a/an, some, ZERO (?)* – different distribution by definition.
In fact, it is the 'articles' own edge features that determine their complementation
- **Pronouns** are notorious for being a 'non-class' – but it's convenient: related to one another by common properties of being referential by deixis or member of a paradigm, etc.

Closed classes = metalinguistic shorthand

- a) calling attention to differences in pragmatic (reference, etc.), usage (deference, etc.), or functional aspects (in case of, e.g., ‘conjunctions’)
- b) simplifying lexicographers’ work by grouping queer, anomalous, or out of the ordinary lexical items in the same basket – on grounds of considerations in (a)
- c) letting outsiders think that grammar is ‘orderly’: making statements about classes of words, not just individual items.

Open classes

- new members always possible → some combination of fundamental, central, 'prototypical' properties always available for loanwords, acronyms, regular compounding and derivation
- some features are more general, extend to more items than others, e.g.,
Crystal's and Gross's feature of 'can function as a subject – with/out an article'

Affixes

- No need to worry about derivation *versus* inflection:
again determined by (sets of) properties
- Cf. Hungarian ‘syntactic derivation’ – some comparable to English ‘–ed compounds’,
e.g.,
curly-haired, very light skinned

- Prenominal attributive phrases derived from

- a) NP:

a [[[nagyon hosszú] haj]-ú] diák

the very long hair-**AFX** student

‘the student having very long hair’

- b) PostpositionalP:

a [[Péter felett]-i] diák

the Peter above-**AFX** student

‘the student above Peter’

Feature matrix for affixes: illustration from Mártonfi 2006:

MártonfiA_PhDdissz.pdf - Adobe Reader

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
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<i>-int</i>	-	0	-	-	-	-	-	-	-	+	-	-	-	+	+	-	-	-	-	-	+	+
<i>-ért</i>	+	+	0	+	+	+	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	+
<i>-Aszt</i>	+	-	0	-	-	-	-	-	-	+	-	-	-	+	+	-	-	-	-	-	-	+
<i>-u</i>	-	+	+	-	-	-	-	0	-	+	-	+	+	+	+	-	+	-	-	-	-	+
<i>-(j)Ú</i>	+	-	+	0	-	-	+	+	-	+	-	-	-	+	+	-	+	+	-	-	-	+
<i>-(An)tyÚ/-AttyÚ</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+
<i>-(V(d))z[ik]</i>	-	-	-	-	-	-	-	+	-	+	-	-	-	+	-	-	-	-	-	-	-	+
<i>-Ó(d)z[ik]</i>	-	+	-	-	-	-	-	-	-	-	-	-	+	+	+	-	+	-	-	-	-	+
<i>-(A)dOz[ik]</i>	-	+	-	-	-	-	-	-	-	+	-	-	+	+	+	-	+	-	-	-	-	+
<i>-hOz</i>	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	+
<i>-(A)kOz/-kÓz[ik]</i>	+	-	-	-	-	-	-	+	-	+	-	-	-	+	+	-	-	-	-	-	-	+
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Advantages:

- no more worry about number and composition of classes,
- prototypical *versus* peripheral members,
- clines and fuzzy edges, etc.,
- AND: no circular definitions

Disadvantages:

- the age-old frame of reference will be seen as a convenient labeling device for use in language education, lexicography, etc., - but without any theoretical support.

Conclusions 1:

- Let's shed our word-class blinkers,
- Put on your syntactic or morphological field-glasses and you'll see **there are no word-classes, only features**
- Much like in case of phonemes vs. features – cf. ancient atoms (Siptár 2006)
- Word-classes are **not** universals, though features (and their combinations) may well be
- Places the issue of word-classes into the proper context:
- Use of information on 'word-classes' – in morphology, syntax, semantics.

Conclusions 2:

- Syntactic & (productive) morphological processes operate on features, not words or morphemes;
- Whether syntax applies ‘full lexical item insertion’ and thus projects syntactic structure from the lexicon (classical P&P model) –
- or is based on the “late insertion” model, in which vocabulary items play no role in the syntax proper, as in Distributed Morphology and thus the Minimalist Program,
- the conclusion is the same:
- **word-class is an epiphenomenon.**

Thank you

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