Paradigm Function Morphology I: The 'basics'

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Inferential-realizational theories

A word's association with a particular set of morphosyntactic properties determines a sequence of rule applications defining that word's inflectional form.

1 Definitions

Paradigm function

A paradigm function is a function which, when applied to the root of a lexeme L paired with a set of morphosyntactic properties appropriate to L, determines the word form occupying the corresponding cell in L's paradigm.

(1) ⟨BE, {1st, singular, present}⟩ → *are*

⟨BE, {1st, singular, present}⟩ is a *form/property-set pairing* (FPSP)

Paradigm functions are static well-formedness conditions on cells:

(2) A cell ⟨W,σ⟩ in the paradigm of some lexeme L in some language ℓ is well-formed only if ℓ's paradigm function relates ⟨W, σ⟩ to ⟨X, σ⟩, where X is L's root.

(3) a. *Lexeme*: The lexical entry for a word
b. *Roots*: A lexeme's default form, devoid of any inflectional marking
c. *Stems*: Any expression to which inflectional exponents may potentially be added
d. *Words*: The syntactically free forms occupying the cells of a lexeme's paradigm

(4) A set τ of morphosyntactic properties for a lexeme of category C is WELL-FORMED in some language ℓ only if τ satisfies the following conditions in ℓ:
a. For each property F:v $\in \tau$, F:v is available to lexemes of category C and v is a permissible value for F.
b. For any morphosyntactic feature F having v_1, v_2 as permissible values, if $v_1 \neq v_2$ and F:$v_1 \in \tau$, then F:$v_2 \notin \tau$.

Extension

Where σ and τ are well-formed sets of morphosyntactic properties, σ is an EXTENSION of τ iff (i) for any atom-valued feature F and any permissible value v for F, if F:v $\in \sigma$; and (ii) for any set-valued feature F and any permissible value ρ for F, if F:ρ $\in \tau$, then F:ρ′ $\in \sigma$, where ρ′ is an extension of ρ.

(5) {TNS: pres, AGR: {PERS: 1, NUM: pl}} is an extension of

a. {TNS: pres, AGR: {PERS: 1, NUM: pl}}
b. {TNS: pres, AGR: {PERS: 1}}
c. {TNS: pres, AGR: {NUM: pl}}
d. {TNS: pres, AGR: { }}
e. {TNS: pres}
f. {AGR: {PERS: 1, NUM: pl}}
g. {AGR: {PERS: 1}}
h. {AGR: {NUM: pl}}
i. {AGR: { }}
j. { }

(6) *Format for paradigm functions*:
PF(⟨X, σ⟩) = ⟨Y, σ⟩

A concrete example

(7) PF(⟨*be*, {TNS: pres, AGR: {PERS: 1, NUM: sg}}⟩) = ⟨*are*, {TNS: pres, AGR: {PERS: 1, NUM: sg}}⟩

(8) PF(⟨*be*, σ⟩) = ⟨*are*, σ⟩, where σ = {TNS: pres, AGR: {PERS: 1, NUM: sg}}

Side remark

What about roots associated with more than one lexeme? e.g. *lie* ('recline', 'speak dishonestly')

(9) a. L-index(*lie*) = LIE_1 ('recline')
b. L-index(*lie*) = LIE_2 ('speak dishonestly')

But how do we define what PF is?

2 Realization rules

(10) *Format for realization rules*:
$RR_{n,\,\tau,\,C}(\langle X, \sigma\rangle) =_{def} \langle Y, \sigma\rangle$
a. n is the block to which the rule belongs
b. τ is the property set that the rule can realize through its application
c. C indicates the class of lexemes whose paradigms may be defined by this rule

(11) *Rule argument coherence*:
$RR_{n,\,\tau,\,C}(\langle X, \sigma\rangle)$ is defined iff (a) σ is an extension of τ, (b) L-index(X) $\in$ C, and (c) σ is a well-formed set of morphosyntactic properties of L-index(X).

How does Stump derive:

(12) a. Blocking of *-x* and *-o* in 3sg aorist
b. Special forms for −T, −C?/ specific 3pl marker for present?

