

## Paradigmatic word formation

### *Word-formation relations in the Pattern-and-Restriction Theory*

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#### 1 Overview

In a paradigmatic approach to word formation like the one informally outlined in Becker (1990), lexical motivation relations between word-formation products and bases are not encoded in terms of syntagmatic word structures; rather, they are described by means of directional, though possibly overlapping, word-formation rules relating products and bases.

In the *Pattern-and-Restriction Theory (PR)* word formation is described in terms of paradigmatic relations between bases and products (Nolda 2012, forthc., in review).

PR is related to, and influenced by, theories such as Aronoff's (1976) theory of word-formation rules and morphological restrictions, Beard's (1995) Lexeme-Morpheme Base Morphology, and in particular Lieb's (2013) Process Model of Word Formation. PR's conception of lexical units is adopted from *Integrational Linguistics* (Lieb 1983).

*PPR* is a computer implementation of PR's core theory (<http://andreas.nolda.org/software.html#ppr>).

This paper outlines basic ideas of PR on the example of canonical and non-canonical word-formation relations in some spoken Modern German system **S**.

## 2 Basic ideas of PR

### Word-formation relations

PR aims at describing, explaining, and predicting statements about *word-formation relations*, underlying motivation relations between lexical units like *drucken* ('to print') and *Drucker* ('press operator'):

(1) /'druk[ə]n/<sub>'to print'</sub><sup>W</sup> >> /'druk[ə]r/<sub>'press operator'</sub><sup>W</sup>

/'druk[ə]n/<sub>'to print'</sub><sup>W</sup>: lexical word consisting of:

1. a word paradigm with the citation form /'druk[ə]n/
2. the lexical meaning 'to print'

/'druk[ə]r/<sub>'press operator'</sub><sup>W</sup>: lexical word consisting of:

1. a word paradigm with the citation form /'druk[ə]r/
2. the lexical meaning 'press operator'

>>: indirectly motivates through word formation

The *indirect word-formation relation* (1) between lexical words is based on the *direct word-formation relation* (2) between the corresponding lexical stems *druck* ('to print') and *Druck-er* ('press operator'):

(2) /'druk/<sub>'to print'</sub><sup>St</sup> > /'druk/ / [ə]r/<sub>'press operator'</sub><sup>St</sup>

/'druk/<sub>'to print'</sub><sup>St</sup>: lexical stem consisting of:

1. a stem paradigm with the citation form /'druk/
2. the lexical meaning 'to print'

/'druk/ / [ə]r/<sub>'press operator'</sub><sup>St</sup>: lexical stem consisting of:

1. a stem paradigm with the citation form /'druk/ / [ə]r/
2. the lexical meaning 'press operator'

>: directly motivates through word formation

In PR, statements about word-formation relations are explicitly or implicitly relativised to a linguistic system, a formation process, and a formation pattern:

(3) a. /'druk/<sub>'to print'</sub><sup>St</sup> ><sub>der(Pattern 1)<sup>S</sup></sub> /'druk/ / [ə]r/<sub>'press operator'</sub><sup>St</sup>  
b. /'druk[ə]n/<sub>'to print'</sub><sup>W</sup> >><sub>der(Pattern 1)<sup>S</sup></sub> /'druk[ə]r/<sub>'press operator'</sub><sup>W</sup>

><sub>der(Pattern 1)<sup>S</sup></sub>: directly motivates through derivation in **S** by means of Pattern 1

>><sub>der(Pattern 1)<sup>S</sup></sub>: indirectly motivates through derivation in **S** by means of Pattern 1

### *Formation patterns*

A *formation pattern* consists of four *formation means*:

#### *Pattern 1*

FM: suffixation with / $[\text{ə}]r$ /

PM: categorisation as {Sing-NStf}

LM: categorisation as {NounSt, Masc-NSt}

SM: building of a concept according to the scheme:  
'agent of an event or process denoted by the basis'

*Formal means* (FM) operate on forms (word or stem forms, or groups thereof):

FM: /'druk/  $\mapsto$  /'druk/ / $[\text{ə}]r$ /

*Paradigmatic means* (PM) operate on paradigmatic categorisations (sets of paradigmatic categories):

PM: {Der-VStf}  $\mapsto$  {Sing-NStf}

*Lexical means* (LM) operate on lexical categorisations (sets of lexical categories):

