

What you see is not what you get: Implicational universals in diachronic perspective

Sonia Cristofaro

University of Pavia

Implicational universals

Implicational universals

One of the most important results of typological research: Implicational universals of the form

$$A \rightarrow B$$

These are empirically established generalizations describing cross-linguistic **distributional correlations** between particular grammatical phenomena A and B, such that A usually occurs when B also occurs, whereas B occurs also in the absence of A.

Implicational universals

This encompasses three language types, (i) A and B both present, (ii) B present but A absent, (iii) A and B both absent, whereas languages do not usually have (iv) A present but B absent.

	A	$\sim A$
B	(i) yes	(ii) yes
$\sim B$	(iv) no	(iii) yes

Table 1: The distributional patterns described by implicational universals

Implicational universals

These distributions are widely assumed to reflect **corresponding organizational principles of language pertaining to A and B**, in the sense of principles whereby A should only occur where B also occurs, whereas B can occur independently.

The distributional correlation between A and B, then, is reproduced at the explanatory level: implicational universals are treated

- both as **descriptions of particular distributions**
- and as descriptions of **corresponding principles of causation** that give rise to those distributions.

Implicational universals

For example:

$NG \rightarrow NRel / RelN \rightarrow GN$

When possessors are postposed ('The house **of John**'), relative clauses are usually also postposed ('The house **that they bought**'); equivalently, when relative clauses are preposed ('**that they bought** the house'), possessors are usually also preposed ('**John's** house': Dryer 2007, among others).

	NG	GN
NRel	(i) yes	(ii) yes
RelN	(iv) no	(iii) yes

Table 2: $NG \rightarrow NRel$

Implicational universals

This correlation has been accounted for in terms of processing preferences related to the head-modifier structure of relative clause constructions and possessive constructions (Hawkins 1983, 1994, 2004, 2014; Dryer 1992).

- Relative clauses and possessors are modifiers. When modifiers are preposed to their heads (RelN, GN: 'that we bought the house', 'John's house'), they must be held in working memory till the head is recognized.
- More structurally complex modifiers, such as relative clauses, place a heavier burden on working memory and lead to a longer delay in head recognition than less structurally complex modifiers, such as possessors.

Implicational universals

- This determines general processing preferences for postposed relative clauses (NRel) over postposed possessors (NG), and preposed possessors (GN) over preposed relative clauses (ReIN).
- Because of these preferences, (i) postposed possessors should only occur when postposed relative clauses also occur ($NG \rightarrow NRel$), and (ii) preposed relative clauses should only occur when preposed possessors also occur ($ReIN \rightarrow GN$).
- **The distributional correlation** between particular possessor orders and particular relative clause orders, then, is assumed to mirror a **corresponding principle of causation pertaining to these orders**, so that the implicational universal can be used to describe both.

Implicational universals

- This view of implicational universals is based on **the synchronic properties** of the relevant grammatical phenomena, not **the diachronic processes** that give rise to these phenomena in individual languages.
- For example, processing explanations of word order correlations are based on synchronic properties of the syntactic configurations resulting from these orders (the relative processing ease of these configurations), irrespective of how these orders actually arise diachronically from one language to another.

Diachrony

But:

- Typologists generally assume that the distributional patterns described by implicational universals are shaped by diachronic processes that give rise to the relevant phenomena cross-linguistically (Greenberg 1969, 1978; Givon 1975, 1979; Bybee 1988, 2006, 2008, 2009; Aristar 1991; Newmeyer 1998, 2005; Anderson 2005, 2016; Evans and Levinson 2009, Cristofaro 2011).
- This is distinct from language universals in the generative sense of universal grammatical components that operate in a speaker's synchronic production of individual constructions.
- In principle, then, explanations for the distributions should be based on these processes, rather than the resulting distribution in itself (Bybee 1988, 2006, among others).

'As traditionally understood, universals of language are cross-linguistic generalizations concerning synchronic grammars [...] It stands to reason, however, that any synchronic pattern must have a diachronic dimension, since that pattern had to come into being in some way [...] we cannot be sure of the validity of a functional explanation for a synchronic universal unless we can confirm that that functional consideration was applicable in the formation of the synchronic pattern.' (Bybee 2006: 179)

So what happens if we look at **the diachronic processes** that give rise to the distributions described by implicational universals?

