Defaults and head marking: maximal inheritance, minimal overriding

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outline

1. Network Morphology fundamentals
2. Derivation and default inheritance
3. Derivational relatedness
4. Canonical derivation and inheritance
   - Russian expressive morphology, non-canonical
5. Headed derivatives
6. Defaults and the canonical

1. Network Morphology fundamentals

Network Morphology fundamentals

Knowledge representation

- word structure facts distributed over a network of nodes
- nodes linked by inheritance
- inheritance by default
- inheritance can be from more than one node

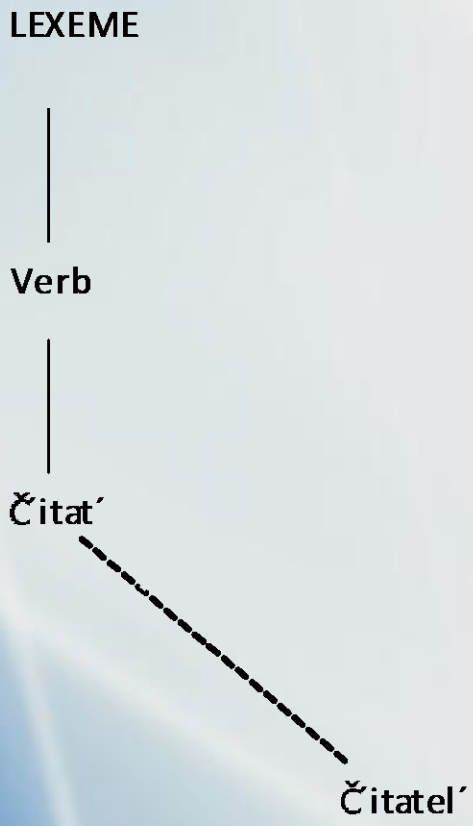
Network Morphology fundamentals

Theoretical

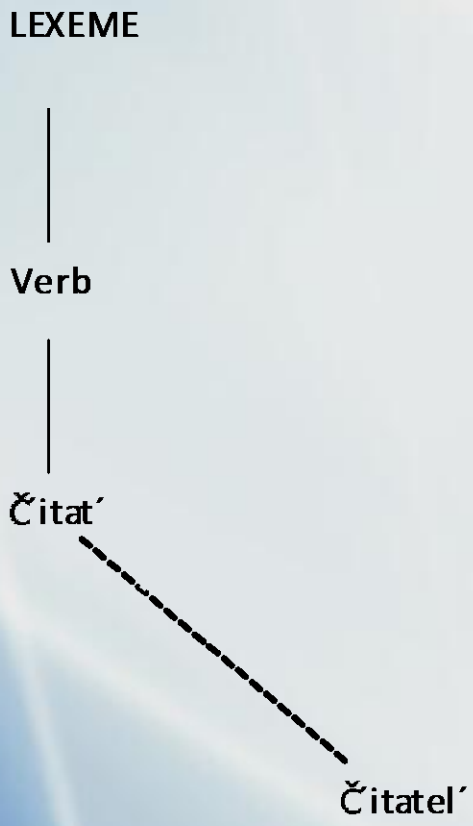
- lexeme as minimal sign
  - lexical entries are lexemes ‘filled in’
- inferential-realizational
  - features expressed as an attribute path, word form as value
- centrality of the paradigm
  - lexical entry’s theorems
- autonomous morphology
  - orthogonal hierarchies, multiple inheritance
- regularity as degree
  - *default* inheritance

