

# Association for Linguistic Typology (ALT 2019)

**Cross-linguistic trends  
in grammaticalization scenarios:  
a preliminary quantitative assessment**

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**Pavia, Sept 06, 2019**



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# Grammaticalization 1

**The classical definition of Kuryłowicz (1965):**

**Grammaticalization consists in the increase of the range of a morpheme advancing from a lexical to a grammatical or from a less grammatical to a more grammatical status ...**

**Pathways:**

<b>(1) SOURCE</b>	<b>—————→</b>	<b>TARGET</b>
(i) Verb ‘want’		Future marker
(ii) Noun ‘face/front’		Prep: ‘in front of’
(iii) Demonstrative		Copula

# Grammaticalization 2

**What is the relation between form and meaning in grammaticalization?  
Two approaches (Narrog & Heine 2018):**

**(i) Parallel Reduction Hypothesis:**

**Form change parallels meaning change  
(coevolution of meaning and form).**

**Bybee & Dahl (1989), Bybee et al. (1994)**

**(ii) Meaning First Hypothesis:**

**Meaning change is primary and precedes form change in time.**

- **Context Model of Grammaticalization:**

**Heine et al. (1991), Heine (2018)**

- **Invited Inference Theory of Semantic Change:**

**Traugott & Dasher (2002)**

# Research questions

## **Question 1:**

**To what extent is there coevolution of meaning and form?**

**(Parallel Reduction Hypothesis vs. Meaning First Hypothesis)**

## **Question 2:**

**To what extent is there areal variation in grammaticalization?**

**(This question is rarely discussed: Bisang 2004, 2008, 2011,  
Narrog & Heine 2017, 2018)**

# On methodology

## Quantitative analysis:

There are not many analyses of this type:

- **1994: Bybee, Perkins and Pagliuca**
- **25 years later: 2019:**  
**MAInz GRAMmaticalization Project (MAGRAM)**
  - **Descriptive statistics**
  - **Correlation analysis**
  - **Logistic regression analysis (later, not reported here)**

**This task is enormous:**



**We see our project as a first step,  
looking at **the peak of the iceberg**. So,  
much more research will be needed.**

# The team

**MAGRAM**

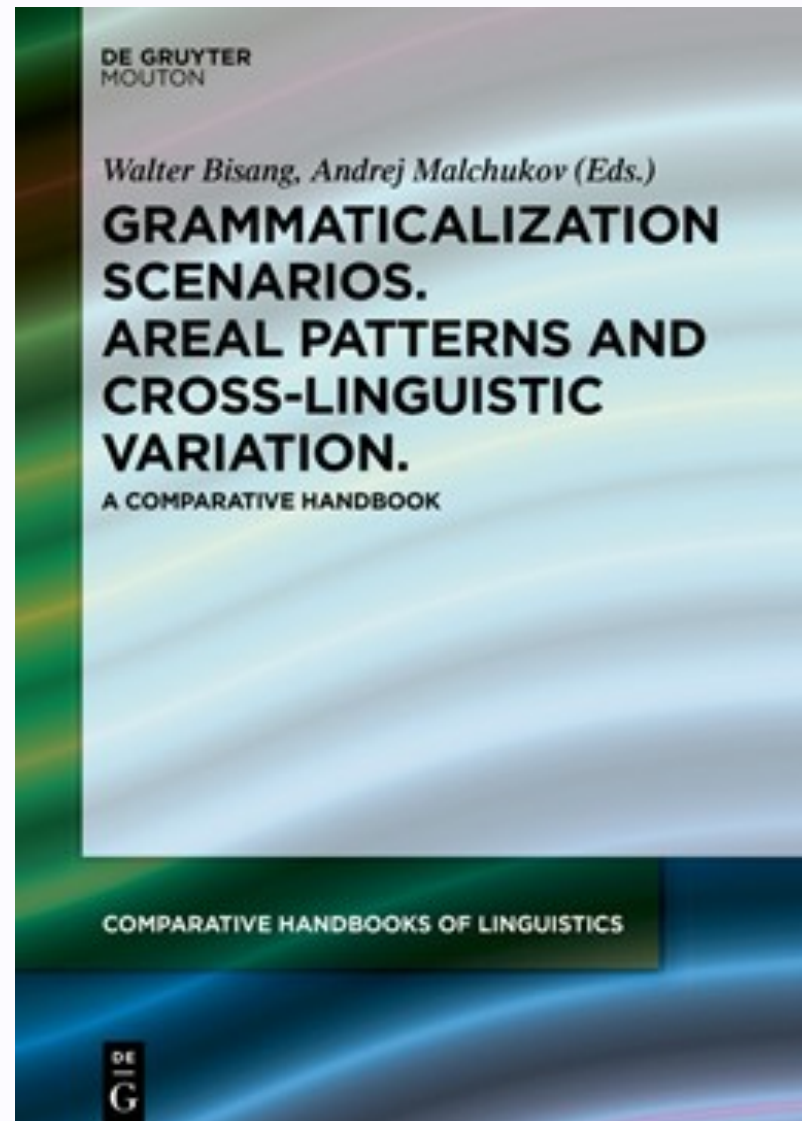
**is supported by the German Research Foundation (DFG):**

*Cross-linguistic variation in grammaticalization processes  
and areal patterns of grammaticalization*

**Members:**

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# The book



# Road map

- 1. Methodology**  
**(data collection,  
measuring grammaticalization)**
- 2. Coevolution of meaning and form**  
**(Question 1)**
- 3. Areality (Question 2)**
- 4. Discussion**
- 5. Conclusion**



**1.  
Methodology  
(data collection,  
measuring  
grammaticalization)**

# Data collection 1

**The conditions for collecting cross-linguistic data on grammaticalization differ from the general situation in linguistic typology in at least two ways:**

- **Grammaticalization is not equally well attested across the world's languages: Two reasons, which are often hard to disentangle:**
  - **Grammaticalization is of minor importance in a language.**
  - **There was grammaticalization but its effects can no longer be seen in the data as they are accessible today.**  
(e.g. agreement markers on verbs for which there is no longer any evidence of their origin)
- **Finding the data depends on experts in the field. Data are generally not available in reference grammars and it needs extensive experience in an individual language or language family to detect and measure pathways of grammaticalization.**

# Data collection 2

We asked experts of 29 individual languages, families or areas:

- (i) on the existing grammaticalization pathways in the languages of their expertise
- (ii) to write a book chapter on it (Bisang & Malchukov, forth).