- Cross-linguistic evidence about these processes is bound to be quantitatively limited.
- The available evidence, however, poses three qualitative challenges for traditional interpretations of implicational universals of the type $A \rightarrow B$.

Diachrony

- (i) **Synchronic correlations between A and B may be spurious:** there actually is no distributional evidence to posit the correlation, but this is only apparent at the diachronic level.
- (ii) **No overarching principle of causation pertaining to A and B in themselves:** (Non-spurious) synchronic correlations between A and B emerge over time as a possibly combined result of several other possible correlation or frequency patterns, which need not be motivated by principles pertaining to A and B in themselves, nor by a single principle.
- (iii) **The synchronic distribution of A and B is not relevant to explaining the synchronic correlation between the two:** The various patterns that give rise to the synchronic correlation between A and B should be identified and accounted for in their own right, and this cannot be done based on the synchronic distribution of A and B anyway.

**Synchronic correlations may be
spurious**

Synchronic correlations may be spurious

NG \rightarrow NRel/ ReIN \rightarrow GN: Can we really posit a correlation between particular possessor orders and particular relative clause orders based on **the synchronic distribution** of these orders?

In a number of cases where relative clauses and possessors have the same order (both preposed or both postposed), the relative clause construction and the possessive construction continue the order of a third construction that gave rise to both, often an appositional construction ('X, **the one** Y VERBs', 'X, **the one** (of) Y > 'The X **that** Y VERBs', 'The X **of** Y'; 'The **thing** Y VERBs, X', 'The **thing** (of) Y, X' > 'The X **that** Y VERBs', 'The X **of** Y': Aristar 1991, among others).

Synchronic correlations may be spurious

(1) Bilin (Cushitic)

(a) *'aqwa ja'ag-na-x^w-əl*

water drink-1PL-**M.REL**-to

'to water that we do not drink' (originally 'to water, **the one** (that) we do not drink': Aristar 1991: 13)

(b) *ti'idad adäri-x^w-əd*

order lord-**M.GEN**-DAT

'by the order of the lord' (originally 'by the order, **the one** of the lord': Aristar1991: 13)

Synchronic correlations may be spurious

(2) Anywa (Nilotic)

(a) *wīllé* **mū**-*ā-tòyó* *ā-wét-ā*
bottle.PL **REL**-PAST-break PAST-throw.away-1SG

'I threw the broken bottles away.' (originally 'I threw the bottles, **the** broken **ones**, away': Reh 1996: 406)

(b) /'ùuDí **mū** *āḥwàaé/*
house.PL **POSS.PL** Anywa.PL

'the houses of the Anywas' (originally, 'the houses, **the ones** (of) the Anywas': Reh 1996: 155)

Synchronic correlations may be spurious

(3) Newari (Tibeto-Burman)

(a) *ji-nə* *nyan-a-mha* *nya*
1SG-ERG buy-PAST-NMLZ/REL fish

'The fish **that** I bought' (originally 'the **thing** I bought, a fish':
DeLancey 1986, 2002: 60)

(b) *ra:m-ya:-mha* *khica:*
Ram-GEN-NMLZ/POSS dog

'Rham's dog' (originally 'Ram's **thing**, a dog': DeLancey 1986,
2002: 61)

Synchronic correlations may be spurious

(4) Middle Chinese

(a) *liao wan bing di iao*
cure ten.thousand sickness **REL** medicine

'a medicine **that** cures all sickness' (originally '**the one** (that) cures ten thousand sickness, medicine', or 'cures ten thousand sickness, **this** medicine': Yap, Choi and Cheung 2010: 77-9)

(b) *wo di xue wen*
1SG **GEN** knowledge

'my knowledge' (originally, '**my one**, knowledge' or 'me, **this** knowledge': Yap, Choi and Cheung 2010: 77-9)

Synchronic correlations may be spurious

In other cases where relative clauses and possessors have the same order (both preposed or both postposed), the relative clause construction has been argued to be derived from a possessive construction.