2. Derivation and default inheritance

derivation and default inheritance

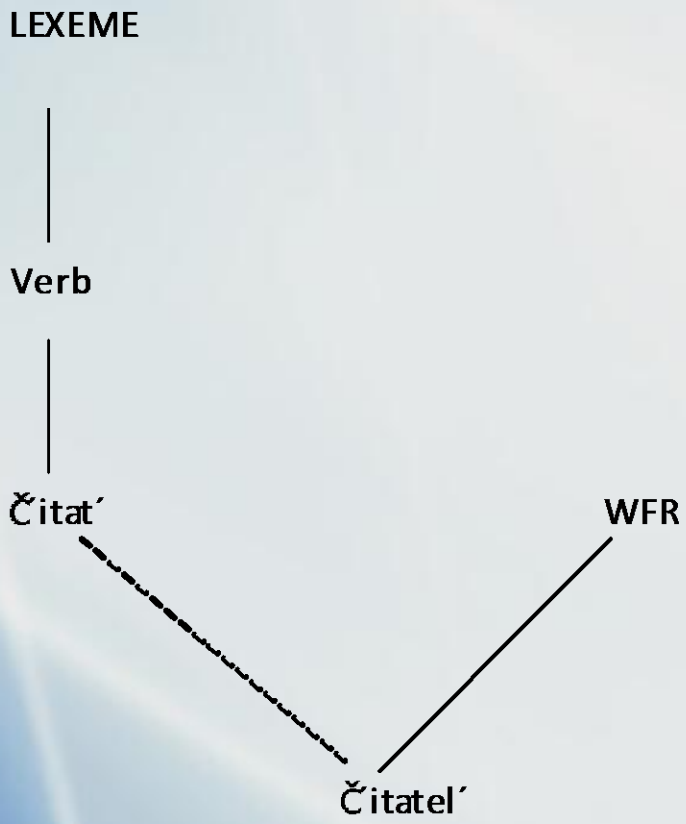


derivation and default inheritance

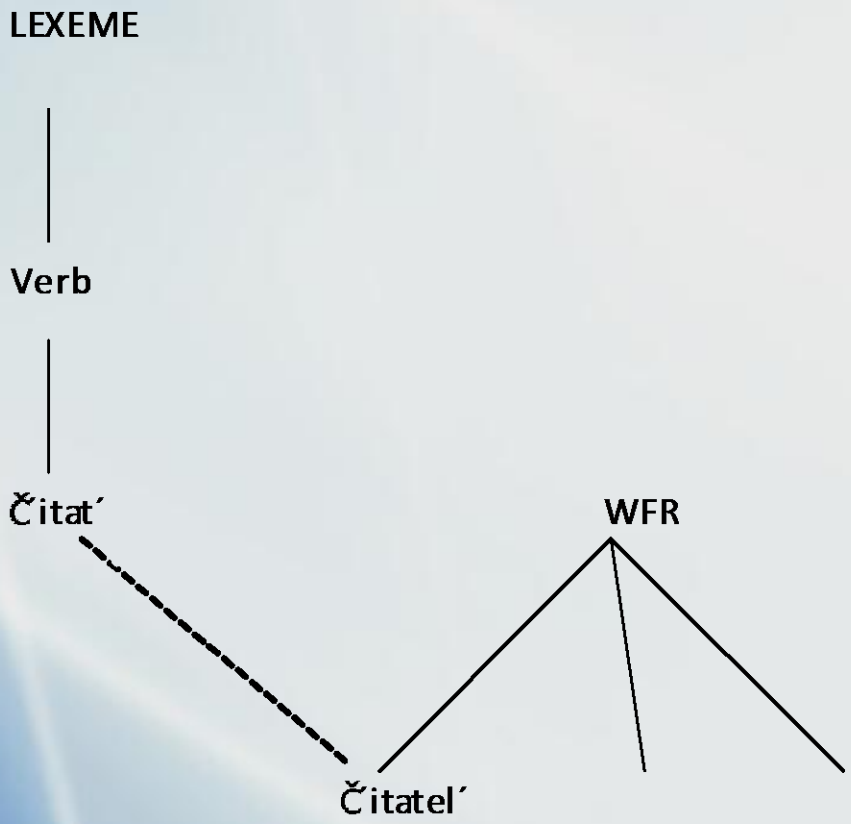


pisatel ´'writer'
xranitel ´
'custodian
grabitel ´ 'thief'

derivation and default inheritance



derivation and default inheritance



derivation and default inheritance

$[\ [x]_X\ y\ ]_Y$

$[[x]_V\ er]_N$ 'one who V's'

$[[bak]_V\ er]_N$

$[bake]_V$

Construction Morphology
(Booij 2005:124)

Also:
Riehemann (1998)
Kriger&Nerbonne (1993)
Deo (2007)

inflection and derivation

1	build versions of a lexeme	build new lexeme
2	determined by syntax	not determined by syntax
3	obligatory	not obligatory
4	fully productive	not fully productive
5	transparent	not always transparent
6	all base features inherited	some base features overridden
7	after derivational exponent	before inflectional exponent