**Occurrence of these languages/families/areas in Macro Areas:**

- **Africa:** Beja (Cushitic), Emai (Edoid), Manding, Tswana
- **Eurasia:** Chinese, German, Hindi, Iranian, Japhug, Korean, Lezgian, Romance, Slavic, Tungusic, Uralic, Yeniseian
- **SE Asia & Oceania:** Khmer, Malayo-Polynesian, Mori (W Malayo-Polynesian), Thai
- **Australia & New Guinea:** Ok (PNG), Nyulnyul (Austronesian)
- **North America:** Hoocak (Siouan), Iroquoian
- **South America:** Aymaran, Quechua, Southern Uto-Aztecan, Yucatec
- + **Pidgins & Creoles**

# Data collection 3

## List of languages/families/areas plus authors (part I):

- **Aymaran: Adelaar**
- **Beja (Cushitic, Afroasiatic): Vanhove**
- **Chinese (Sinitic, Sino-Tibetan): Sun & Bisang**
- **Creoles & Pidgins: Michaelis & Haspelmath**
- **Emai (Edoid, Niger-Congo): Schaefer & Egbokhare**
- **German (Indo-European): Kempf & Nübling**
- **Hindi (Indo-European): Montaut**
- **Hoocak (Siouan): Helmbrecht**
- **Iranian (Indo-European): Korn**
- **Iroquoian: Mithun**
- **Japhug (Gyalrong, Sino-Tibetan: ): Jacques**
- **Khmer (Austroasiatic): Bisang**
- **Korean: Rhee**
- **Lezgic (NE Caucasian): Maisak**

# Data collection 4

## List of languages/families/areas plus authors (part II):

- **Malayo-Polynesian (Austronesian): Himmelmann**
- **Manding (Mande, Niger-Congo): Creissels**
- **Mori (Western Malayo-Polynesian): Himmelmann**
- **Nyulnyulan (Non-Pamanyungan, Australian): McGregor**
- **Ok (Papua New Guinea): Fedden**
- **Quechua: Adelaar**
- **Romance (Indo-European): Cennamo**
- **Slavic (Indo-European): Wiemer**
- **Southern Uto-Aztecan: Estrada-Fernández**
- **Thai (Tai-Kadai): Bisang**
- **Tswana (Niger-Congo: Bantu): Creissels**
- **Tungusic (Transeurasian): Malchukov**
- **Uralic: Janhunen**
- **Yeniseian: Vajda**
- **Yucatec (Mayan): Lehmann**

# Measuring and Parameters 1

**Starting point: Lehmann (1995):**

**Autonomy of the linguistic sign (pp. 121–122):**

[T]he more freedom with which a sign is used, the more autonomous it is. Therefore the autonomy of a sign is converse to its grammaticality, and grammaticalization detracts from its autonomy. Consequently, if we want to measure the degree to which a sign is grammaticalized, we will determine its degree of autonomy.

# Measuring and Parameters 2

**Basis: Lehmann's (1995) six parameters:**

	Paradigmatic	Syntagmatic
Weight	Integrity	<del>Structural scope</del>
Cohesion	Paradigmaticity	Bondedness
Variability	Paradigmatic variability	Syntagmatic variability

**(1) Semantic reduction**  
**(2) Phonetic reduction**

**Plus:** **(7) Decategorization**  
**(8) Allomorphy**

# Measuring and Parameters 3

The 8 parameters are defined in a QUESTIONNAIRE (Chapter 2 of Bisang & Malchukov, forth):

- (1) Semantic Integrity (SI)
- (2) Phonetic Reduction (PR)
- (3) Paradigmaticity (PM)
- (4) Bondedness (BD)
- (5) Paradigmatic Variability (PV)  
(Obligatoriness)
- (6) Syntagmatic Variability (SV)  
(morpheme order)
- (7) Decategorization (DC)
- (8) Allomorphy (AM)

## Chapter 2

### Measuring Grammaticalization: A Questionnaire

Walter Bisang, Andrej Malchukov, Iris Rieder, Linlin Sun

#### 1. Grammaticalization Parameters

##### 1.1 Parameters: an overview

Our questionnaire measures grammaticalization in terms of eight parameters. The first six parameters correspond to Lehmann's (1995) parameters as summarized in Table 1:

	Paradigmatic	Syntagmatic
Weight	1. Semantic Reduction 2. Phonetic Reduction	Structural Scope
Cohesion	3. Paradigmaticity	4. Bondedness
Variability	5. Paradigmatic Variability	6. Syntagmatic Variability

Table 1: Parameters for measuring autonomy (Lehmann 1995)

The parameters as they are shown in Table 1 and as they are used in our questionnaire deviate from Lehmann's (1995) parameters in the following way:

- We split Paradigmatic Weight into the two logically independent parameters of Semantic Reduction (Loss of Semantic Integrity, desemanticization) and Phonetic Reduction (Loss of Phonetic Integrity, phonetic attrition).
- We do not use structural scope because it proved to be theoretically and empirically most challenging (cf Tabor and Traugott 1998; Lehmann 2004; Diewald 2011).