(5) Classical Tibetan (Tibeto-Burman)

bcad-pa-'i *shing*
cut-NOMLZ-GEN tree

'the tree **that** has been cut' (literally 'the tree **of** cutting': DeLancey 1999: 233)

(6) Akkadian (Semitic)

tuppi *addin-u-šum*
tablet.of I.gave-SUBJ-to.him

'the tablet **that** I gave to him' (originally 'the tablet **of** my giving': Deutscher 2001: 410)

Synchronic correlations may be spurious

In all of these cases, relative clause constructions and possessive constructions originate as one and the same construction, either because they are derived from the same source, or because they are derived from one another. Relative clause order and possessor order, then, **are not actually distinct**.

Synchronic correlations may be spurious

- Similar facts have been reconstructed for other word order correlations, for example adposition order and possessor or verb-object order, or relative clause order and adjective order (Givón 1975, 1979, 2001; Bybee 1988; Aristar 1991; Dryer 2006).
- Word order correlations, however, can only be posited when the relevant orders are really distinct, in the sense that they originate through separate processes that could be correlated.
- Cases where the two orders originate as one and the same order, then, are not relevant to posit the correlation.
- Once these cases are taken out, the remaining cases where the two orders co-occur may or may not be enough to posit a correlation between the two, meaning that an observed synchronic distributional correlation may be spurious.

Synchronic correlations may be spurious

	RelN	NRel
GN	128	161
NG	2	328

Table 3: Relative clause order and possessor order (Dryer 2013a, 2013b)

- In this table, the cases where relative clauses and possessors are both preposed or both postposed considerably outnumber those where relative clauses are preposed but possessors are postposed.
- This might be taken as evidence for a distributional correlation between preposed relative clauses and preposed possessors, or postposed possessors and postposed relative clauses.
- Out of the cases where these orders co-occur, however, only the ones should be considered where they originate through separate processes, and these may or may not be enough to posit the assumed correlation.

Synchronic correlations may be spurious

In order to identify non-spurious correlations between word orders, then, the cases should be identified where these orders originate independently. Sometimes there is direct diachronic evidence of this.

(7) Tswana (Niger-Congo)

- (a) *mù-sádi* **jó** [!]ú-òpélà- 'η
CL1-woman-CSTR **CL1:LK** S.CL1-sing:PRS-REL
[!]jó-lé
CL1:DEM-DIST

'That woman who is singing' (relative clause has a linker derived from a demonstrative: Creissels 2017: 12)

- (b) *b-àná* **b-áχà** *kítsó*
CL2-child **CL2-place.of** Kitso

'Kitso's children.' (originally 'the children at Kitso's place': Creissels 2017: 13)

Synchronic correlations may be spurious

(8) Old French

- (a) *la nuit que mesire Gauvain jut avec la*
the night **that** lord Gauvain slept with the
bele file Helient le roi de Norgales
beautiful daughter Helient the king of Norgales

'The night lord Gauvain slept with Helient, the beautiful daughter of the king of Norgales' (Schafroth 1993: 84: relative element derived from a corresponding Latin one, in turn derived from an interrogative/indefinite element)

- (b) *les cols de lor chevaus*
the necks **of** their horses

'the necks of their horses' (Heine 1997: possessive element derived from an adposition meaning 'from')

Synchronic correlations may be spurious

In cases where no diachronic evidence is available, a conservative criterion could be to only consider the cases where the relevant constructions do not share any morphology, as this is suggestive of distinct origins:

- This does not work for all word order dyads, however.
- For example, adpositional constructions may not share any morphology with verb-object constructions or possessive constructions, yet the adposition may be derived from verbs or possessed nouns that are no longer identifiable at the synchronic level.

(9) Ga (Niger-Congo)

è **kè** tsó tswà gbékě̀ lè
he **with** stick hit child the

‘He hit the child with a stick.’ (Lord 1993: 117; adposition derived from a ‘take’ verb in a VO construction, but this is not apparent synchronically)

Synchronic correlations may be spurious

These facts may have different impact for different word order correlations:

- Both the likelihood of spurious correlations and the criteria that can be used to identify non-spurious ones may vary depending on the particular word order dyads being considered.
- In general, however, non-spurious correlations cannot be identified based on the synchronic distribution of individual orders, because this distribution does not reveal what evidence (if any) is actually available for such correlations.
- Either diachronic evidence is available, or some consistent criterion should be devised to decide what type of synchronic evidence can be used.