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inflection and derivation

6	all base features inherited *maximal* inheritance defaults	Some base features inherited *non-maximal* inheritance overrides

inflection and derivation

some base features inherited

non-maximal inheritance

overrides: morphosyntactic features

3. Derivational relatedness

derivational relatedness

Č´ITAT´		Č´ITATEL´
phon level		*phon level*
root = /č´it-/		-
stem 2 = /č´ita-/		/č´ita-tel´/
sem level	>	*sem level*
‘read’		‘person who reads’
syn level		*syn level*
syn cat = V		syn cat = N
args = 2 (NP_NP)		

derivational relatedness

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derivational relatedness

Č ´ ITAT ´

phon level

root = /č ´ it-/

stem 2 = /č ´ ita-/

sem level

‘read’

syn level

syn cat = V

args = 2 (NP_NP)

>

Č ´ ITATEL ´

phon level

-

/č ´ ita-tel ´ /

sem level

‘person who reads’

syn level

syn cat = N

derivational relatedness

Č´ITAT´ → Č´ITATEL´

mor level → *mor level*

Class V_1 → Class N_1

derivational relatedness

Č´ITAT´ → Č´ITATEL´

mor level → *mor level*

Class V_1 → **Class N_1**

derivational relatedness

Č´ITAT´		Č´ITATEL´
mor level	□□>	*mor level*
Class V_1		**Class N_1**

Principle of the morpholexically coherent lexicon (Spencer 2005)
i.e. correspondence among syntactic, semantic and morphological properties

WFR

Base	tel ´ WFR	Derivative
	phon level	
/x/	/x + tel ´/	
	sem level	
X	‘person who Xes’	
	syn	
V	syn cat = N	

Lexeme Formation Template (Construction Morphology)

Base	tel ´ LFT	Derivative
	phon level	
/x/	/x + tel ´/	
	sem level	
X	‘person who Xes’	
	syn	
V	syn cat = N	

relatedness and inheritance

relatedness and inheritance

lexemic level	*inheritance source*	
	base	*LFT*
syntactic	**x**	✓
semantic	!✓!	✓
phonological	! ✓!	✓
morphological	**x**	✓

čitat´→ čitatel´

formal analysis

```
Č´itat´:
    <> == VERB
    <gloss> == read
    <conjugation_class> == V_I:<mor>
    <root all> == č´it
    <stem 2> == <root all> a
    <valence> == 2.

Č´itatel´:
    <> == LFT_TEL´
    <base> == "Č´itat´:<>".
```

formal analysis

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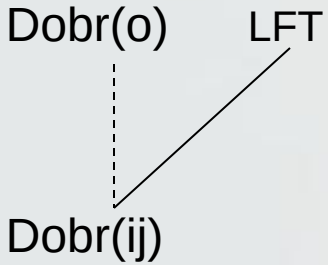
Č´itatel´:
    <> == LFT_TEL´
    <base> == "Č´itat´:<>".