We add the following two parameters, which are frequently discussed in the literature on grammaticalization:

- Parameter 7: Decategorization (cf. Hopper and Traugott 2003)
- Parameter 8: Allomorphy (thus, we single out allomorphy from paradigmaticity, parameter 3)

Additional remarks on our methodology:

1. The above eight parameters are **logically independent**. Even if all of them instantiate loss of autonomy in Lehmann's (1995) framework, there does not seem to be covariation in the sense that the change of one parameter automatically entails the change of all other parameters. In fact, this project expects interesting cross-linguistic variation. Thus, the extent to which there are correlations and the extent to which these correlations are subject to cross-linguistic variation will be one of the results of our database.
2. There are **four values** for each parameter, starting from 1 for "lowest value" to 4 for "highest value". The details will be explained separately for each parameter in the next subsection (§ 1.2).
3. In principle, these values can be assigned to a linguistic sign in an **absolute** and in a **relative** way:



# Measuring and Parameters 4

For each of these parameters, we distinguish 4 different values with **increasing loss of autonomy from 1 to 4**.

Starting out from pathways of the following type:

**SOURCE**  $\longrightarrow$  **TARGET**

- Calculation of values [1, 2, 3, 4] for parameters (1) to (8) for each TARGET
- Value difference between SOURCE and TARGET:
  - If no change: [-]
  - If there is change: [+]

# Measuring and Parameters 5

**Number of paths of grammaticalization: 1.001**

**Number of data points from combination of TARGET values plus change values for each of the eight parameters:**

- **Number of parameter values for TARGETS [1, 2, 3, 4]: 8.008**
- **Number of change values [+]/[-]: 8.008**

**Total of data points: 16.016**

**=====**

# Measuring and Parameters 6

## Parameter (1): Semantic Integrity (SI)

**Value 1:** The linguistic sign has a lexical meaning.

**Value 2:** The linguistic sign has an abstract meaning, which is referential/denotational rather than relational.

**Value 3:** The linguistic sign has an abstract non-denotational / non-referential meaning.

**Value 4:** The linguistic sign has syntactic function.  
E.g. it has become a case marker.

**A good illustration: pathway from body-part > case marker (Lehmann 1995, Heine & Kuneva 2002):**

(1) head	>	top	>	on	>	case marker
1		2		Semantic		Syntactic
				Case		Case

# Measuring and Parameters 7

## Parameter (2): Phonetic Reduction (PR)

**Value 1:** The linguistic sign consists of two or more syllables  
Engl.: *gonna* ‘Future marker’.

**Value 2:** The linguistic sign is (i) a monosyllabic word or  
(ii) full syllable with no word status.

On (i): Chinese FUT marker *yào*,

On (ii): Turkic *-yor-* in *gel-i-yor-um* ‘I come’.

**Value 3:** The linguistic sign is a sub-syllabic morpheme.  
Plural suffix *-m* in Chinese pronouns in rapidly  
spoken discourse *ta-m* [3.PERS-PL] ‘they’.

**Value 4:** The linguistic sign is reduced to a suprasegmental  
feature (**tone**) or is lost as a **zero-marker** in a morpho-  
logical paradigm.

# Measuring and Parameters 8

## Parameter (3): Paradigmaticity (PM) (Paradigmatic cohesion)

**Value 1:** The linguistic sign belongs to a major (open) word class: N, V, A.

**Value 2:** The linguistic sign is an element of a minor (closed) word class: P, Conjunction, Classifier, Aux, Pron, ...

**Value 3:** The linguistic sign expresses a grammatical category but is not fully paradigmatic.

**E.g. Auxiliaries analytic paradigms for tense:**

**Spanish:**

**1.SG:** *he mandado* 'I have sent'

**2.SG:** *has mandado* 'you have sent'

**3.SG:** *ha mandado* 'he has sent', etc.

# Measuring and Parameters 9

## Parameter (3): Paradigmaticity (PM) (Paradigmatic cohesion)

**Value 4:** The linguistic sign is a member of a small and homogeneous paradigm (paradigm below, plus reduced paradigms like binary systems with a  $\emptyset$ -marker).

**A prototypical paradigm: Spanish *mandar* ‘send’, Present:**

1.SG	<i>mand-o</i>	1.PL	<i>mand-a-mos</i>
2.SG	<i>mand-a-s</i>	2.PL	<i>mand-á-is</i>
3.SG	<i>mand-a-<math>\emptyset</math></i>	3.PL	<i>mand-a-n</i>

# Measuring and Parameters 10

## **Parameter (6): Syntagmatic Variability (SV) (Morpheme order)**

**Value 1: Word order is not constrained.**

**Value 2: The position of the linguistic sign is more constrained but syntactically transparent.**

**Value 3: The linguistic sign is assigned to a position which is no longer transparent.**

**Value 4: The linguistic sign becomes bound (has a morphologically fixed position within a paradigm).**

# Measuring and Parameters 11

The structure of our database:

Screenshot of a contribution to our database on Manding  
(Creissels, forth)

