Derivation

- Basic derivational operations

  A taxonomy of typical lexeme-formation operations

- Productivity

  What does it mean to be a productive word-formation operation?

  How does one calculate productivity?

- Order of affixes

  Are there tendencies for affixes with certain meanings to be ordered relative to one another?

3 main types of morphological relations

- Inflection, derivation, and compounding
  - Inflectional morphology modifies properties of LEXEMES, while maintaining the basic meaning of the LEXEME.

mor-iksel'-i-ń	mor-iksel'-i-ť
sing-DES-PAST-1SG	sing-DES-PAST-2SG
`I wanted to sing'	`you wanted to sing'

(Erzya Mordvin)

3 main types of morphological relations

- Inflection, derivation, and compounding
  - Derivation relates lexemes in a word family

    eŕa-ms$_V$ ⇒ eŕa-ma$_N$
    live-INF live-NR = `life' (Erzya Mordvin)

  - Compounding combines LEXEMES

    repül-ő-gép-gyart-ás (Hungarian)
    fly-er-machine-produce-NR
    `airplane production'

3 main types of morphological relations

- Derivation relates LEXEMEs in a word family

  eŕa-ms$_V$ ⇒ eŕa-ma$_N$
  live-INF live-NR = `life' (Erzya Mordvin)

- Compounding combines LEXEMEs to create a new LEXEME

  repül-ő-gép-gyart-ás (Hungarian)
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  `airplane production'

Prototypical differences between inflection and derivation

	Derivation	Inflection
1.	Encodes lexical meaning	Encodes grammatical meaning
2.	Not syntactically relevant	Syntactically relevant
3.	Occurs close to the root & inside other derivation	Occurs outside all derivation
4.	Often changes lexical category	Does not change lexical category
5.	Often semantically opaque	Usually semantically obvious
6.	Often shows restricted productivity	Fully productive
7.	Optional	Obligatory

Basic derivational (lexme-formation) operations

- Permits the expansion of the lexicon of a language

Category-maintaining operations:

V ⇒ V_{CAUS}:	olvas	`read'	⇒	olvas-tat	`make read'
	legel	`graze'	⇒	legel-tet	`make graze'
V ⇒ N:	énekel	`sing'	⇒	énekl-ő	`a singer'
	sír	`weep'	⇒	sír-ó	`a weeper'
N/V ⇒ A:	felhő	`cloud'	⇒	felhő-tlen	`cloudless'
	mos	`wash'	⇒	mos-atlan	`unwashed'

Basic derivational (lexme-formation) operations

- Permits the expansion of the lexicon of a language

Category-changing operations:

A ⇒ Adv:	meleg	`warm'	⇒	meleg-en	`warmly'
	csunya	`ugly'	⇒	csunyá-n	`in an ugly way'
V ⇒ N:	énekel	`sing'	⇒	énekl-ő	`a singer'
	sír	`weep'	⇒	sír-ó	`a weeper'
N/V ⇒ A:	felhő	`cloud'	⇒	felhő-tlen	`cloudless'
	mos	`wash'	⇒	mos-atlan	`unwashed'
A ⇒ V	szép	`beautiful	⇒	szép-ül	`become beautiful'

External organization: words as participants in networks of relations

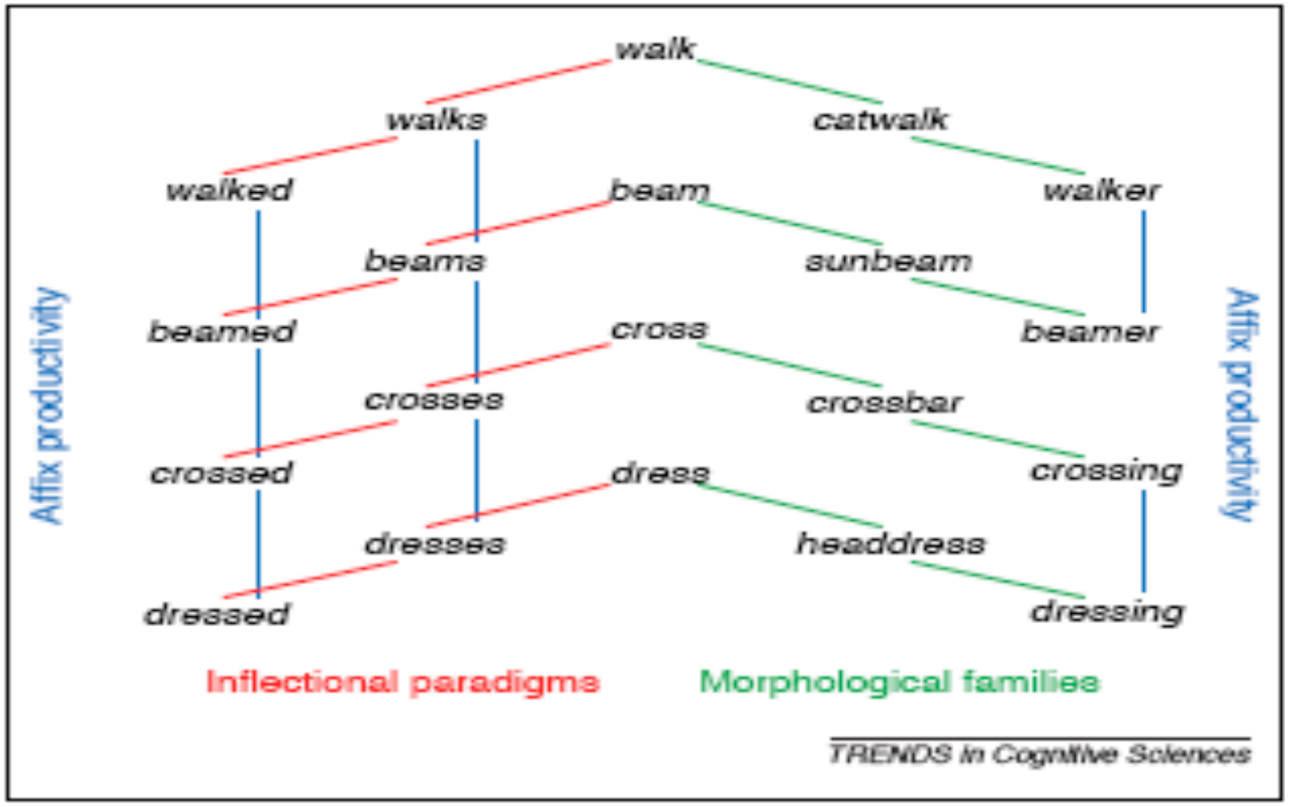

Figure 1. Examples of paradigmatic lexical relations in English. Relations between inflected variants (inflectional paradigms) are shown in red, relations between morphologically related compounds and derived words (morphological families) are shown in green, and relations between words sharing the same affix are shown in blue. Affixes that occur across many words are described as productive.