**No overarching principle of
causation**

No overarching principle of causation

Assuming we can identify a non-spurious synchronic distributional correlation between particular relative clause orders and particular possessor orders, can we take this as evidence for **an overarching principle of causation specifically pertaining to these orders?**

No overarching principle of causation

Relative clause constructions and possessive constructions arise in several ways cross-linguistically. For example, they can each arise through the reinterpretation of several other constructions.

- Relative clause constructions can originate from appositional constructions, possessive constructions, interrogative constructions, combinations of independent clauses, and several others (see e.g. Lehmann 1984, Heine and Kuteva 2007).
- Possessive constructions too can originate from various types of appositional constructions, as well as from locative constructions, constructions expressing origin from a source, and several others (see e.g. Heine 1997).

In such cases, other things being equal, relative clause order and possessor order will reflect the order of the source.

No overarching principle of causation

Alternatively, relative clause constructions and possessive constructions can be created as such from the beginning by combining elements that function as heads and modifying expressions.

(10) Chacaltongo Mixtec (Oto-Manguenan)

kačíní peðrú
hat Pedro

'Pedro's hat' (Macaulay 1996: 108)

In this case particular relative clause orders and possessor orders will arise directly, rather than being a reflection of the order of some other construction.

No overarching principle of causation

In yet other cases, particular relative clause orders or possessor orders arise through changes in the order of an existing relative clause or possessor expression.

(11) Georgian (Kartvelian)

**ṣen-gan ro miviv^γeb, *im pul-it me*
you-from that I.receive.it that money-INSTR I.NOM
gadavixdi val-s
I.pay.it debt-DAT**

'I will pay off the debt with that money which I receive from you.'
(Harris 1994: 133; the construction originated as an existing relative clause started to be placed in prenominal, rather than postnominal position)

No overarching principle of causation

Synchronically, then, the cross-linguistic distribution of particular relative clause orders and possessor orders will ultimately be a result of the cross-linguistic distribution of **three distinct components**:

- (i) **Different source constructions** that give rise to relative clause constructions and possessive constructions;
- (ii) **Developmental processes** whereby particular relative clause constructions and possessive constructions evolve from their respective sources;
- (iii) **Retention processes** whereby particular relative clause constructions and possessive constructions are transmitted from one generation of speakers to the next once they develop in a language.

No overarching principle of causation

Synchronic correlations between particular possessor orders and particular relative clause orders must then be a result of three possible types of correlations,

- (i) **correlations between source constructions;**
- (ii) **correlations between developmental processes;**
- (iii) **correlations between retention processes;**

as well as **the cross-linguistic frequency** of individual constructions and processes.

No overarching principle of causation

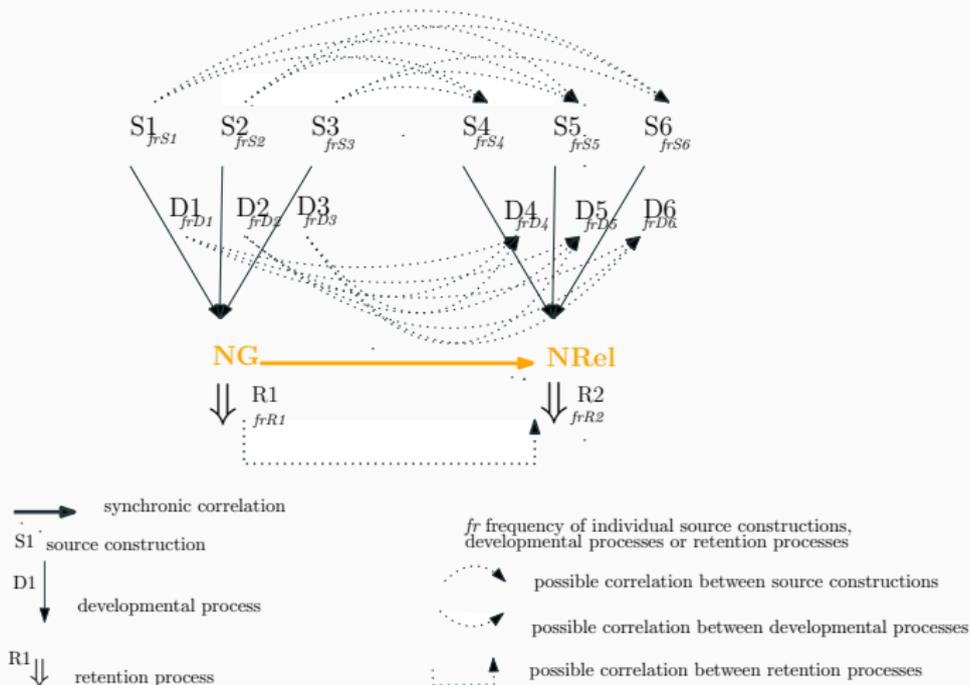


Figure 1: Possible origins of the synchronic correlation $NG \rightarrow NRel$

No overarching principle of causation

Why does this matter?