<base gloss>  == "č´itat´:<base gloss>"
<base stem 2> == "č´itat´:<base stem 2>"
```

conversion

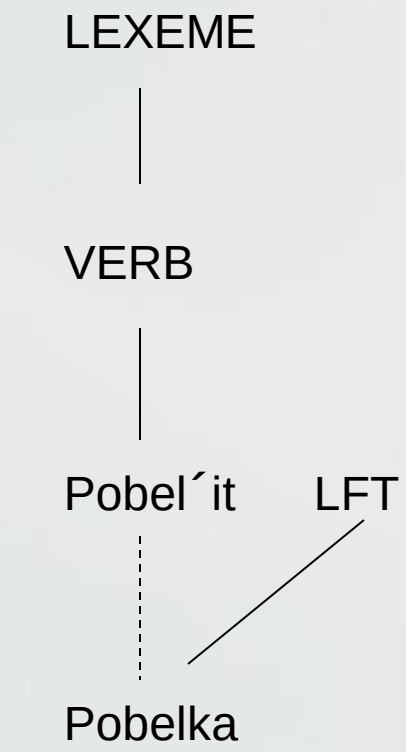
lexemic level	*inheritance source*	
	base	*LFT*
syntactic	**x**	✓
semantic	! ✓ !	✓
phonological	! ✓ !	**x**
morphological	**x**	✓

dobro ‘good deed’
dobryj ‘kind’



transposition

lexemic level	*inheritance source*	
	base	*LFT*
syntactic	**x**	✓
semantic	✓	**x**
phonological	✓	✓
morphological	**x**	✓



pobelit´ ‘whitewash’
pobelka ‘whitewashing’

4. Canonical derivation & inheritance

canonical derivation & inheritance

- derivative is maximally distinct from base while maintaining some connection with base

canonical derivation & inheritance

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- some formal connection with base keeps the relation morphological

canonical derivation & inheritance

- derivative is maximally distinct from base while maintaining some connection with base
- some formal connection with base keeps the relation morphological
- in an inheritance framework, *canonical* derivation is maximal *inheritance* from the LFT node

non-canonical derivation

- towards maximal inheritance from Base, minimal inheritance from LFT

non-canonical derivation

- towards maximal inheritance from Base, minimal inheritance from LFT
- inheritance of Base's morphosyntactic features

non-canonical derivation

- towards maximal inheritance from Base, minimal inheritance from LFT
- inheritance of Base's morphosyntactic features
- category preserving derivation

non-canonical derivation

lexemic level	*inheritance source*	
	base	*LFT*
syntactic	✓	**x**
semantic	! ✓ !	✓
phonological	! ✓ !	✓
morphological	**x**	✓

category preserving derivation

lexemic level	*inheritance source*	
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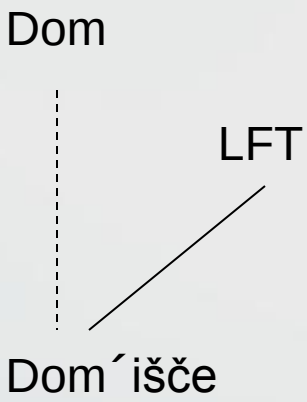
morphological	**x**	✓



category preserving derivation

gromadn-yj ryž-ij dom-išč-e

huge-SG.**M** rust-SG.**M** house(**M**)-AUG-SG(IV)

'The huge red-rust house' (Chekov, *Svetlaja ličnost´*)

- Class I → masculine, e.g. *dom*
- Class II → feminine
- Class III → feminine
- **Class IV → neuter**

category preserving derivation

s godoval-ym brat-išk-oj

with year-SG.**M**.INS brother(**M**)-PEJ-SG.INS(II)

'with your one-year-old brother'

- Class I → masculine, e.g. *brat*
- **Class II → feminine**
- Class III → feminine
- Class IV → neuter

Russian expressive morphology

dom ‘house’, *topor* ‘axe’, *kniga* ‘book’, *šinel´* ‘coat’

Base	DIM	AUG	PEJ	AFFECT
dom	domik	domišče	domiško	-
topor	toporik	toporišče	toporiško	toporčik
kniga	knižka	knižišča	-	knižočka
Šinel´	šinelka	-	šineliška	šineločka

Based on Stankiewicz (1968)

category preserving derivation

expressive morphology is an example of category preserving derivation (Stump 1991, 1993, 2001: ch 4)

5. Headed derivatives

headed derivatives

- The product of a category preserving rule of word formation is a *headed* expression (when PFM goes derivational)
  - endocentric compounds

    [tooth [brush]$_{HEAD}$]
  - output of expressive derivation rule

    [[dom]$_{HEAD}$ ik]
  - head&Modifier / subsective semantics

headed derivatives

- base features persist
  - semantics
  - (important) morphosyntactic features

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  - rule allows base features to persist (PFM)
  - Network Morphology: base features are non-canonically *inherited* by the derivative lexical entry

headed derivatives

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  - semantics
  - (important) morphosyntactic features
- a property of a category preserving word formation rule is *transparency* (Stump 2001: 99)
  - rule allows base features to persist (PFM)
  - Network Morphology: base features are non-canonically *inherited* by the derivative lexical entry
    - *šineliška* (fem), *bratiška* (masc)
    - Breton *bag* 'boat' → *bagig* 'little boat'; *bihan* 'small' → *bihanig* 'a little too small' (Stump 2001: 100)

headed derivatives

- category changing rules yield unheaded expressions
  - o [čitatel´]
  - o (important) features from the base are *overridden* (inheritance from the LFT)
  - o that’s canonical derivation

head marking: maximal base inheritance

- headed compounds
  - head is always inflected (Stump 2010)
  - *outlive/outlived* [out [live-d]]
  - *understand/understood* [under [$stood_{PST}$]]
  - *mothers-in-law* [[mother-s] in law]
  - *grandstand/grandstanded* $[grandstand]_V$-ed
    - $V \rightarrow N \rightarrow compound_N \rightarrow V$ conversion

head marking: maximal base inheritance

- headed derivatives
  - inflecting the head is an option
  - o *bratiška* [[brat] išk]-a edge marking
  - o Shughni, East Iranian ‘little baby goats’
    gujbucenik [[gujbuc-en]$_{PL}$ ik] head marking

head marking: maximal base inheritance

- headed derivatives

  gujbucenik [[gujbuc-en]$_{PL}$ ik] head marking

čost	*wam*	*guj buc– **en** - ik=en*	*dis*	*mayǯůnj-idi*
appear.PST	her.OBL	babygoat-**PL**-DIM =3.PL	very	hungry-INTENS

ĈThe dear little kids appeared very hungry to herÕ

head marking: maximal base inheritance

- for headed expressions, as well as a rule of exponence you need a rule of *composition* (Stump 2010): does the head inflect or the whole expression?

head marking: maximal base inheritance

Head Application Principle (Stump 2005: 67)

Where stem *d* arises from stem *b* through the application of a word-word rule *r*, then for each cell <*b*,σ> in *b*'s paradigm, if <*b*,σ> has realization *x*, then the corresponding cell <*d*,σ> in *d*'s paradigm has realization *r(x)*.

head marking: maximal base inheritance

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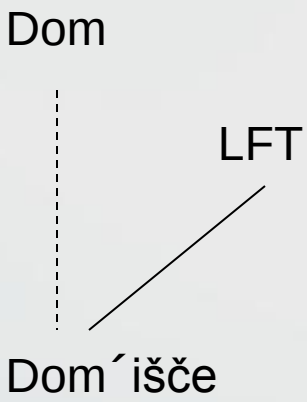
- stem *b* cell < gujbuc, {NUM:PL}> is realized as ***gujbucen***
- stem *d* is ***gujbucik*** through rule *r*
- stem *d* cell <gujbucik, {NUM:PL}> realized as ***gujbucenik***, i.e. < gujbuc, {NUM:PL}> ik

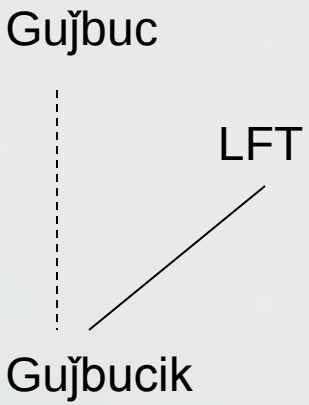
category preserving derivation

lexemic level	*inheritance source*	
	base	*WFR*
syntactic	✓	**x**
semantic	! ✓ !	✓
phonological	! ✓ !	✓
morphological	**x**	✓



maximal Base inheritance

lexemic level	*inheritance source*	
	base	*WFR*
syntactic	✓	**x**
semantic	! ✓ !	✓
phonological	! ✓ !	✓
morphological	✓	**x**



formal analysis

1. LFT_DIMINUTIVE:
   <> ==
   LFT_HEAD_MARKING <sem feature> == small <deriv aff> == ik.

2. LFT_HEAD_MARKING:
   <> ==
   LFT_CAT_PRESERV <mor> == "<base mor>""<deriv aff>"

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2. LFT_HEAD_MARKING:
   <> ==
   LFT_CAT_PRESERV <mor> == "<base mor>""<der aff>"

<mor pl> == "<base mor pl>" "<der aff>"

formal analysis

1. LFT_CAT_PRESERV:
   _<> ≡≡
   LEXEME <syn> ==
   “<base syn>” <gloss> ==
   λx[“<sem feature>”(x)& “<base gloss>”(x)]

   ...

formal analysis

Theorems of Guǰbucik