-th affixation

broad + th ⇒ breadth

deep + th ⇒ depth

long + th ⇒ length

strong + th ⇒ strengh

true + th ⇒ truth

warm + th ⇒ warmth

wide + th ⇒ width

phonology: X-/θ/, with various different base alternations

category of based: X = adjective

semantics: `state or property of being X'

What's the structure?

unactualizability

Derivation

- Basic derivational operations

  A taxonomy of typical lexeme-formation operations

- Productivity

  What does it mean to be a productive word-formation operation?

  How does one calculate productivity?

- Order of affixes

  Are there tendencies for affixes with certain meanings to be ordered relative to one another?

What's going on here?

- For some words, we can predict that -ity won't apply

glorious	*gloriosity	gloriousness
furious	*furiosity	furiousness
gracious	*graciosity	graciousness
fallacious	*fallaciousity	fallaciousness
acrimonious	*acrimoniosity	acrimoniousness

-able affixation

abominable
absorbable
abstractable
abusable
acceptable
accountable
accruable
achievable
acid-extactable
actable
actionable
actualizable
adaptable
addressable
adjustable
admirable
admissable
adorable
advisable
affable

Productivity

"Property of a morphological process: a process is productive if it can be applied to new (forms of) words." [Booij in glossary]

"The statistical readiness with which an element enters into new combinations (Bolinger 1948:18)

- Productivity isn't really an all-or-nothing concept

Productivity

- Some observations
  - Though many things are possible in morphology, some things are more likely than others (cf. walked and ran)
  - Though there are infinitely many potential words in a language, some are more likely to become actual words than others (cf. mini-burger, burgerlet, burgerette)
  - We need to consider actual words and potential words and what the relation is between them.

-th affixation

broad + th ⇒ breadth

deep + th ⇒ depth

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true + th ⇒ truth

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wide + th ⇒ width

phonology: X-/θ/, with various different base alternations

category of base: X = adjective

semantics: `state or property of being X'

Productivity

- So, the suffix -th is generally considered unproductive
- But, WWW searches turn up many citations:

> Coolth, once a nonce word made up on analogy with warmth, is now tiresomely jocular. (1923)
>
> Increase the capacity of your house to store coolth. (Yes, it is a real word.) Using the mass in your house...
>
> The team developed a strategy to capture night-time coolth and store it for release during the following day.
>
> Do we see the whiteness of the snow, but only believe in its coolth.

Productivity

- The suffix -th was once productive:
  - filth, health, length, mirth, strength, truth, dearth, depth, breadth, sloth, wealth
- Coolth (coined after warmth) goes back at least to 1547
- Width [wɪdθ] comes from widness (influenced by length) in 1627, not wide [waid]
- Later coinages: illth (opposite of wealth = well-being), greenth, loweth

And, what's going on here?

approve	approval	approbation
recite	recital	recitation
propose	proposal	proposition
arrive	arrival	* arrivation
refuse	refusal	* refusation
derive	* derival	derivation
describe	* describal	description

How can we describe constraints on the use of specific derivational operations?
Alternatively, how can account for degrees of productivity?

Productivity

- Words in -ness have three meanings
  - 'the fact that Y is X' — His callousness surprised me.
  - 'the extent to which Y is X' — His callousness surprised me.
  - 'the quality or state of being X' — Callousness is not a virtue.
- Words in -ity can have many specialized meanings

  The are several varieties of fish in the lake.
  They admired his dress, but only as a curiosity.

Blocking

- For some words, we can predict that -ity won't apply

glorious	*gloriosity	gloriousness
furious	*furiosity	furiousness
gracious	*graciosity	graciousness
fallacious	*fallaciousity	fallaciousness
acrimonious	*acrimoniosity	acrimoniousness

- The existence of a noun (glory, fury, ...) blocks the formation of a synonym
- Panini's Principle (aka Elsewhere Condition): A more specific rule trumps a more general rule

Blocking

- Let's assume that the operation that forms nouns with -ity is more restricted (applies to fewer stems with more conditions on its application) than the operation that creates nouns with -ness, thus, formation with -ity is more specific than formation with -ness

  glory blocks gloriousity and if glorioiusness is formed, then it doesn't mean was glory means.

  electricity blocks electricness

- Completely predictable forms aren't listed in the dictionary, so aren't subject to blocking effects; this makes claims about what we store in our mental lexicons and how "rules" interact with stored items.

- Blocking seems general (*this night / tonight), and somewhat mysterious

Storage and Rules: The role of history

- The impulse toward generative rules, i.e. operations that produce complex forms from smaller pieces, thus limiting storage:

  "The computers of that era (1950s) had comparatively reasonable computational capacity but very limited memory. For a program to work efficiently, it had to minimize storage...Linguistic data in electronic form did not exist. Not surprisingly, the linguistic theories of the time took formal languages as models, emphasizing the generative capacity of language, denying any role of importance to probability and statistics, elevating economy of storage in memory to a central theorem." (Baayen 2003:230)

Disparagement of Frequency

- Generative grammarians distinguish between I(-nternal) Language and E(xternal)-language, where the former is our mental representation of grammar and of theoretical interest, but the latter is just how this grammar is used in real time.
- Frequency considered to be part of performance/E-language and, hence, not of primary theoretical interest:
  - "It seems that probabilistic considerations have nothing to do with grammar, e.g. surely it is not a matter of concern for the grammar of English that 'New York' is more probable than 'Nevada' in the context 'I come from–'." (Chomsky 1962)
  - "But it must be recognized that the notion 'probability of a sentence' is an entirely useless one, under any known interpretation of this term." (Chomsky 1969)

Storage versus Rules

- What do people store in their mental lexicons?

  Hypothesis 1: Just the irregular formations, since listed elements and rules can give you the regular ones. (elegant, since non-redundant)

  Since spell-able is producible by the application of a productive -able affixation rule, it is not stored in the lexicon.

- It would be redundant to store both the complex word and the rule that could generate it.
- Thus, it is both elegant and economical to just store each of necessary and irreducible pieces just once.
- The only elements that must be stored are those cannot be generated by rule.

Word formation rules (WFRs): IP

- The bases of WFRs are themselves words, i.e. words are built from words, i.e. lexeme-formation operations.
  - Bases must be existing words; a possible but non-existent word (according to the hypothesis) cannot be the base of WFR, since only underived words are in the lexicon.
  - WFRs can take as a base only a single word, no more (e.g., phrases) and no less (e.g., morphs)
  - Both the input and the output of WFRs must be members of a major lexical category (noun, verb, adjective, preposition)

Storage versus Rules

- Let's say that the goal of morphology is create a lexicon that it is as non-redundant as possible
- It contains all of the morphemes of the language, i.,e, lexical representations for roots and affixes:

  store$_V$ <SUBJ, OBJ> `put way in order to have for a future date'

  able$_N$ `such that X can be V-ed'
- An -able word-formation rule:

  phonology: X/əbl/

  semantics: `X can be V-d'

  base: X = V(erb)

WFRs

- Speakers seem to be aware of WFRs:
- a WFR of English produces adjectives from verbs:

  phonology: X-/əbl/

  category of base: X = $V_{transitive}$

  semantics: `capable of being V-ed'

  spellable, traceable, singable, imaginable

- But, what about:

  workable solution, makeable mistake, perceptible error, saleable items, remarkable tenacity...