Language	Source	Source meaning	Target	Target meaning	Semantic integrity	Phonetic reduction	Paradigmaticity	Bondedness	Paradigmatic variability	Syntagmatic variability	Decategorization	Allomorphy
Mandinka	<i>bán-tá</i>	'finish' (+ COMPLETIVE)	<i>bárá ~ bádá</i> ( <i>Maninka-mori</i> )	PERFECT predicative marker	+3	-1	+4	-1	+4	+3	+4	-1
Mandinka	<i>bán</i>	'finish'	<i>bán</i>	'already' (particle in postverbal position)	+3	-2	+3	-1	-1	+3	+4	-1
Mandinka	<i>bín</i>	'fall'	<i>bín</i>	INCHOATIVE AUX	+3	-2	+2	-1	-1	+2	-1	-1
Mandinka	<i>kánáa</i> ( <i>Bm káná , Koy ká</i> )	'come'	<i>kánáa</i> ( <i>Bm káná , Koy ká</i> )	PROHIBITIVE marker	+3	-1	+4	-1	-1	+3	-1	-1
Mandinka	<i>ná</i>	'come'	<i>ná</i>	FUTURE	+3	-2	+4	-1	+4	+3	+4	-1
Mandinka	<i>kó</i>	'say'	<i>kó</i>	COMPLEMENTIZER	+3	-2	+2	-1	-1	+2	-1	-1
Mandinka	<i>mé`n / mìn</i>	DEMONSTRATIVE	<i>mé`n / mìn</i>	RELATIVIZER	+3	-2	-2	-1	-1	-1	-1	-1
Mandinka	<i>náa jáy</i>	'come here'	<i>náy</i>	centripetal marker	+2	+2	+3	-1	-1	+3	+4	-1
Mandinka	<i>yé</i>	'see, look' (IMP)	<i>yé</i>	COPULA	+2	-2	+2	-1	-1	-1	+4	-1



**2.**  
**Coevolution**  
**of**  
**meaning and form**  
**(Question 1)**

# Meaning/form coevolution 1

- The combination of change values ([+] for change vs. [-] for no change) of all 8 parameters yields individual patterns of parameter change values.
- The combination of 8 parameters with two values ([+] vs. [-]) results in a total of  $2^8 = 256$  patterns of the type [+ - + - - + + -].
- We checked the frequency of the individual patterns within the total of the 1.001 pathways.

# Meaning/form coevolution 2

## Frequency of individual change patterns in set A:

	Parameter.change
no. of pathways	1001
no. of parameters	8
possible parameter values	+ / -
no. of possible combinations of parameter values	256
no. of combinations of parameter values attested in the dataset	98
no. of combinations of parameter values which account for __% of the pathways	
20.9%	1
31.9%	2
49.5%	5
75.3%	17

### Results:

**256 possible combinations, 98 are attested (38.3%).**

**There is a small number of very frequent patterns:**

**The 5 most frequent patterns represent 49.5% of all 1.001 pathways.**

**75.3% of the pathways belong to only 17 patterns.**

## Meaning/form coevolution 3

	SI	PR	PM	BD	PV	SV	DC	AM
1. 20.88%	+	-	+	-	-	+	+	-
2. 10.99%	+	-	+	-	-	+	-	-
3. 9.59%	+	-	+	-	+	+	+	-
4. 4.1%	+	-	+	-	+	+	-	-
5. 3.9%	+	-	+	+	+	+	+	-

### Results:

- The consistency of [+] values for **Semantic Integrity (SI)** is to be expected from the perspective that more grammatical categories come with more abstract meaning.
- Two additional parameters with consistent [+] values: **Paradigmaticity (PM)**, **Syntagmatic Variability (SV)**.
- Two parameters consistently show no change: **Phonetic Reduction (PR)**, **Allomorphy (AM)**.

# Meaning/form coevolution 4

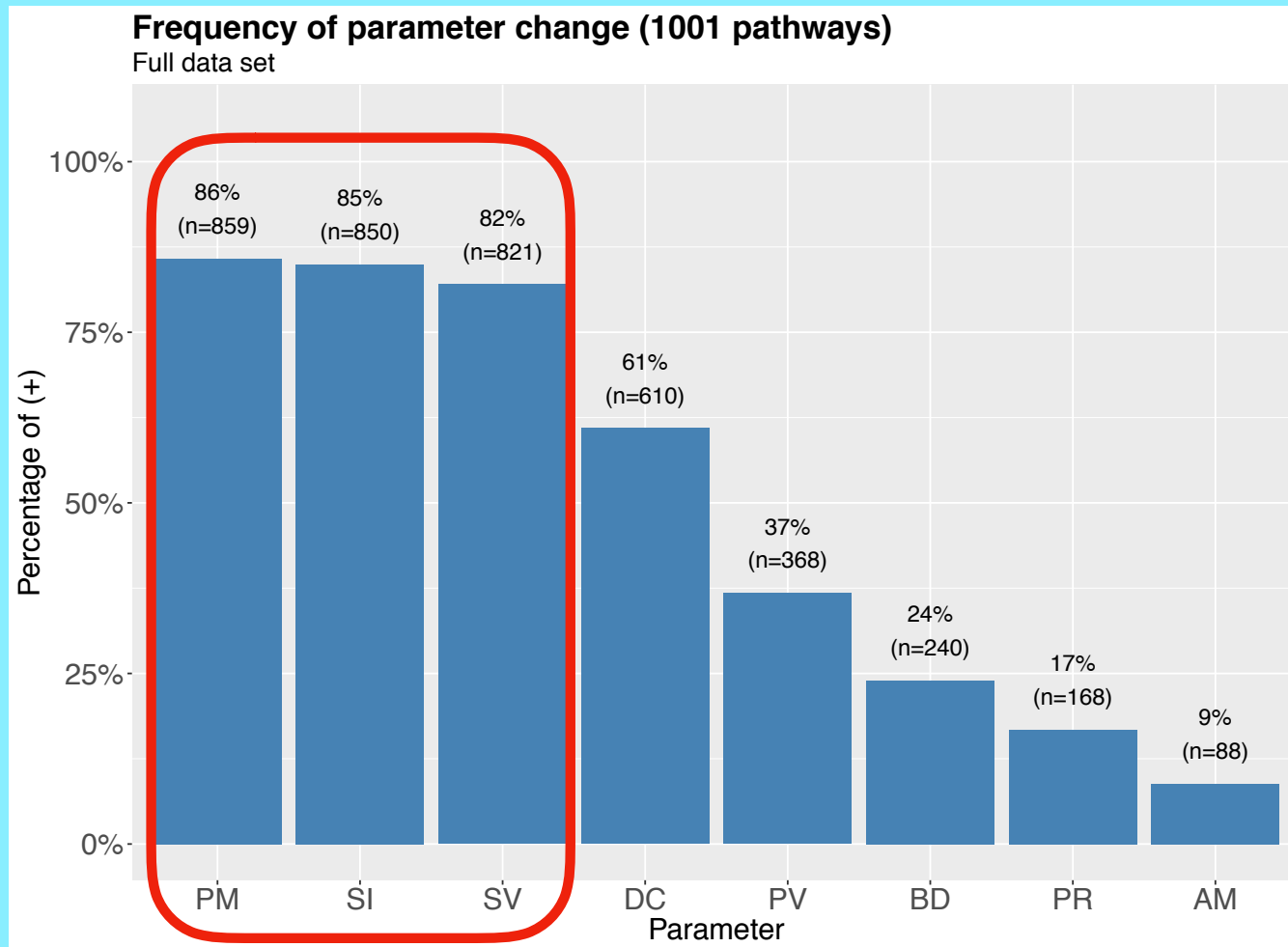
**Consistent [+] values: Semantic Integrity (SI)  
Paradigmaticity (PM)  
Syntagmatic Variability (SV)**