- If word order correlations emerge diachronically as a result of correlation or frequency patterns for source constructions, developmental processes or retention processes, any proposed explanatory principle should apply to these patterns, not the synchronic word order correlation in itself (Bybee 1988).
- But synchronic word order correlations are usually explained in terms of principles pertaining to the synchronic properties of the relevant word orders, for example the processing ease of the resulting syntactic configurations.
- These principles may not provide a viable explanation for correlation or frequency patterns for source constructions or developmental processes.

No overarching principle of causation

The synchronic correlation between possessor order and relative clause order has been explained in terms of processing principles pertaining to the **head-modifier structure** of relative clause constructions and possessive constructions.

- These constructions, however, can be derived from and continue the order of other constructions, so the synchronic correlation between their respective word orders could be a result of correlation or frequency patterns for the word orders of their respective sources.
- In this case, the assumed processing principle should apply to **the word orders of the source constructions**, not the word order of the relative clause construction and the possessive construction in themselves.
- Yet, the source constructions often **do not have a head-modifier structure**, so correlation or frequency patterns for their respective orders cannot be explained in terms of processing principles pertaining to this type of structure.

No overarching principle of causation

Relative clauses, possessors and their respective heads can originate from elements in apposition to each other:

In many analyses of appositional constructions, the two appositives do not stand in a head-modifier relationship.

Rather, they are two coreferential expressions with the same syntactic status within the sentence, i.e. '**X_i**, the VERBing **one_i**;' '**X_i**, Y's **thing_i**;' Keizer 2007, Bauer 2017, among others).

No overarching principle of causation

Relative clauses and their heads can also originate from elements that belong to independent clauses, and therefore do not stand in a head-modifier relationship.

(12) Bambara (Mande)

Cε *ye* *misi* **min** *ye* *jara* *y'* *o* *fara*
man TAM cow REL see TAM lion PRO kill

'The lion killed the cow that the man saw.' (Kuteva and Comrie 2005: 214, based on data by Denis Creissels: originally 'the man saw that cow, the lion killed it', relative marker derived from a demonstrative element)

No overarching principle of causation

(13) Ancient Greek

- (a) *nómoisi* **toús** *án* *sphi*
law-DAT.PL **REL.ACC.PL** PTCL 3PL.DAT
Sólōn *thē-tai*
Solon.NOM make.AOR.SUBJ-3SG

'by whatever laws that Solon should make' (Herodotus, 1.29)

- (b) *thaúmazen* *pur-à* *poll-à*
marvel-IMPF.3SG fire-ACC.PL many-ACC.PL
tà *kaíeto* *llióthi* *prò*
REL/ANAPH.NOM.PL burn-IMPF-3SG Troy before

'He marveled at the many fires, **those** burned before Troy/ **they** burned before Troy.' > 'He marveled at the many fires **that** burned before Troy.' (Homer, Iliad 10.12; Monteil 1963: 28)

No overarching principle of causation

Possessive constructions can be derived from structures where the possessor is part of a predicating expression or a topic, rather than a modifying expression (Schuh 1983, Heine 1997).

(14) Kanakuru (Chadic)

bili **ma** *lowoi*
horn **POSS** boy

'the boy's horn' (possessive element derived from a demonstrative, under one possible analysis in a construction of the type 'the horn (is) that (of) the boy': Schuh 1983: 183, 193)

(15) Kairiru (Oceanic)

Nur yaqal qajuo-ny

Nur he cousin-his

'Nur's cousin' (Lichtenberk 1985: 99)

No overarching principle of causation

The known developmental processes that give rise to possessive constructions and relative clause constructions also do not appear to be related to the head-modifier structure of these constructions:

- Appositional constructions and combinations of independent clauses plausibly evolve into relative clause constructions because they involve two coreferential expressions, one of which is semantically generic and can therefore be reanalysed as a relative clause marker ('X, **the one** Y VERBed > 'The X **that** Y VERBed'; 'X, **that one** VERBed > 'the X **that** VERBed').
- Several constructions plausibly evolve into possessive constructions because they involve a possessive relationship between two entities ('X, **the one** (of) Y'), or this relationship can be inferred from the context anyway ('The X **at** Y', 'The X **from** Y' > 'The X **of** Y').