(13) *Paninian well-formedness condition on inflectional rule blocks*:
If Q and R are inflectional rules belonging to the same block b, then for any expression X and any complete and well-formed set σ of morphosyntactic properties appropriate to X, either
a. Q and R are not compatible relative to X and σ, or
b. Q and R are compatible relative to X and σ and either,
(i) one is narrower than the other or,
(ii) there is a third rule in block b which is compatible with Q and R relative to X and σ and is narrower than both Q and R.

How can a paradigm function be defined in terms of RRs?

(14) σ = {VFORM: fin, VCE: act, TNS: pres, PRET: no, MOOD: indic, AGR: {PERS: 1, NUM: pl}}

(15) a. PF($\langle$*krad*, $\sigma\rangle$) =
b. PF($\langle$*dáva*, $\sigma\rangle$) =

(16) Narrowest Applicable Rule:
a. $RR_{n,\,\sigma,\,C}$ is narrower than $RR_{n,\,\tau,\,C}$ iff σ is an extension of τ and $\sigma \neq \tau$
b. Where C = C′, $RR_{n,\,\sigma,\,C}$ is narrower than $RR_{n,\,\tau,\,C}$ iff C $\subseteq$ C′.

(17) *Nar_n notation*:
Where $RR_{n,\,\tau,\,C}$ is the narrowest rule in block n which is applicable to $\langle X, \sigma\rangle$, '$Nar_n(\langle X, \sigma\rangle)$' represents the result of applying $RR_{n,\,\tau,\,C}$ to $\langle X, \sigma\rangle$.

So, how do we define PF?

(18) *Paradigm function for Bulgarians verbs*:
Where σ is a complete set of morphosyntactic properties for lexemes of category V, $PF(\langle X, \sigma\rangle) =_{def} Nar_D(Nar_C(Nar_B(Nar_A(\langle X, \sigma\rangle))))$

What if no rule is applicable?

(19) *Identity Function Default*:
$RR_{n,\,\{\ \},\,U}(\langle X, \sigma\rangle) =_{def} \langle X, \sigma\rangle$

What about the PF giving us $\langle$*krádoxme*, {TNS: aor, PRET: yes, AGR: {PERS: 1, NUM: pl}}$\rangle$?

What about the first singular impf. form?

Rules of referral

How do we get the RoR for 2sg having the same form as 3sg in preterite tenses?

(20) *Rule of referral (Bulgarian)*:
Where τ is any complete extension of {PRET: yes, AGR: {PERS: 2, NUM: sg}}, n is any of the rule blocks A to D, and $\sigma' = \sigma/\{$AGR: {PERS: 3}$\}$,
$RR_{n,\,\tau,\,V}(\langle X, \sigma\rangle) =_{def} \langle Y, \sigma\rangle$, where $Nar_n(\langle X, \sigma'\rangle) = \langle Y, \sigma'\rangle$.

What does σ/ρ mean?

(21) a. If σ = {TNS: impf, PRET: yes, agr: {PERS: 2, NUM: sg}}
and
b. ρ = {AGR: {PERS: 3}}
then
c. σ/ρ = {TNS: impf, PRET: yes, agr: {PERS: 3, NUM: sg}}

3 Some PFM practice

(22) *Subject agreement in Nimboran (future tense)*:

	singular	dual	plural
1 EXCL	*ŋgedúo-d-u*	*ŋgedúo-k-d-u*	*ŋgedói-^{i}-d-u*
1 INCL	*maN-ŋgedúo-d-ám*	*ŋgedúo-k-d-ám*	*ŋgedói-k-d-ám*
2	*ŋgedúo-d-e*	*ŋgedúo-k-d-e*	*ŋgedói-k-d-e*
3 MASC	*ŋgedúo-d-am*	*ŋgedúo-k-d-am*	*ŋgedói-^{i}-d-am*
3 FEM	*ŋgedóu-d-um*	*ŋgedúo-k-d-um*	*ŋgedói-^{i}-d-am*

What rules/blocks do we need?

References

Stump, Gregory T. (2001). *Inflectional Morphology: A Theory of Paradigm Structure*. Cambridge University Press: Cambridge.