**Consistent [-] values: Phonetic Reduction (PR)  
Allomorphy (AM)**



**A look at the change ratio of individual parameters shows a similar distribution:**

# Meaning/form coevolution 5



## Results:

The parameters with the highest frequency of value change (more than 80% of [+] values) are (in addition to **Semantic Integrity (SI)**):

- **Paradigmaticity (PM)**
- **Syntagmatic Variability (SV)**

The other parameters steadily decrease from **DC > PV > BD > PR > AM**.

**SI: Semantic Integrity, PR: Phonetic Reduction, PM: Paradigmaticity, BD: Bondedness, PV: Paradigmatic Variability (Obligatoriness), SV: Syntagmatic Variability (Morpheme Order), DC: Decategorization, AM: Allomorphy.**

# Meaning/form coevolution 6

**Interim summary:**

**The results so far show that there is no general covariation of meaning and form. The Parallel Reduction Hypothesis is too coarse-grained.**

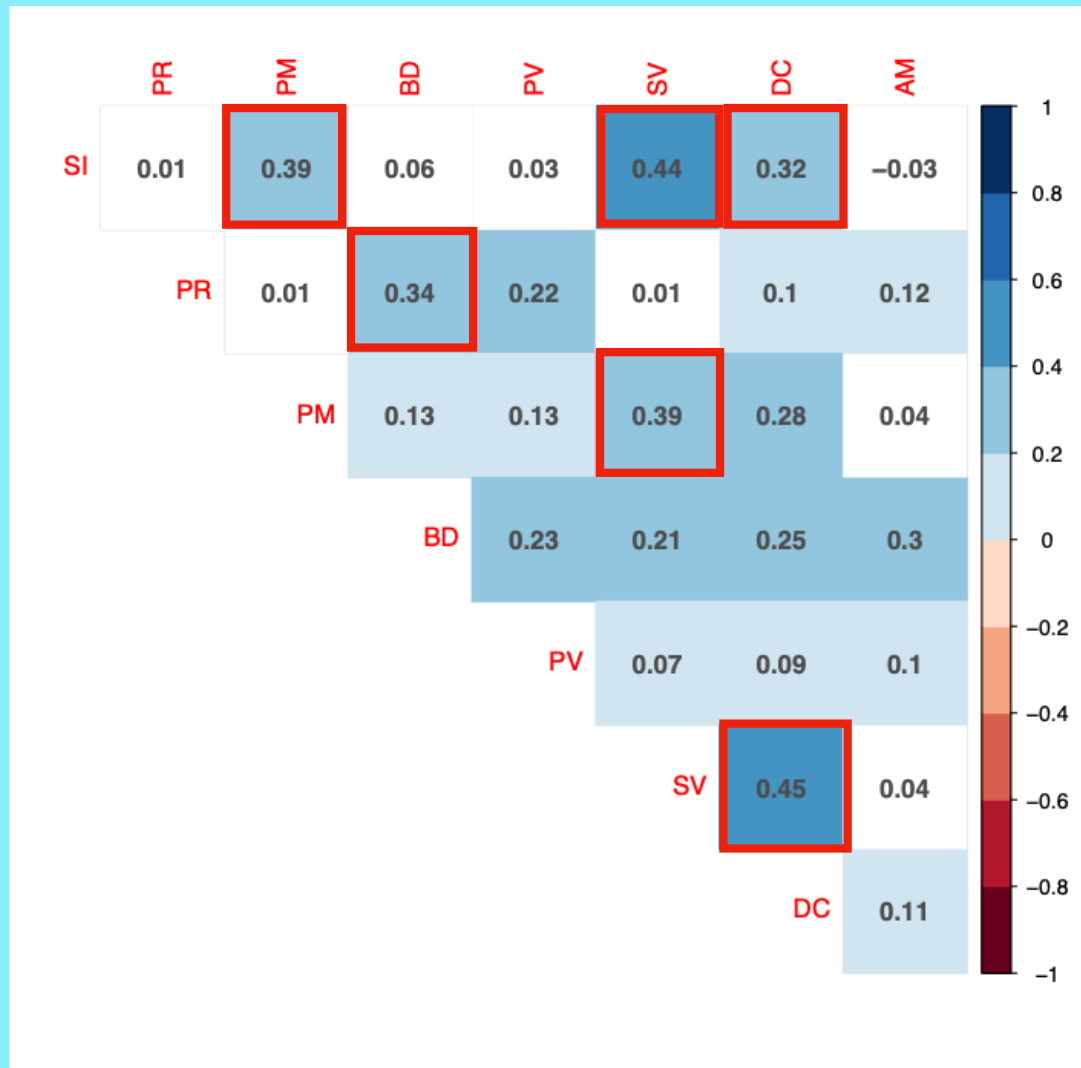
**If we take Semantic Integrity (SI) as the meaning side of grammaticalization, there are only two parameters with similarly high frequencies:**