Word formation rules

- We also have words with similar form and meaning that are not formed by WFR

  possible, tangible, legible, edible (versus eatable) unflappable

- Given the rule, should speakers posit meanings and lexical categories for poss- and tang- and -unflap might be, though they aren't listed anywhere.

- Indeed, sometime WFRs can be used to motivate new formations.

Word formation rules

- WFRs can also explain back-formations
- The word babysitter is formed by the rule:

  $[X_N Y_N]_N$ 'an Y-er of X'

  like anteater and cardholder
- But, it superficially has the form of a word produced by the rule:

  $[X_V$ -er$]_N$ 'one who Xs habitually, professionally, etc.'
- If one assumes that -er in babysitter is the agentive affix, the stripping it off will yield babysit, a coinage that is motivated, but not predicted

Storage versus Rules

- Is there any reason to believe that human minds reflect the scientific goals of parsimony and non-redundancy?
- Is the standard IA and IP organization of morphology, in terms of minimizing storage and optimizing rules, simply a reflection of the historical fact that methods and metaphors for the analysis of morphology were developed at a time that favored and encouraged certain assumptions and tools and disfavored others?

Storage versus Rules

- What do people store in their mental lexicons?

  Hypothesis 2: Both the regular and the "irregular" ones, though patterns/rules also exist. (less elegant, since redundant)

  Though spell-able is producible by the application of a productive -able affixation rule, if frequent enough, it may still be stored in the lexicon.

- Though this is redundant, it may be psychologically accurate and, so, theories should reflect the storage of complex words.

- Do human minds reflect the scientific goals of parsimony and non-redundancy?

Interim summary

- There are regularities evident in lexeme-formation, i.e. the derived form is simply a product of the information in the rule that produces it.
- There are differences in productivity with respect lexeme-formation operations
- Some operations compete with one another, partitioning domains of lexeme-formation (-ity v. -ness as both deriving nouns)
- Some operations seem to apply straightforwardly and regularly (spellable), while others apply less straightforwardly and regularly (saleable).

Interim summary

- The task is to identify the nature of productivity and regularity and to understand what the consequences of this investigation are for the design of our morphological theories and for assumptions about the mental lexicon.
- To explore productivity, we have to examine frequency more carefully.

Frequency

(following discussion based on Plag 2003)

- Frequency effects are very important in morphology, perhaps more than any other subfield of linguistics
- What is frequency?
  - Absolute and relative frequency
  - Type and token frequency
  - Word, stem, and morph frequency
- Speakers are very aware of relative word frequencies
- More frequent items are (generally) processed faster
- What is linguistic theory supposed to reflect?

Productivity and frequency

- If productivity is a gradient concept, how can we define or measure it?
- Absolute type frequency
  - There are 3,604 words ending in -able in Webster's 2nd
  - Some, though, are French loans: acceptable, changeable, desireable
  - Some might be French loans: payable, regrettable
  - Calques: understandable

-able derivatives in the British National Corpus: Types and Tokens

	Frequency		Frequency
abominable	84	actionable	87
absorbable	1	actualizable	1
abstractable	2	adaptable	230
abusable	1	addressable	12
acceptable	3416	adjustable	369
accountable	611	admirable	468
accruable	1	admissable	2
achievable	176	adorable	66
acid-extactable	1	advisable	516
actable	1	affable	111

Measuring productivity in types

- Given access to historical data (dictionaries, corpora), we can compare the rate of additions licensed by word formation rules
- Many words with a particular affix, e.g. government, may reflect the former productivity of the affix in creating neologisms, i.e., at some time the affix may have been productive.
- Many dictionaries do not list the most productive affixes, i.e., smartness, so this type may be under-represented precisely because it is synchronically productive.
  - Dictionaries don't always list new words
  - Dictionaries don't always list fully predictable words

Measuring productivity

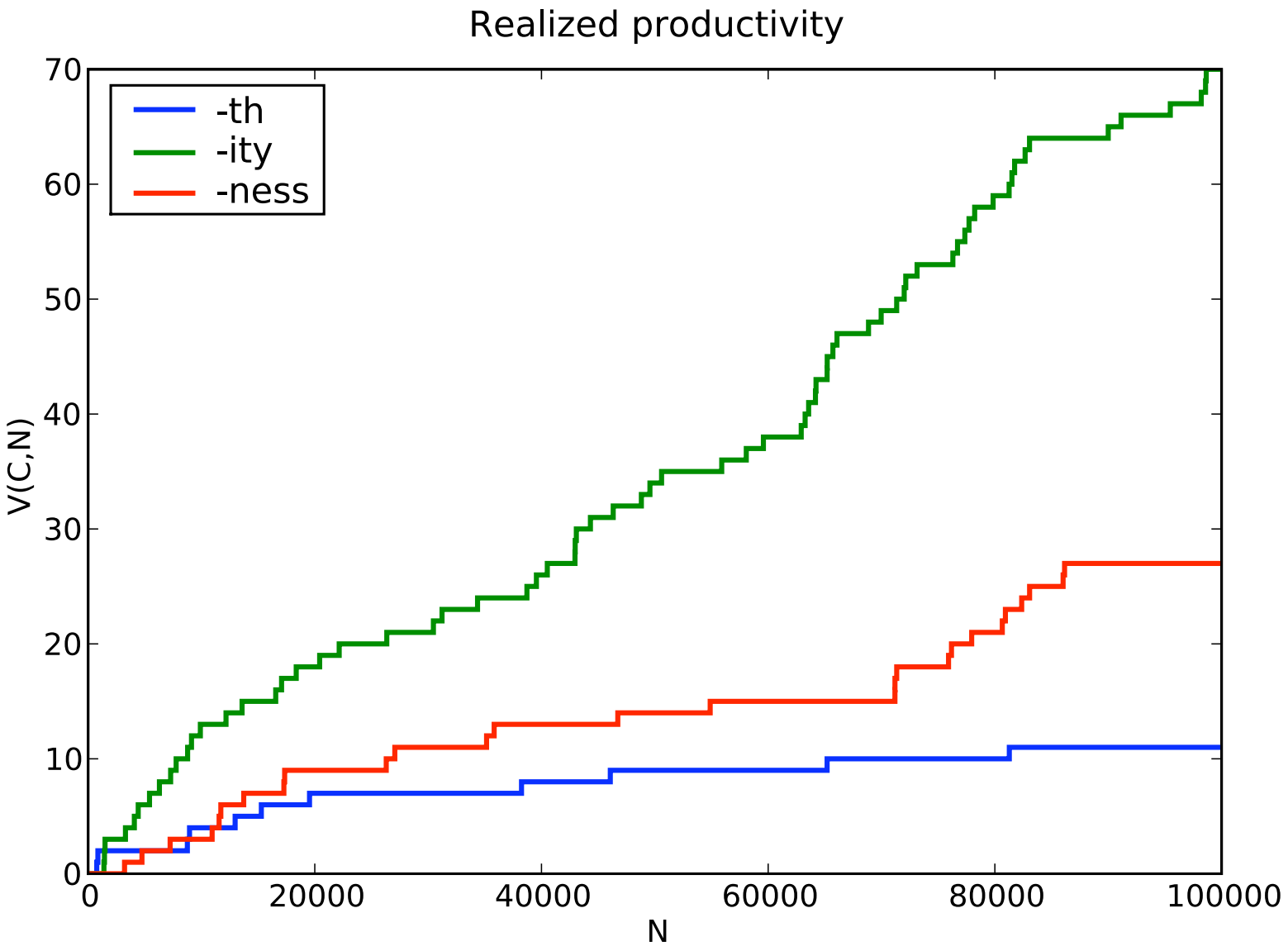
- We could look at the ratio of actual to possible words to get an index of productivity (Aronoff 1976, Baayen and Lieber 1991)