LM: {VSt}  $\mapsto$  {NounSt, Masc-NSt}

*Semantic means* (SM) operate on concepts (in particular, lexical meanings):

SM: 'to print'  $\mapsto$  'agent of printing'

#### *Formation instances and formation restrictions*

The arguments and values of formation means are combined into (possibly underspecified) *formation instances* of lexical units:

- (4)  $\langle$ /'druk/,  $\langle$ /'druk/ / $[\text{ə}]r$ /,  
{Der-VStf}, {Sing-NStf},  
{VSt}, {NounSt, Masc-NSt},  
'print'  $\rangle$  'agent of printing'  $\rangle$

To each formation pattern, the linguistic system assigns a *formation restriction* on appropriate formation instances:

#### *Restriction 1*

FR: The base form is an umlaut variant (if any in the base paradigm).

PR: The paradigmatic base categorisation contains Der-VStf or Der-VStfGr.

LR: The lexical base categorisation contains VSt or VStGr.

SR: The basis denotes an action.

A direct word-formation relation like (3 a) pertains between a product and  $n$  bases in a linguistic system only if:

1. at least one formation instance of the product can be built from formation instances of the bases by the formation means in the formation pattern, and
2. the involved formation instances fulfil the formation restriction of the formation pattern in the list system.

An indirect word-formation relation like (3 b) pertains between word-like lexical units in a linguistic system if there is a corresponding direct word-formation relation between word- or stem-like lexical units in the linguistic system.

### 3 Non-canonical word-formation relations in PR

#### 3.1 Multiple motivation

##### *Denominal profession nouns*

Lexical units like *Druckerei* ('print shop'), *Metzgerei* ('butcher's shop'), *Feinbäckerei* ('pastry shop'), and *Abtei* ('abbey') can be formed through derivation by means of Pattern 2.

##### *Pattern 2*

FM: deaccentuation and suffixation with /'ai/

PM: categorisation as {Sing-NStf}

LM: categorisation as {NounSt, Fem-NSt}

SM: building of a concept according to the scheme:

'institution for characteristic activities of persons denoted by the basis'

FM: /'druk/ / [ə]r/ → /,druk/ / [ə]r/ /'ai/

PM: {Der-NStf} → {Sing-NStf}

LM: {NounSt, Mask-NSt} → {NounSt, Fem-NSt}

SM: 'press operator' → 'institution for characteristic activities of press operators'

##### *Restriction 2*

FR: The base form is an umlaut variant (if any in the base paradigm).

PR: The paradigmatic base categorisation contains Der-NStf or Der-NStfGr.

LR: The lexical base categorisation contains NounSt or NounStGr.

SR: The basis denotes a profession.

- (5) a. /'druk/ / [ə]r/<sup>St</sup><sub>'press operator'</sub> ><sup>S</sup><sub>der(Pattern 2)</sub> /'druk/ / [ə]r/ /'ai/<sup>St</sup><sub>'print shop'</sub>  
b. /'druk[ə]r/<sup>W</sup><sub>'press operator'</sub> >><sup>S</sup><sub>der(Pattern 2)</sub> /,druk[ə]'rai/<sup>W</sup><sub>'print shop'</sub>

##### *Deverbal profession nouns*

Lexical units like *Druckerei* ('print shop'), *Näherei* ('needlecraft'), and *Schnellbügeleri* ('quick iron service') can be formed through derivation by means of Pattern 3.

##### *Pattern 3*

FM: deaccentuation and suffixation with (/ [ə]r/) /'ai/

PM: categorisation as {Sing-NStf}

LM: categorisation as {NounSt, Fem-NSt}

SM: building of a concept according to the scheme:

'institution for activities denoted by the basis'

FM: /'druk/ → /,druk/ / [ə]r/ /'ai/

PM: {Der-VStf} → {Sing-NStf}

LM: {VSt} → {NounSt, Fem-NSt}

SM: 'to print' → 'institution for printing'

##### *Restriction 3*

FR: The base form is an umlaut variant (if any in the base paradigm).

PR: The paradigmatic base categorisation contains Der-VStf or Der-VStfGr.

LR: The lexical base categorisation contains VSt or VStGr.

SR: The basis denotes a professional activity.