- **Paradigmaticity (PM)**
- **Syntagmatic Variability (SV)**

**The other parameters steadily decrease down to AM.**

# Meaning/form coevolution 7

**Heatmap:** Rank correlations for [+] / [-] values of parameters with Kendall's tau > 0.30 (medium magnitude of effect size):



The red-framed combinations show change in the same direction:  
If there is (no) value change in parameter X, there is also (no) change in parameter Y.

p-value:  $p < .001$

Generally, the results in the coloured fields show p-value < .05



# Meaning/form coevolution 8

**Correlations associated with change in meaning (i.e. **SI**) (form/meaning coevolution):**

**SI / SV: tau = 0.44**

**SI / PM: tau = 0.39**

**SI / DC: tau = 0.32**

**Correlations between parameters of mainly formal character:**

**SV / DC: tau = 0.45**

**PM / SV: tau = 0.39**

**PR / BD: tau = 0.34**

**SI: Semantic Integrity, PR: Phonetic Reduction, PM: Paradigmaticity, BD: Bondedness, PV: Paradigmatic Variability (Obligatoriness), SV: Syntagmatic Variability (Morpheme Order), DC: Decategorization, AM: Allomorphy.**

# Meaning/form coevolution 9

Absence of meaning/form correlations:

**SI / Bondedness:**  $\tau = 0.06$

**SI / Phonetic reduction:**  $\tau = 0.04$

**SI / Paradigmatic variability:**  $\tau = 0$

**SI / Allomorphy:**  $\tau = 0$

# Meaning/form coevolution 10: Summary

(i) There is no general form/meaning covariation but there seems to be covariation with certain parameters:

- **Paradigmaticity (PM)**
- **Syntagmatic Variability (SV)**
- **Decategorization (DC)**

**Bondedness (BD)**, **Phonetic Reduction (PR)** and **Allomorphy (AM)** are of minor importance. **Decategorization (DC)** shows covariation with Kendall's tau and **Paradigmatic Variability (PV)** takes an intermediate position:

(4) Parameter sequence:

**[SI, PM, SV] > DC > PV > [BD, PR, AM]**

(ii) The interaction between parameters is more complex than generally assumed in Meaning First approaches. There are chains of dependencies between individual parameters.

**3.**  
**Areality**  
**(Question 2)**

# Areality 1

## Comparison of two macro-areas:

### **Africa:**

**246 pathways from:**

- **Beja (Cushitic)**
- **Emai (Edoid)**
- **Manding**
- **Tswana**

### **Eurasia:**


**571 pathways from:**

- **Chinese**
- **German**
- **Hindi**
- **Iranian**
- **Japhug**
- **Khmer**
- **Korean**
- **Lezgif**
- **Romance**
- **Slavic**
- **Thai**
- **Tungusic**
- **Uralic**
- **Yeniseian**

## Areality 2

As for the number of overlapping categories, we get the following figures (x = shared patterns,  $\emptyset$  = not shared patterns)