$$I = \frac{V}{S}$$

- This depends on being able to identify S, the number of words which a WFR ought to apply to (infinity?)
- And, we need to identify V, the number of words which it does apply to.
- Even if we can get past this, at best we get an index of past productivity, not current productivity

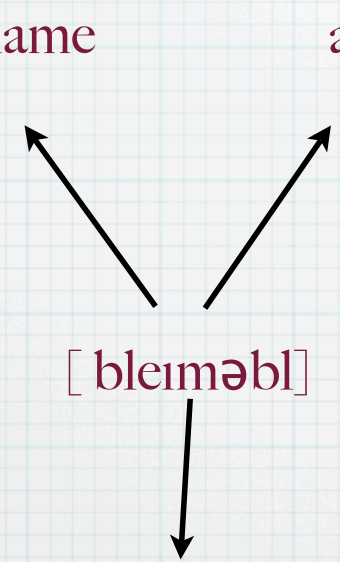
Measuring productivity

- Realized productivity is the success of a morphological pattern in the linguistic marketplace (cf. market share)
- It can be estimated by V(C,N), the number of word types following pattern C in a corpus of N tokens
- Brown corpus
  - 49,815 types, 1,161,192 tokens
  - 402 types in -ity
  - 322 types in -ness
  - 38 types in -th


Realized productivity
-th
-ity
-ness
V(C,N)
N
0
10
20
30
40
50
60
70
0
20000
40000
60000
80000
100000

Token frequency and the mental lexicon

Dual Route Model (Baayen): each word processed in 2 ways



Decomposition route

(economical wrt storage, costly wrt processing)

Whole word route

(costly wrt storage, economical wrt processing)

Frequency

- Words that occur more frequently are more easily stored and accessed than less frequent words.
- Higher frequency words have a higher resting activation than lower frequency words: it is this that makes them more accessible more quickly.
- All words are amenable to analysis in terms of the decomposition route and the whole word route, with the choice of which route applying in each case being determined by the level of resting activation.
- The storage of complex, highly frequent words (high resting levels) renders them more amenable to the whole word route.
- The low frequency words are decomposed, since there is no whole word.

Frequency

- The decomposition of low frequency words leads to the greater accessibility of affixes and, consequently, these affixes are more accessible for creation of neologisms (new derivatives).
- If only high frequency words enter into the system, then these are accessed as whole words and their internal composition, i.e. affixes, are less accessible for the neologisms.
- Unproductive morphological categories associated with many high frequency words and few low frequency ones, while
- correlatively, productive morphological categories associated with many low frequency words and few high frequency ones.

Measuring productivity via tokens

- Words with the lowest frequency are those which appear only once: these are hapax legomena or hapaxes
- They are likely to be coinages, made up on an ad hoc basis and they can be used to quantify productivity.

-able derivative in BNC and Webster's 3rd

3 of 6 hapaxes not listed; 3 other low frequency words not listed in Webster 3rd

-able derivative	token frequency	listed in Wrd
absorbable	1	yes
abusable	1	no
accruable	1	no
acid-extractable	1	no
actable	1	yes
abstractable	2	no
admissible	2	no
addressable	12	no
adorable	66	yes
abominable	84	yes
actionable	87	yes
affable	111	yes
achievable	176	yes
adaptable	230	yes
adjustable	369	yes
admirable	468	yes
accountable	611	yes
acceptable	3416	yes

First twenty word alphabetically in BNC:

13 of 20 hapaxes not listed in Webster 3rd

BNC hapaxes and their entries in *Webster's Third*

-able derivative	Listed in *Webster's Third*	*-able* derivative	Listed in *Webster's Third*
absorbable	yes	amusable	no
abusable	no	annotatable	no
accruable	no	applaudable	yes
acid-extractable	no	approvable	no
actable	yes	arrangeable	no
actualizable	yes	assessionable	yes
affirmable	yes	auctionable	no
again-fashionable	no	biteable	yes
aidable	no	blackmailable	no
air-droppable	no	blameable	no

Calculating productivity?

- To find the probability of finding a likely neologism in a corpus, one calculates the ratio of the number of hapaxes with the specified affix to all of the tokens containing that affix.
- The formula is: $P = n_1^{aff}/N^{aff}$
- That is, if there are 2 hapaxes with a specific affix and 100 tokens with that affix, the probability of encountering a new word is 2 percent.
- Thus, a higher number of hapaxes yields a higher value for P and, hence, a higher degree of productivity associated with the affix.
- In contrast, a high number of high frequency items leads to a lower value for P and, consequently, a lower productivity associated with the affix.

Calculating productivity

(Plag et. al. 1999, Plag 2003)

Frequencies of affixes in the BNC (written corpus)

Affix	V	N	n_1	*P*
-able	933	140627	311	0.0022
-ful 'measure'	136	2615	60	0.023
-ful 'property'	154	77316	22	0.00028
-ize	658	100496	212	0.0021
-ness	2466	106957	943	0.0088
-wise	183	2091	128	0.061

V = type frequency/'extent of use',
N = token frequency, n_1 = hapax frequency,
$P = n_1/N$ 'productivity in the narrow sense'

- Some forms have large number of types (V): -ness
- Some forms have large number of tokens (N): -ize
- Some forms have relatively small number of hapaxes:

  -ful `measure': tankful, truckful,...

  -ful `property': peaceful, mindful...