```
Guǰbucik:<syn cat> = n.
Guǰbucik:<gloss> = small baby_goat.
Guǰbucik:<sem feature> = small.
Guǰbucik:<mor sg> = guǰbuc ik.
Guǰbucik:<mor pl> = guǰbuc en ik.
```

finding head marking

finding head marking

- Greg's Sanskrit example
  - *car* 'act', *abhicar* [abhi [car]]
  - 3sg present indicative [abhi [car-ati]]
    - but why not [abhi [car]]-ati ??
  - 3sg imperfect *a-carat*, *abhy-a-carat*, [abhi [a-car-at]]

finding head marking

- PFM Principles:
  - if head is marked in one cell, it's marked in all cells (PFM's Paradigm Uniformity Generalization)
  - coderivatives are either all head marking or not, i.e. head marking stipulated in the rule (PFM's Coderivative Uniformity Generalization)

Russian prefixation

Russian prefixation

- Nouns
  - *pod-gruppa* ‘sub-group’, *ne-znanie* ‘ignorance’
- Adjectives
  - *ne-gramotnyj* ‘illiterate’, *bez-opasnyj* ‘dangerous’, *pre-dobryj* ‘overly kind’
- Verbs
  - *za-govorit´* ‘begin to speak’, *pere-delat´* ‘alter’, *pere-pisat´* ‘to rewrite’, *prij-ti* ‘come’

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V_II	V_I	V_III
govorju govoriš´	delaju delaeš´	pišu pišeš´
zagovorju zagovoriš´	peredelaju peredelaješ´	perepišu perepišeš´

1st and 2nd sg non-past

Russian prefixation

- Verbs
  - *prij-ti* ‘come’
    - *idu, idëš´*; *šla* (past feminine singular)
    - *pridu, pridëš´; prišla* (past feminine singular)

Russian prefixation

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- Derived forms maintain inflectional class of the base, as well as idiosyncracies, e.g. suppletion
  - *zagovoriš´* [za [govor-iš´]] head marking

Russian prefixation

- an extension of the Coderivative Uniformity Genralization:

  ‘all prefix-based category preserving derivation in Russian results in a head marked expression’

Formal analysis

- an extension of the Coderivative Uniformity Genralization:

  ‘all prefix-based category preserving derivation in Russian results in a head marked expression’