No overarching principle of causation

- These are processes of context-induced reinterpretation, independent of the syntactic structure of the resulting constructions.
- Thus, if a synchronic correlation between relative clause order and possessor order reflects correlations between these processes, there is no evidence that it is motivated by principles pertaining to the head-modifier structure of possessive constructions and relative clause constructions.

No overarching principle of causation

What all this shows:

- To the extent that some synchronic word order correlation reflects correlation or frequency patterns for the source constructions or developmental processes that give rise to the relevant word orders, the relevant principles of causation cannot be inferred from the synchronic properties of the relevant word orders.
- Principles inferred from these properties may be not applicable to correlations or frequency patterns for source constructions, and may not provide the actual explanation for correlation or frequency patterns for developmental processes.

No overarching principle of causation

- Also, the synchronic correlation can be a combined result of multiple correlation or frequency patterns (for multiple source constructions and developmental processes leading to the relevant word orders, or for retention processes involving these orders). These patterns will likely reflect different principles of causation.
- Patterns pertaining to source constructions or developmental processes will plausibly reflect different principles of causation depending on the constructions or processes involved.
- Patterns pertaining to retention processes, on the other hand, will likely be related to the properties of the word orders that are retained.
- So the synchronic word order correlation will likely reflect **multiple principles of causation**, rather than some overarching principle pertaining to the correlation as a whole.

What distributional data?

What distributional data?

- In order to account for a synchronic word order correlation, the various correlation or frequency patterns should then be identified that give rise to that correlation over time.
- This cannot be done based on the synchronic cross-linguistic distribution of the relevant word orders, for three reasons.

What distributional data?

- (i) Synchronic distributions do not reveal what source constructions or developmental processes give rise to particular word orders.
- (ii) Synchronic distribution can originate from several possible correlation or frequency patterns, so they cannot be taken as evidence for any of these in particular.
- (iii) Synchronic distributions can be a combined result of multiple correlations or frequency patterns. These will contribute to different extents to the synchronic correlation depending on the absolute cross-linguistic frequency of the relevant constructions or processes. The contribution of individual patterns, however, cannot be inferred from the synchronic distribution, because this distribution does not reveal the cross-linguistic frequency of individual constructions or processes.

We need different distributional data

These facts mean that correlation or frequency patterns for source constructions, developmental processes or retention processes must be identified by looking at **the cross-linguistic distribution of these constructions and processes**, not the resulting synchronic distribution.

- In order to account for particular synchronic correlations, then, different distributional data are ultimately needed than those used to establish the correlation in the first place.
- Synchronic correlations are identified based on the cross-linguistic distribution of particular grammatical phenomena.
- But in order to identify the actual correlation or frequency patterns ultimately responsible for the synchronic correlation we need data about the cross-linguistic distribution of particular source constructions, developmental processes or retention processes, irrespective of the synchronic correlation in itself.

A source-oriented perspective

Implicational universals in a source-oriented perspective

These facts suggest a shift in perspective about implicational universals:

- While implicational universals can be used as **descriptive statements about particular synchronic distributional correlations**, they cannot be treated as **explanatory statements** about principles of causation leading to these correlations.
- This is because (i) synchronic correlations may be spurious, (ii) they can be a result of multiple correlations or frequency patterns, which can be motivated by other principles, and (iii) these patterns cannot be inferred from the synchronic distribution anyway.

Implicational universals in a source-oriented perspective

These facts may have different impact for different implicational universals. In general, however, they call for a **source-oriented** approach to implicational universals and recurrent cross-linguistic patterns in general (Cristofaro 2013, 2014, 2017, 2019; see Blevins 2004 for a similar approach in phonology): research on and explanations of these patterns should concentrate on multiple sources and processes that shape the pattern over time, rather than the resulting pattern in itself.