Calculating productivity

(Plag et. al. 1999, Plag 2003)

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V = type frequency/'extent of use',
N = token frequency, n_1 = hapax frequency,
$P = n_1/N$ 'productivity in the narrow sense'

- `measure' -ful and `property' -ful have similar type (V) frequencies
- they have very different token frequencies
- they have very different hapax frequencies
- the relation of hapaxes to tokens (0.023 `measure' v. 0.00028 `property' suggests that `measure' -ful is the productive one.

Calculating productivity?

Frequencies of the most frequent adjectival *-ful* derivatives (BNC, written corpus)

derivative	frequency
successful	10366
useful	9479
beautiful	7964
powerful	7064
careful	4546
wonderful	4202

- That `measure' -ful is the productive one is further corroborated by closer examination of tokens and types for `property' -ful:

  the high frequency of a small number of types accounts for the high number of tokens (N)

- This is expected given that if a morphological category (an affixal pattern) contains a large concentration of highly frequent words, it tends to be less productive (whole-word route)

- In contrast, patterns with fewer highly frequent words and more low frequency words are generally productive (decomposition route)

Looking at a different type of frequency: affix ordering

- Some basic questions

  1. Do affixes contributing derivational and inflectional inflectional information exhibit reliable sequencings relative to the lexical root and to each other?

- 2. If there do seem to be such orders are they categorical or tendential?

  3. What might be the causes of such orderings, if they exist?

  4. Since investigating orderings presupposes the existence of morpheme-like entities, how do approaches that don't depend on morphemes deal with such data? (Conversely, are there generalizations that can be made for complex words that aren't analyzable in terms of pieces with identifiable meanings?)

Morphological universals

(J. Greenberg 1963)

***Universal 28*.** If both the derivation and inflection follow the root, or they both precede the root, the derivation is always between the root and the inflection.

***Universal 29*.** If a language has inflection, it always has derivation.

***Universal 30*.** If the verb has categories of person-number or if it has categories of gender, it always has tense-mode categories.

Universal 32. Whenever the verb agrees with a nominal subject or nominal object in gender, it also agrees in number.

***Universal 39*.** Where morphemes of both number and case are present and both follow or both precede the noun base, the expression of number almost always comes between the noun base and the expression of case.

Form and content mappings

(adapted from J. Bybee 1985)

- Form

  free element - clitic - prefix - root - suffix - clitic - free element

  Degrees of fusion (synthesis or periphrasis)

- Content: Are contents associated with forms, i.e., derivation, inflection (inherent and contextual) reliably associated with sequences of formal elements that express them?

- Hakha Lai (Tibeto - Burmen: Myanmar - Bickel & Nichols WALS)

  a- nii làay

  3SG-laugh FUT

  `s/he will laugh'

- Consists of 2 independent phonological words, but construable as synthetic, though not fusional.

Hypothesis for attested regularities in ordering

(J. Bybee 1985:13)

- Relevance:

  "A meaning is relevant to to another meaning if the semantic content of the first directly affects or modifies the semantic content of the second."

  For lexeme-formation: walk ` a way of moving on legs'

  wade ` walking through water'

  but no - wamp `walk on cloudy thursdays'

- `through water' is relevant, but `on cloudy thursdays' is not, so there can be a word for the former, but not for the latter.
- the word with the meaning component `through water' yields a new root, i.e., relevance in lexical meaning is (often) reflected in complete change of root, which is the ultimate in synthetic expression.

Hypothesis for attested regularities in ordering

(Bickel & Nichols in WALS)

- Lango (Nilotic - Sudan)

  ɛ̂n òcámò
  s/he 3SG.eat.PFV.CONSTRUCT
  `he ate it'

  òcàmò
  3SG.eat.PFV
  `he ate it'

Hypothesis for attested regularities in ordering

(J. Bybee 1985:13)

- Recall Sapir's distinction between material (radical) and relational content:

  material expressed by independent words and roots

  relational content expressed by modification of root or affixes - note that not all imaginable meanings show up as relational content. Why do such meanings tend to recur cross-linguistically and constitute a rather small set of basic distinctions?

- Relevance again: (Bybee 1985:15)

  "... we can distinguish degrees of relevance of the concept expressed inflectionally to the concept expressed by a radical element, in this case a verb stem. A category is relevant to the verb to the extent that the meaning of the category directly affects the lexical content of the verb stem.

Relevance Hypothesis on affix ordering

(J. Bybee 1985)

- Hungarian

néz-	eg-	ett-	em
look-	frequentative	past	1sg
ROOT	ASPECT	TENSE	AGREEMENT

`I looked and looked'

- Aspect modifies properties of the basic meaning associated with the root, so that it has an effect on lexical semantics, i.e., olvas-gat `browse, read superficially' from olvas `read'.

Predictions

(J. Bybee 1985)

1. It should be common to find lexical expression of aspectual distinctions, but not lexical expression of agreement:

know v. realize; do v. complete

but compare e.g., am, is, are, which if systematic, rather than suppletive would be instances of agreement finding lexical expression.

- Why aspect and not agreement?

2. Expectation that aspect, because it more intimately affects the root, will be more common than agreement for person:

***Universal 30*.** If the verb has categories of person-number or if it has categories of gender, it always has tense-mode categories.

Predictions

(J. Bybee 1985)

"...semantic elements that are highly relevant to one another are likely to be packaged together and expressed lexcially, or will be the most common inflectional or derivational categories."

- Relevance, thus, makes predictions about the degree of fusion among the elements that make up complex words.

  The more relevant, the tighter the fusion (from root change to stem modification to affixes to periphrastic expression).

  3. More relevant categories will have more morpho-phonemic effects on the root/stem than less relevant categories.

  3. Categories that are more relevant to e.g., the verb, will occur closer to the root/stem than those that are less relevant.

Degrees of relevance

(J. Bybee 1985)

valence < voice < aspect < tense < mood < number agreement <

person agreement < gender agreement

where X < Y means that X is more relevant than Y, X has more morphophonemic effect than Y, and X is closer to the stem/root than Y.

- English:

has been seen	had been walking	might have been seen
TNS/ASP - VOICE VOICE	TNS/ASP - ASP	MOOD - TNS/ASP -

Valence

- The number and type (SUBJECT, OBJECT, INDIRECT OBJECT…) associated with an argument taking predicate such as a Verb.