```
LFT_HEAD_MARKING:
    <> == LFT_CAT_PRESERV
    <mor> == “<deriv aff>” “<base mor>”
    <stem> == PREFIXATION.

PREFIXATION:
    <stem> == “<deriv aff>” “<base stem>”.
```

Formal analysis *negramotnyj* ‘illiterate’

Formal analysis *negramotnyj* ‘illiterate’

```
1 LFT_CAT_PRESERV:
   %<> == NOUN       %too restrictive
    <> == LEXEME
    <syn> == “<base syn>”
    <gloss> == λx [“<sem feature>”(x) &
                                  “<base gloss>” (x)]
    <stem> == SUFFIXATION.

2 LFT_HEAD_MARKING:
    <> == LFT_CAT_PRESERV
    <mor> == “<deriv aff>” “<base mor>”
    <stem> == PREFIXATION.

3 LFT_NEG_ADJ:
    <> == LFT_HEAD_MARKING
    <deriv aff> == ne
    <sem feature> == ¬ .
```

6. Defaults and the canonical

defaults and the canonical

	inflection	vs	derivation
1	build versions of a lexeme		build new lexeme

Canonical derivation

Lexeme 1 → Lexeme 2

maximally distinct, while staying morphologically connected

defaults and the canonical

Canonical derivation

Lexeme 1 → Lexeme 2

maximally distinct, while staying morphologically connected

From Base

minimal inheritance

maximal overriding

From LFT

maximal inheritance

defaults and the canonical

Least canonical derivation

Lexeme 1 → Lexeme 2

minimally distinct, while staying morphologically connected

From Base
maximal inheritance
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From LFT
minimal inheritance

defaults and the canonical

Least canonical derivation

Lexeme 1 → Lexeme 2

minimally distinct, while staying morphologically connected

And therefore most like inflection

Lexeme$_{\alpha}$

1 syn word$_{\alpha}$

2 syn word$_{\alpha}$

From Base

maximal inheritance

no overriding

From LFT

no inheritance

defaults and the canonical

defaults versus default situations

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- defaults characterize system-driven generalization, A dominating B implies B gets everything A has *unless overridden*; hierarchical wrt non-default

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- default situations depend on perspective; characterize canonicity; non-hierchical wrt non-default situation

defaults and the canonical

defaults versus default situations

- defaults characterize system-driven generalization, A dominating B implies B gets everything A has *unless overridden*; hierarchical wrt non-default
- default situations depend on perspective; characterize canonicity; non-hierchical wrt non-default situation
  - Canonical: default situation may mean overriding the default
  - Non-canonical: overriding the default situation may mean inheriting the default