Abbreviations

ANAPH	anaphora	LK	linker
CL1	classifier 1	M	masculine
CL2	classifier2	NMLZ	nominalizer
CSTR	construct state	NOM	nominative
DAT	dative	PAST	past
DEM	demonstrative	PL	plural
DIST	distal	POSS	possessive
ERG	ergative	POSS	possessive
GEN	genitive	REL	relative
IMPF	imperfective	S	subject index
INSTR	instrumental	SUBJ	subjunctive

References

- Anderson, S. R. (2005). Morphological universals and diachrony. In G. Booij and J. van Marle (Eds.), *Yearbook of Morphology 2004*, pp. 1–17. Dordrecht: Springer.
- Anderson, S. R. (2016). Synchronic vs. Diachronic Explanations and the Nature of the Language Faculty. *Annual Review of Linguistics* 2, 11–31.
- Aristar, A. R. (1991). On diachronic sources and synchronic patterns: an investigation into the origin of linguistic universals. *Language* 67, 1–33.
- Bauer, B. L. M. (2017). *Nominal apposition in Indo-European : its forms and functions, and its evolution in Latin-Romance*. Berlin and New York: Mouton de Gruyter.
- Blevins, J. (2004). *Evolutionary phonology: the emergence of sound patterns*. Cambridge: Cambridge University Press.
- Bybee, J. (1988). The diachronic dimension in explanation. In J. A. Hawkins (Ed.), *Explaining language universals*, pp. 350–79. Oxford: Basil Blackwell.

References

- Bybee, J. (2006). Language change and universals. In R. Mairal and J. Gil (Eds.), *Linguistic Universals*, pp. 179–94. Cambridge: Cambridge University Press.
- Bybee, J. (2008). Formal Universals as Emergent Phenomena: The Origins of Structure Preservation. In J. Good (Ed.), *Linguistic Universals and Language Change*, pp. 108–21. Oxford: Oxford University Press.
- Bybee, J. (2009). Language universals and usage-based theory. In M. Christiansen, C. Collins, and S. Edelman (Eds.), *Language Universals*, pp. 17–40. Oxford: Oxford University Press.
- Creissels, D. (2017). *Grammaticalization in Tswana*. Downloadable at <http://www.deniscreissels.fr>.
- Cristofaro, S. (2011). Language Universals and Linguistic Knowledge. In J. J. Song (Ed.), *Handbook of Linguistic Typology*, pp. 227–49. Oxford: Oxford University Press.

Cristofaro, S. (2013). The referential hierarchy: Reviewing the evidence in diachronic perspective. In D. Bakker and M. Haspelmath (Eds.), *Languages across Boundaries: Studies in the Memory of Anna Siewierska*, pp. 69–93. Berlin and New York: Mouton de Gruyter.

Cristofaro, S. (2014). Competing motivations and diachrony: what evidence for what motivations? In B. MacWhinney, A. Malchukov, and E. Moravcsik (Eds.), *Competing motivations in grammar and usage*, pp. 282–98. Oxford: Oxford University Press.

Cristofaro, S. (2017). Implicational universals and dependencies between grammatical phenomena. In N. Enfield (Ed.), *Dependencies in Language: On the Causal Ontology of Linguistic Systems*, pp. 9–24. Berlin: Language Science Press.

References

- Cristofaro, S. (2019). Taking diachronic evidence seriously: Result-oriented vs. source-oriented explanations of typological universals. In K. Schmidtke-Bode, N. Levshina, S. M. Michaelis, and I. A. Seržant (Eds.), *Explanation in typology: Diachronic sources, functional motivations and the nature of the evidence*, pp. 25–46. Berlin: Language Science Press.
- DeLancey, S. (1986). *Relativization as nominalization in Tibetan and Newari'*. Paper presented at the 19th International Conference on Sino-Tibetan Languages and Linguistics.
- DeLancey, S. (1999). Relativization in Tibetan. In Y. P. Yadava and W. W. Glover (Eds.), *Topics in Nepalese Linguistics*, pp. 231–49. Kathmandu: Royal Nepal Academy.
- DeLancey, S. (2002). Relativization and Nominalization in Bodic. In *Proceedings of the Twenty-Eighth Annual Meeting of the Berkeley Linguistic Society*, pp. 55–72.