  $\text{Morris}_{\text{SUBJ}}$ tickled the cat_{OBJ}

  $\text{Hilda}_{\text{SUBJ}}$ showed the frog_{OBJ} to the clown_{IO}

Valence changing morphology

- Operations on verbs that increase or decrease their valency and, according, alter their meanings.
- Pangutaran Sama (Malayo-Polynesian): Applicative

n-bəlli aku taumpa' (ma si Andi)
ACT-buy 1SG.NOM shoe DAT PERS ANDY
`I bought some shoes for Andy'

n-bəlli-an aku si Andi taumpa'
ACT-buy-APP 1SG.NOM PERS ANDY shoe
`I bought Andy some shoes'

Valence: Causative

(J. Bybee 1985)

- Causatives lead to lexical pair (lexical causatives):

  die v. kill (= cause to die, but more as well)

  fall v. fell (= make fall, but mostly of trees)

- Morphological causatives: Luganda

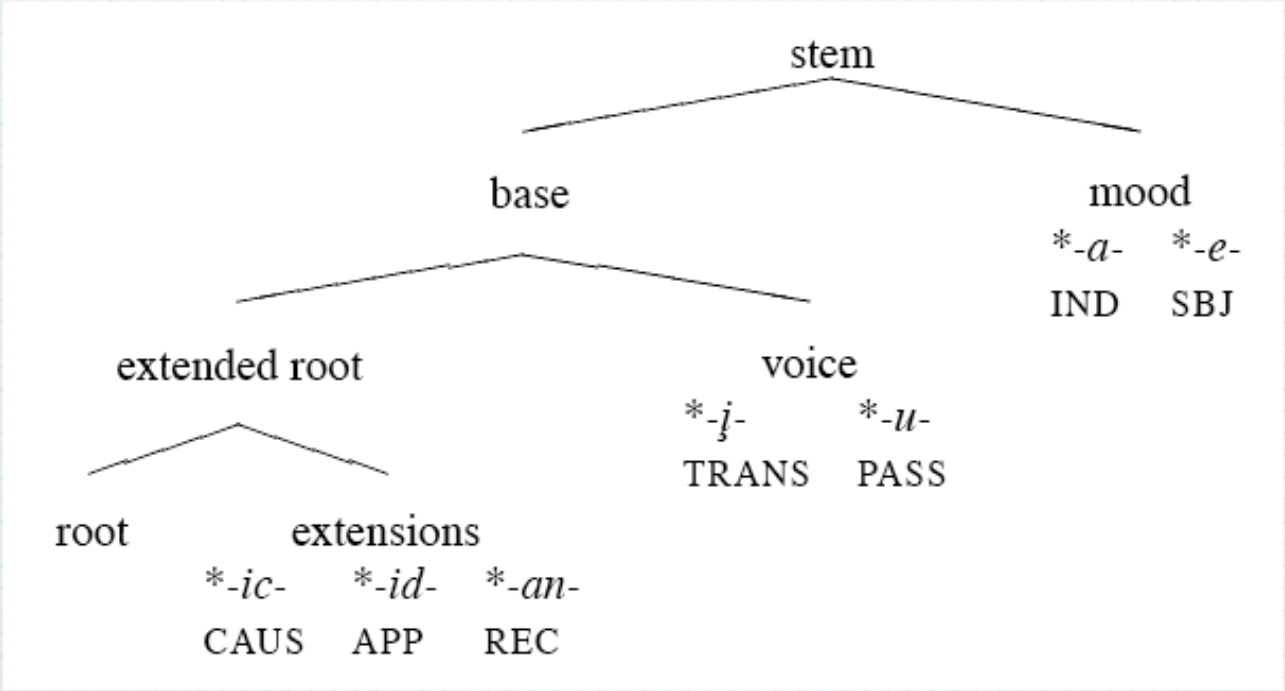
  kùleèta `to bring' v. kùleèsa `to make bring'

  kùgoberera `to follow' v. kùgobereza `to make follow'

  kùbala `to count' v. kùbaza `to multiply'

Bantu complex verbs

(J. Good 2005)



Voice: Passive

(J. Bybee 1985)

- Valence decreasing, but meaning preserving

  Japanese

  sensei=ga Taroo=o sikat-ta
  teacher-NOM Taroo-ACC scold-PAST
  `The teacher scolded Taroo'

  Taroo=ga (sensei=ni) sika-are-ta
  Taroo-NOM teacher-OBL scold-PASS-PAST
  `Taroo was scolded by the teacher'

Voice: Passive

(J. Bybee 1985)

- Chichewa

  mkângo u-ku-phwány-íts-a chigawéngá maûngu

  3-lion 3SM-PRES-CAUS-FV 7-terrorist 6-pumpkins

  `The lion is making the terrorist smash the pumpkins'

  chigawêngá chi-ku-phwány-íts-idw-á máûngu (ndí mkângo)

  7-terrorists 7SM-PRES-CAUS-PASS-FV 6-pumpkins by 3-lion

  `The terrorist is made to smash the pumpkins (by the lion)

- Russian homework
- Spanish, where -se sometime indicates passive and sometimes takes on "idiomatic" sense:

  acordar `to agree upon' v. accordarse (a) `to remember

  echar `to throw' v. acharse `to begin to'

Aspect

(J. Bybee 1985)

- Aspect concerns the nature and the shape of the action or state described by the verb.
- Perfective: "(inceptive, punctual, completive) view the situation as a bounded entity, and often put emphasis on its beginning or end"
- Imperfective: "does not view the situation as bounded, but rather as ongoing in either a durative, continuative, or habitual sense."

  Does the situation/event denoted by the verb change or is it static?

  Does the event or action continue through time or does it occur instantaneously?

  Does the event or action have an identifiable endpoint or is it indeterminate with respect to an endpoint?

  Does the event or action occur once or repeatedly?

Aspect

(J. Bybee 1985)

- "Aspect refers exclusively to the action or state described by the verb."
- Perfective: "(inceptive, punctual, completive) view the situation as a bounded entity, and often put emphasis on its beginning or end"
- Imperfective: "does not view the situation as bounded, but rather as ongoing in either a durative, continuative, or habitual sense."
- Spanish

Juan leyó el libro
John read.PERF the book
`John read the book'

Juan leía el libro
John read.IMPERF the book
`John was reading/used to read the book'

Aspect

(J. Bybee 1985)

- Russian

on učil novuyu rol'
he study-PST.MASC new role
`he studied the new role'

on vyučil novuyu rol'
he PFX-study-PST.MASC new role
`he finished studying the new role'

on vsegda otlično vyučival vse svoj rol'i
he always well PFX-study-IMP- PST.MASC all his roles
`he always studied his roles well'

Tense

"Tense is grammaticalized expression of location in time" (Comrie 1985)

"Tense refers to the grammatical expression of the time of the situation described by the proposition, relative to some other time." (Bybee 1985)

Sarah scored an astounding 42 points. = relative to utterance time

Sarah had scored an astounding 42 points, before her parents arrived at the gym. = relative to an established time in the discourse

Tense

- ChiBemba

ba-àlí-bomb-ele	`they worked (before yesterday)'	REMOTE PAST
ba-àlíí-bomba	`they worked (yesterday)	REMOVED PAST
ba-àcí-bomba	`they worked (today)	NEAR PAST
ba-à-bomba	`they worked (last 3 hrs)	IMMEDIATE PAST
ba-àlàà-bomba	`they'll work (next 3 hrs)	IMMEDIATE FUTURE
ba-léé-bomba	`they'll work (later today)	NEAR FUTURE
ba-kà-bomba	`they'll work (tomorrow)	REMOVED FUTURE
ba-ká-bomba	`they'll work (after tomorrow)	REMOTE FUTURE

Mood (and Modality)

- What the speaker's attitude is toward a proposition (is it true or false?; is it reliable or speculative?)
- The use the speaker makes of a proposition in a discourse.