- (6) a. /'druk/<sup>St</sup><sub>'to print'</sub> ><sup>S</sup><sub>der(Pattern 3)</sub> /,druk/ / [ə]r/ /'ai/<sup>St</sup><sub>'print shop'</sub>  
b. /'druk[ə]n/<sup>W</sup><sub>'to print'</sub> >><sup>S</sup><sub>der(Pattern 3)</sub> /,druk[ə]'rai/<sup>W</sup><sub>'print shop'</sub>

### 3.2 Reciprocal motivation

#### *Deverbal meteorological nouns*

Lexical units like *Donner* ('thunder event'), *Flug* ('flight'), and *Überfall* ('raiding event') can be formed through conversion by means of Pattern 4.

#### *Pattern 4*

FM: initial accentuation  
PM: categorisation as {Sing-NStf}  
LM: categorisation as {NounSt, Masc-NSt}  
SM: building of a concept according to the scheme:  
    'event denoted by the basis'

FM: /'don[ə]r/ ↔ /'don[ə]r/  
PM: {Conv-VStf} ↔ {Sing-NStf}  
LM: {VSt} ↔ {NounSt, Masc-NSt}  
SM: 'to thunder' ↔ 'thunder event'

#### *Restriction 4*

PR: The paradigmatic base categorisation contains Conv-VStf.  
LR: The lexical base categorisation contains VSt.  
SR: The basis denotes a process or event.

- (7) a. /'don[ə]r/<sub>to thunder</sub><sup>St</sup> ><sub>conv(Pattern 4)</sub><sup>S</sup> /'don[ə]r/<sub>thunder event</sub><sup>St</sup>  
    b. /'don[ə]rn/<sub>to thunder</sub><sup>W</sup> >><sub>conv(Pattern 4)</sub><sup>S</sup> /'don[ə]r/<sub>thunder event</sub><sup>W</sup>

#### *Denominal meteorological verbs*

Lexical units like *donnern* ('to thunder') and *gewittern* (lit. 'to thunderstorm') can be formed through conversion by means of Pattern 5.

#### *Pattern 5*

FM: identity  
PM: categorisation as {Inf-VStf, Pres-VStf}  
LM: categorisation as {VSt}  
SM: building of a concept according to the scheme:  
    'process consisting of an occurrence of an entity denoted by the basis'

FM: /'don[ə]r/ ↔ /'don[ə]r/  
PM: {Conv-NStf} ↔ {Inf-VStf, Pres-VStf}  
LM: {NounSt, Masc-NSt} ↔ {VSt}  
SM: 'thunder event' ↔ 'process consisting of an occurrence of a thunder event'

#### *Restriction 5*

PR: The paradigmatic base categorisation contains Conv-NStf.  
LR: The lexical base categorisation contains NounSt.  
SR: The basis denotes an agentless event.

- (8) a. /'don[ə]r/<sub>thunder event</sub><sup>St</sup> ><sub>conv(Pattern 5)</sub><sup>S</sup> /'don[ə]r/<sub>to thunder</sub><sup>St</sup>  
    b. /'don[ə]r/<sub>thunder event</sub><sup>W</sup> >><sub>conv(Pattern 5)</sub><sup>S</sup> /'don[ə]rn/<sub>to thunder</sub><sup>W</sup>

## List of symbols

↪	formation means application
>	direct word-formation relation
>>	indirect word-formation relation
conv	conversion process
der	derivation process
<b>S</b>	unspecified spoken Modern German system
St	lexical stem
W	lexical word
'	primary lexical accent
,	secondary lexical accent
[ə]	epenthetic schwa
'...'	concept paraphrase

## List of categories

Conv-NStf	nominal conversion stem form
Conv-VStf	verbal conversion stem form
Der-NStf	nominal derivation stem form
Der-NStfGr	nominal derivation stem-form group
Der-VStf	verbal derivation stem form
Der-VStfGr	verbal derivation stem-form group
Fem-NSt	feminine nominal stem
Inf-VStf	infinitive verb-stem form
Masc-NSt	masculine nominal stem
NounSt	noun stem
NounStGr	noun-stem group
Pres-VStf	present-tense verb-stem form
Sing-NStf	singular nominal stem form
VSt	verb stem
VStGr	verb-stem group

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