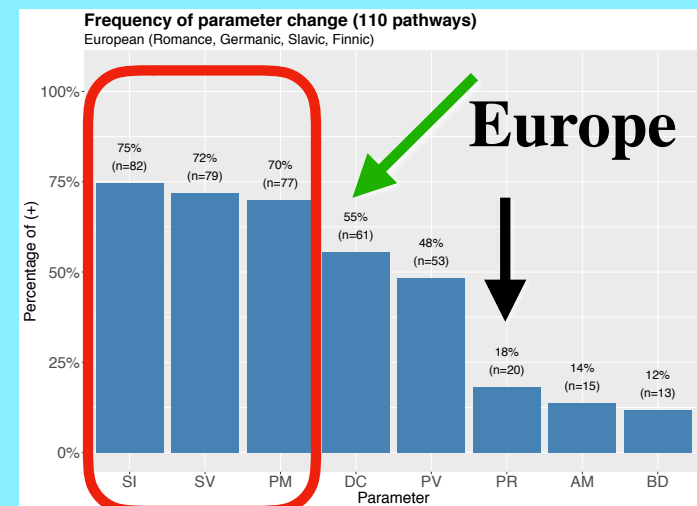
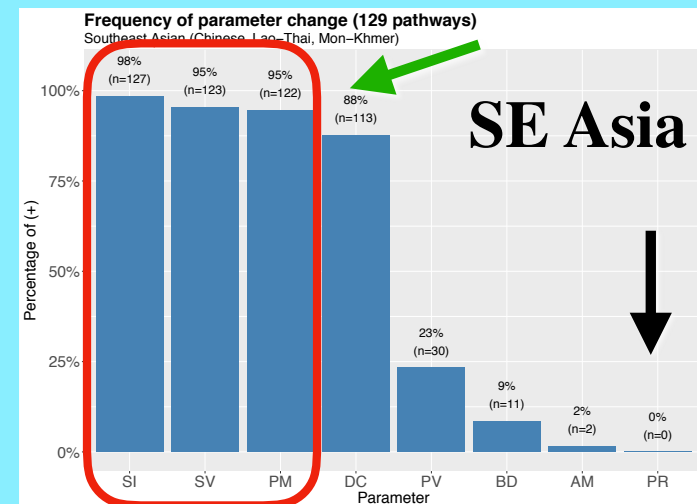
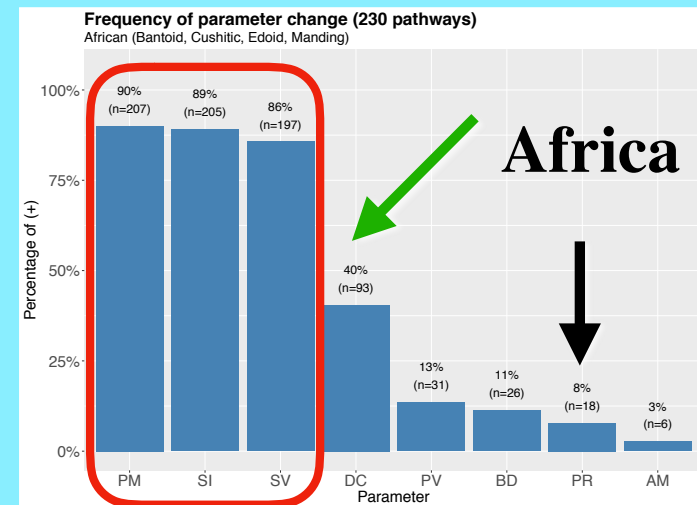
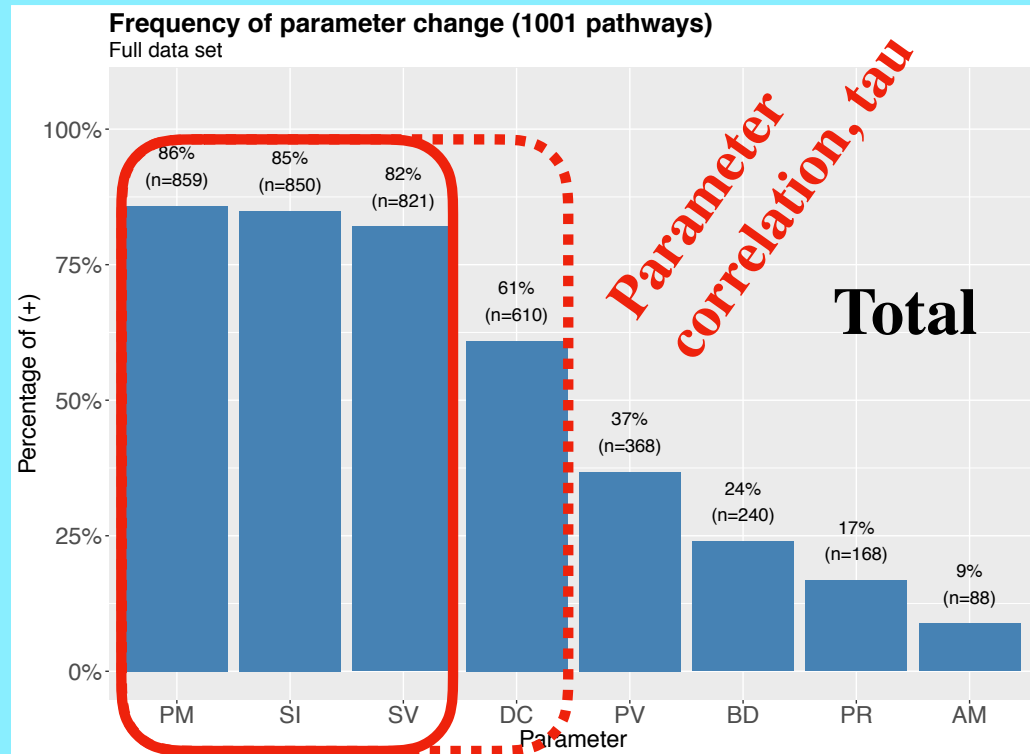
Area (Number of	Eurasia (571)	Africa (246)
<b>N = 32</b>	<b>x</b>	<b>x</b>
<b>N = 45</b>	<b>x</b>	<b><math>\emptyset</math></b>
<b>N = 7</b>	<b><math>\emptyset</math></b>	<b>x</b>
<b>N = 172</b>	<b><math>\emptyset</math></b>	<b><math>\emptyset</math></b>

 Our calculations show that the differences in the frequency of occurrence of [+]/[-] parameter patterns in the macro-areas of Eurasia and Africa (number of attested/non attested patterns) is significant:

Chi-square test:  $X^2(1) = 16.09474, p < .001$

# Areality 3

## Parameter change: [+] vs. [-]:



### Results:

- Consistently highest frequencies of change for SI, PM, SV in all three areas.
- Areal differences for frequencies of change for DC and PV.
- Smallest importance of BD, AM, PR.
- SE Asia: Smallest percentage for PR.

## Areality 4

These results basically confirm the decrease in importance found in the context of [+]/[-] change patterns.

They additionally show areal variation in **the intermediate area of DC and PV**:

(4) Parameter sequence:

[SI, PM, SV] **> DC > PV >** [BD, PR, AM]

**Areal variation**

This cline is similar to Narrog & Heine's (2018: 2) cline of increasing cross-linguistic covariation:

(5) Extension > Desemant. **> Decategorialization >** Erosion



4.

# Discussion

# Meaning/form coevolution 1

**Parallel Reduction Hypothesis vs. Meaning First Hypothesis.**

**What can we learn from current models?**

**On the **Parallel Reduction Hypothesis**:**

**To the extent that our dataset is representative, it indicates that this approach is much too coarse-grained. Many parameters simply don't vary prominently with semantic change to more grammatical meaning (BD, PR, AM).**



**So, to what extent can models based on the **Meaning First Hypothesis** account for phenomena of grammaticalization?**

# Meaning/form coevolution 2

**Our results fit better with the Meaning First Hypothesis (MFH) (e.g. Heine 2002, Traugott & Dasher 2002).**

**→ But models based on the MFH do only partially integrate later form-based changes which follow the pragmatics-driven stage.**

**PR: Subsyllabic morphemes, zero-markers**

**PM: Members of fully integrated paradigms**

**BD: Agglutinative affixes, *porte-manteau* morphemes**

**PV: Obligatory markers, ...**

**More generally,**

**→ we clearly need models which go beyond the meaning/form hypothesis: nets/chains of dependencies between individual parameters.**

# Meaning/form coevolution 3

The high values of the parameters at the lower end of the parameter sequence may be partially due to frequency effects (e.g. Phonetic Reduction, Bondedness).