References

- Deutscher, G. (2001). The rise and fall of a rogue relative construction. *Studies in Language* 25, 405–22.
- Dryer, M. (1992). The Greenbergian word order correlations. *Language* 68, 81–138.
- Dryer, M. (2007). Word Order. In T. Shopen (Ed.), *Language Typology and Syntactic Description. 2nd Edition*, Volume 1: *Clause structure*, pp. 61–131. Cambridge: Cambridge University Press.
- Evans, N. and S. C. Levinson (2009). The myth of language universals: Language diversity and its importance for cognitive science. *Behavioral and brain sciences* 32, 429–448.
- Givón, T. (1975). Serial verbs and syntactic change: Niger-Congo. In C. N. Li (Ed.), *Word order and word order change*, pp. 47–112. Austin: University of Texas Press.
- Givón, T. (1979). *On Understanding Grammar*. New York: Academic Press.

References

- Greenberg, J. H. (1969). Some methods of dynamic comparison in linguistics. In J. Puhvel (Ed.), *Substance and structure of language*, pp. 147–203. Berkeley and Los Angeles: University of California Press.
- Greenberg, J. H. (1978). Diachrony, synchrony and language universals. In J. H. Greenberg, C. H. Ferguson, and E. A. Moravcsick (Eds.), *Universals of human language*, Volume 1: Method and theory, pp. 62–91. Stanford: Stanford University Press.
- Harris, A. C. (1994). On the History of Relative Clauses in Georgian. In H. I. Aronson (Ed.), *Non-Slavic Languages of the USSR: Papers from the Fourth Conference*, Columbus, Ohio, pp. 130–142. Slavica.
- Hawkins, J. A. (1983). *Word order universals*. New York: Academic Press.
- Hawkins, J. A. (1994). *A Performance Theory of Word Order and Constituency*. Cambridge: Cambridge University Press.

References

- Hawkins, J. A. (2004). *Efficiency and Complexity in Grammars*. Oxford: Oxford University Press.
- Hawkins, J. A. (2014). *Cross-linguistic Variation and Efficiency*. Oxford: Oxford University Press.
- Heine, B. (1997). *Possession*. Cambridge: Cambridge University Press.
- Keizer, E. (2007). *The English Noun Phrase*. Cambridge: Cambridge University Press.
- Kuteva, T. and B. Comrie (2005). The typology of relative clause formation in African languages. In E. Voeltz (Ed.), *African Studies*, pp. 209–28. Amsterdam and Philadelphia: John Benjamins.
- Lichtenberk, F. (1985). Possessive constructions in Oceanic languages and in Proto-Oceanic. In A. Pawley and L. Carrington (Eds.), *Austronesian linguistics at the 15th Pacific Science Congress*, Pacific Linguistics. Canberra: The Australian National University.

References

- Lord, C. (1993). *Historical change in serial verb constructions*. Amsterdam and Philadelphia: John Benjamins.
- Macaulay, M. (1996). *A Grammar of Chalcatongo Mixtec*. University of California Publications in Linguistics 127. Berkeley and Los Angeles and London: University of California Press.
- Monteil, P. (1963). *La phrase relative en grec ancien*. Paris: Klincksieck.
- Newmeyer, F. J. (1998). *Language Form and Language Function*. Cambridge, Mass.: The MIT Press.
- Newmeyer, F. J. (2005). *Possible and Probable Languages*. Oxford: Oxford University Press.
- Reh, M. (1996). *Anywa language: description and internal reconstruction*. Köln: Rüdiger Köppe.

- Schafroth, E. (1993). *Zur Entstehung und vergleichenden Typologie der Relativpronomina in den romanischen Sprachen*. Tübingen: Max Niemeyer.
- Schuh, R. G. (1983). The evolution of determiners in Chadic. In E. Wolff and H. Meyer-Bahlberg (Eds.), *Studies in Chadic and Afroasiatic Linguistics*, pp. 157–210. Hamburg: Helmut Buske.
- Yap, F. H., F. Pik-ling Choi, and K. Cheung (2010). Delexicalizing *di*: How a Chinese noun has evolved into an attitudinal nominalizer. In A. Van linden, J.-C. Verstraete, and K. Davidse (Eds.), *Formal Evidence in Grammaticalization Research*, pp. 63–92. Amsterdam and Philadelphia: John Benjamins.