What did Sarah sing?	INTERROGATIVE MOOD
If I were king of the forest, I'd eat whatever I wanted.	SUBJUNCTIVE MOOD

Mood (and Modality)

- Sherpa evidentials

ti-gi cenyi caaq-sung
he-ERG cup break-PFV.DIRECT
`he broke the cup (eyewitness or direct evidence)

ti-gi cenyi caaq-no
he-ERG cup break-PFV.INDIRECT
`he broke the cup (hearsay or indirect evidence)

Agreement

- A general notion for when co-occurring elements display grammatical properties such as person/number/gender which reflect a syntactic relation between them.
- Portuguese

eu	falo	`I speak'	nós	falo	`we speak'
tu	falas	`you (sg) speak'	vós	falais	`you (pl) speak'
ele	fala	`he speaks'	eles	falam	`they speak'

Study of 50 languages: generalizations relative to sample

- Aspect closer to stem than tense in 8 lgs out of 18 that have both, while opposite order did not occur.
- Aspect closer to stem than mood in 10 lgs, out of total of 23 that have both - mood never closer than aspect.
- Aspect closer than person in 12 out of 21 lgs (Navaho displays opposite order).
- Tense closer to stem than mood in 8 lgs out of 20 that have both (Ojiwa has opposite order).
- Tense closer to stem than person in 8 out of 17 with both (Navaho has opposite order).
- Mood closer to stem than person in 13 out of 26 with both; 5 lgs have opposite order.

Discussion

- There appears to be a tendency for the relative orders of markers with grammatical meanings relative to the stem and relative to each other.
- This is identifiable when the markers are ordered on the same side of the stem relative to one another.
- This identifiable when there is a clear bi-unique relation between form and content, i.e., classic morphemes.
- The ordering, when observable, seems to follow the strategy of layering the markers in terms of "semantic relevance" wrt the stem and one another.

Discussion

- But, what about exceptions with respect to expected orders?
- What about the large number of languages for which such orderings are irrelevant?
- Both of these questions appear to be more compatible with explanations that appeal to historical and semantic (cognitive) motivations, than to ones that appeal to mandates from a highly specified language faculty.
- The former is also more parsimonious, since it appeals to factors which are known to play necessary roles in non-linguistic as well as linguistic domains.

Compounds

- The distinction between compounding and other word-formation devices is always clear, since diachronically elements in compound can turn into affixes.
- Two basic types of compounds
- Root compounds formed by combining more than one lexeme:

  thrillride, bunny rabbit, rattlesnake, water soluble
- Synthetic compounds combine a verb lexeme with an element construable as a syntactic argument or adjunct:

  songwriter, troublemaker, handwoven, machine readable

Compounds

- Endocentric compounds have a semantic head:

  [student [film society]]
  [[student film] society]

- The head of a compound determines what kind of thing the compound denotes
- Exocentric compounds don't have a semantic head:

  pickpocket, lazybones, cutthroat, redcoat

- Appositional compounds conjoin elements

  Austria-Hungary, mother-child, philosopher-king, washer-dryer

English root compounds

- English allows productive compounding of most categories with nouns:

N+N	housewife, penknife, dressing gown salad dressing, party dress, shopping list
A+N	blackbird, well-wisher, happy hour postal order, nervous system, medical officer
P+N	overcoat, outhouse, inroads downtrend, underpass
V+N	swearword, rattlesnake

English root compounds

- Compounding is a bit harder with adjectives:

  N+A trigger-happy, world-weary, earth-shattering
  water soluable, girl crazy, class conscious

  A+A rough-cut, well-formed, good-looking, worldly-wise
  icy cold, bright pink, dark blue

  P+A off-white, ongoing, inborn
  over-explicit, underripe

- And even harder with verbs:

  P+V offload, overlook, up-stage
  overfeed, underexploit, overcook

- Let's think about over.

Cross-linguistic compounding

- Productivity of compounding varies cross-linguistically
- Many languages use PPs to express English compounds

  garden gnome liberation front
  tuinkabouterbevrijdingsfront
  Front de Libération des Nains de Jardin
  Movimento Autonomo per la Liberazione delle Anime da Giardino

- Germanic compounding:

  woon-ruimte-verdelings-advies-commissie
  'living space division advice committee'

  milieu-effect-rapportage-bij-een-komst
  'environmental effect reporting meeting'

Compounding

- The line between compounding and derivation can be blurry
- Affixes usually arise via a process of grammaticalization
  - English hopeful, heartless
- Neo-classical compounds

  bio-logy, eco-logy, tomo-graphy
  dog-ology, eco-friendly
  euro-crat, afro-centric, cyber-café

Compounding

- Compounding in some languages involves interfixes or linking elements
- Greek

  pag-o-vuno 'iceberg' < pag-os 'ice', vun-o 'mountain'
  psom-o-tiri 'bread and cheese' < psom-i 'bread', tir-i 'cheese'

- Dutch stem allomorphy

  schaap 'sheep'

schaap-herder	'shepherd'
schaap-s-kop	'sheep's head'
schap-en-vlees	'mutton'

  kind 'child'