But one can also observe **formal change before functional change**, i.e., formal reanalysis before functional reanalysis:

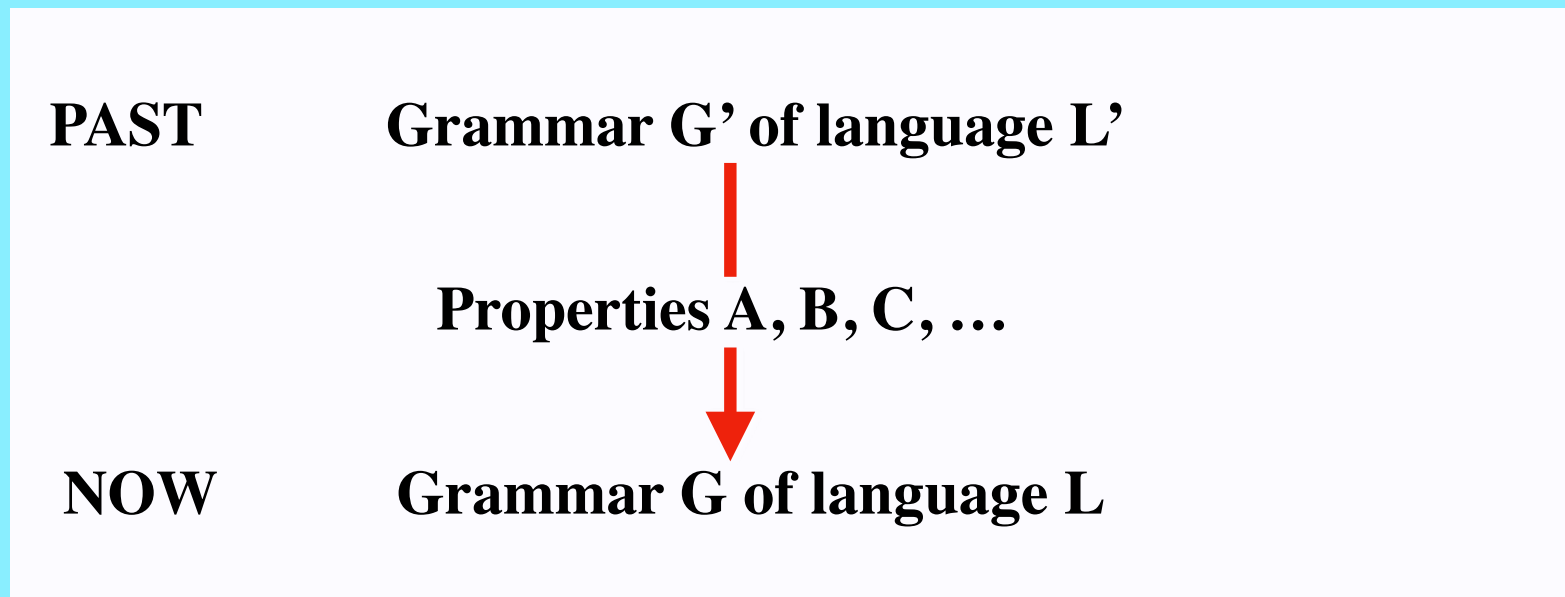
- Iroquoian (Mithun): Fusion before grammaticalization
- Postposed articles in Germanic (Kempf & Nübling)

# Meaning/form coevolution / Areality 1

**A simple fact**

**(rarely taken seriously in grammaticalization research):**

**At any moment of change, grammaticalization always interacts with the particular formal properties that currently exist in a language:**



# Meaning/form coevolution / Areality 2

**Therefore,**

**at least the following factors and their realization at the SOURCE level may affect the outcome of the parameter values of the TARGET:**

- **Phonological properties**  
(Schiering 2006: stress-based phonology, syllable-based phonology, mora-based phonology; Ansaldo & Lim 2004, Bisang 2008)
- **Morphological typology** (agglutinative, inflectional, polysynthetic [extensive template structures])
- **Word-order typology** (prefixation/suffixation — different degrees of fusion)

# Meaning/form coevolution / Areality 3

## Continued:

- **Competing motivations of explicitness vs. economy (vonder Gabelentz 1891, Haiman 1983, Optimality Theory): Particularly in terms of prominence of pragmatic inference (Bisang 2009, 2015 on hidden vs. overt complexity and East and mainland Southeast Asian languages).**
- **Degree of transparency to processes of grammaticalization:  
Verbal domain is less transparent: Quechua, Tungusic  
Nominal domain is less transparent: Beja (Cushitic),  
Nyulnyulan (Australian)**

**5.**  
**Conclusion**  
**(short)**



# Summary

**Evidence from our MAGRAM project:**

- (i) The general assumption that there is coevolution of meaning and form is too simple:**
  - **One needs to check for individual parameters.**
  - **There are form-based processes of change with their inter-dependencies which operate at later levels of grammaticalization.**
- (ii) There are areal specificities of grammaticalization.**

**Future research:**

- 1. Finish our volume**
- 2. Expansion of our database**
- 3. Expansion of our descriptive statistical analysis plus correlation analysis (heatmap) to logistic regression analysis**
- 4. Making our data available on CLLD  
(Cross-Linguistic Linked Data)**

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Grazie! Teşekkürler!

谢谢

ขอบคุณ!

Thank you!

សូមអរគុណ។

Danke!

ありがとう



Pavia, Sept 06, 2019

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