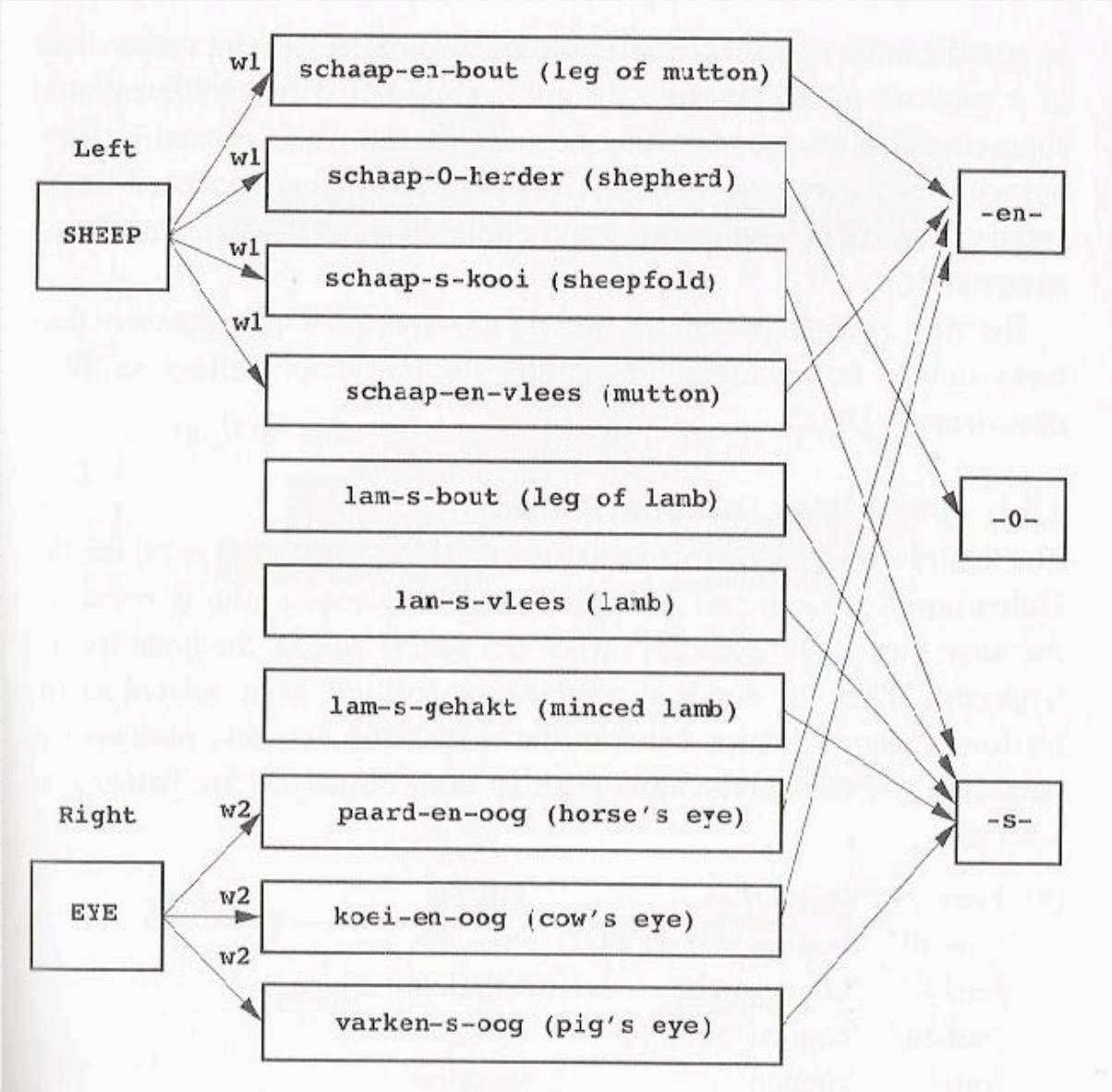
kind-er-wagen	'stroller'

Dutch Compounding

Table 7.1
Features and their values for a hypothetical instance base of Dutch compounds. *L* denotes the linking element. The numbers in parentheses refer to the first and second constituents.

Modifier (1)	Head (2)	Nucleus (1)	Onset (2)	Coda (2)	L	Translation
schaap	bout	aa	b	t	-en-	'leg of mutton'
schaap	herder	aa	h	r	-∅-	'shepherd'
schaap	kooi	aa	k	i	-s-	'sheepfold'
schaap	vlees	aa	v	s	-en-	'mutton'
lam	bout	a	b	t	-s-	'leg of lamb'
lam	vlees	a	v	s	-s-	'lamb'
lam	gehakt	a	g	t	-s-	'minced lamb'
paard	oog	aa	—	g	-en-	'horse's eye'
koe	oog	oe	—	g	-en-	'cow's eye'
varken	oog	e	—	g	-s-	'pig's eye'

Dutch Compounding



Dutch Compounding

- The notion of building up compounds syntagmatically is called into question:

  it does not seem that one can categorically identify conditions that predict the type of linking vowel.

- It is not the case that there is a basic rule-based pattern and then irregular deviations from it, since the linking strategy for novel compounds is not random.

- In order to be descriptively adequate an account must reflect the consensus observed for native speaker judgments.

Dutch Compounding

- The type of linking vowel is probabilistically determined:

  one needs to know the paradigms of existing compounds and their linking vowels in order to a calculation of which is the most likely linking element in a new compound.

- Presupposes (1) the existence of stored compounds, (3) the capacity to compare across the paradigm of similar wordforms, and (4) calculations of similarity and probabilities.

- If humans do this, how should this be reflected in theoretical models?

Turkish compounds

- Turkish simple compounds

N+N	baş bakan	'head minister' ('Prime Minister')
	orta orkul	'middle school'
A+N	büyük anne	'great mother' ('grandmother')
	kırk beyaz	'forty foot' ('centipede')
N+A	süt beyaz	'milk white'
	el-i açık	'his-hand open' ('generous')
N+V	dal bastş	'branch pressed' ('large' (cherries))
	yurt sever	'land loving' ('patriot')
V+V	vurdum duymaz	'I-hit it-doesn't-feel' ('thick-skinned')
?+V	şıp sevdi	'plop! he-has-fallen-in-love' ('impressionable')

Turkish compounds

- These compounds are a single word for stress, but violate vowel harmony
- Meanings are often lexicalized, with non-compositional meanings and non-referential parts
- Not very productive

Turkish compounds

- Turkish possessives

  ev-i
  room-3SG
  'his room'

  müdür-ün ev-i
  director-GEN room-SG
  'the director's house'

- The izafet construction forms compounds using possessive morphology
- Definite vs. indefinite izafet

Turkish compounds

- Indefinite *izafet*

  yatak oda-sı
  bed room-3SG
  ‘bedroom’

  kılıç balığ-ı
  sword fish-3SG
  ‘swordfish’

  2000 sene-si
  2000 year-3SG
  ‘the year 2000’

  Ingiliz tarih-i
  Englishman history-3SG
  ‘English history’

Turkish compounds

- Definite izafet

  uzman-ın rapor-u
  expert-GEN report-3SG
  'the expert's report'

  otomobil-in tekerlekler-i
  car-GEN wheels-3SG
  'the wheels of the car'

  hafta-nın günler-i
  week-GEN days-3SG
  'the days of the week'

Turkish compounds

- Referential vs. non-referential uses

  Orhan ism-i
  Orhan name-3SG
  'the name "Orhan"'

  Orhan-ın ism-i
  Orhan-GEN name-3SG
  'Orhan's name'

  çoban kız-ı
  shepherd girl-3SG
  'the shepherd girl'

  çoban-ın kız-ı
  shepherd-GEN girl-3SG
  'the shepherd's daughter'

Turkish compounds

- Some indefinite izafets have become lexicalized:

  binbaşi 'thousand head-3SG' ('army major')
  denizaltı 'sea underside-3SG' ('submarine')
  hanımeli 'lady hand-3SG' ('honeysuckle')

- Normally, the plural suffix precedes the possessive, but:

  binbaşilar 'majors'

- And, another possesive marker can appear:

  binbaşisi 'his major'