Chapter 2

Implicational universals and dependencies

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1 Introduction

In the typological approach that originated from the work of Joseph Greenberg, implicational universals of the form X → Y capture recurrent cross-linguistic correlations between different grammatical phenomena X (the antecedent of the universal) and Y (the consequent of the universal), such that X only occurs when Y also occurs. Y, on the other hand, can also occur in the absence of X.

Classical typological explanations for these correlations often invoke functional principles that favor Y and disfavor X. For example, a number of implicational universals describe the distribution of overt marking for different grammatical categories. If overt marking is used for nominal, inanimate or indefinite direct objects, then it is used for pronominal, animate or definite ones. If it is used for inalienable possession ('John's mother', 'John's hand'), then it is used for alienable possession ('John's book'). If it is used for singular, then it is used for plural. These universals have been accounted for by postulating an economy principle whereby the use of overt marking is favored for the categories in the consequent of the universal (pronominal, animate, or definite objects, alienable possession, plural) and disfavored for those in the antecedent (nominal, inanimate, or indefinite direct objects, inalienable possession, singular). This is assumed to be due to the former categories being less frequent and therefore more in need of disambiguation (Greenberg 1966; Nichols 1988; Comrie 1989; Dixon 1994; Croft 2003; Haspelmath 2006 and Haspelmath 2008, among others).

This type of explanation accounts for the fact that there are cases where Y occurs while X does not, rather than the implicational correlation between the occurrence of X and that of Y. To the extent that they are offered as explanations

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for the implicational universal as a whole, however, the relevant functional principles are meant to account also for this correlation. In this respect, there is an (often implicit) assumption that the phenomena disfavored by some functional principle, for example overt marking for a more frequent category, can only take place if the phenomena favored by that principle, for example overt marking for a less frequent category, also occur. This presupposes that the occurrence of the latter phenomena is a precondition for the occurrence of the former, hence there is a dependency relationship between the two.[1]

These explanations, however, have mainly been proposed based on the synchronic distribution of the relevant grammatical phenomena, not the actual diachronic processes that give rise to this distribution in individual languages. In what follows, it will be argued that many such processes do not provide evidence for the postulated dependencies between grammatical phenomena, and suggest alternative ways to look at implicational universals in general.

2 The diachrony of implicational universals

2.1 No functional principles leading to dependency

A first problem with assuming a dependency relationship between different grammatical phenomena X and Y in an implicational universal is that, in many cases, the actual diachronic processes leading to configurations where Y occurs while X does not do not appear to be related to principles that favor Y as opposed to X. A a result, there is no evidence that there should be a dependency relationship between X and Y due to these principles.

This is illustrated precisely by a number of processes leading to the use of zero vs. overt marking for different grammatical categories. Sometimes, the initial situation is one where all of these categories are marked overtly, and the marker for the less frequent category is eliminated as a result of regular phonological changes. In English, for example, the current configuration with zero marked

[1] An alternative possibility would be that particular principles that favor Y and disfavor X lead to the former being present in most languages an the latter being absent in many languages. In this case, the languages that have X would most likely also have Y, but there would be no dependency between X and Y. This implies, however, that Y should be found in most of the world's languages, which is often not the case. For example, while languages usually do not have overtly marked inanimate direct objects and zero marked animate ones, they often use zero marking for both. Zero marking for animate direct objects, then, is not infrequent, so in principle it would be perfectly possible for a language to have overtly marked inanimate direct objects and zero marked animate ones.

singulars and *-s* marked plurals resulted from a series of phonological changes that led to the elimination of all inflectional endings except genitive singular *-s* and plural *-es* (Mossé 1949). As phonological changes are arguably independent of the categories encoded by the affected forms, such cases provide no evidence that the presence of overt marking is related to the need to disambiguate the relevant categories, and hence that this should lead to a dependency between these categories in regard to their ability to receive overt marking. In fact, cross-linguistically, such processes can also affect the less frequent category. In Sinhala, for example, some inanimate nouns have overtly marked singulars and zero marked plurals (e.g. *pot-a/ pot* 'book-SG/ book.PL'). This was a result of phonological changes leading to the loss of the plural ending of a specific inflectional class (Nitz & Nordhoff 2010).

In other cases, all of the relevant categories are originally zero marked, and overt markers for the less frequent category arise as a result of the reinterpretation of pre-existing elements. For example, as illustrated in (1) below for Kanuri, markers for pronominal, animate or definite direct objects are often structurally identical to, and diachronically derived from topic markers.

(1) Kanuri (Nilo-Saharan)

a. *Músa shí-**ga** cúro*
Musa 3SG-OBJ saw
'Musa saw him' (Cyffer 1998: 52)

b. *wú-**ga***
1SG-as.for
'as for me' (Cyffer 1998: 52)

Markers for alienable possession arise from locative expressions, e.g. 'at the home of' and the like, as illustrated in (2) for Ngiti.

(2) Ngiti (Nilo-Saharan)

a. *ma m-ìngyè àba **bhà** ɨdzalí-nga*
1SG SC-be.in.the.habit.PFPR father POSS courtyard-NOMLZR
'I normally stay at the courtyard of my father' (Kutsch Lojenga 1994: 322)

b. ***bhà:***
at.home
'at home' (Kutsch Lojenga 1994: 154)

Plural markers can arise from a variety of sources, for example distributive expressions, as in Southern Paiute, illustrated in (3). Another source are partitive expressions of the type 'many of us' and the like, in which the quantifier is dropped and the plural meaning associated with it is transferred to a co-occurring element, for example a genitive case inflection originally indicating partitivity, as illustrated in (4) for Bengali, or a verbal form, as illustrated in (5) for Assamese. In this language, the plural marker was originally a participial form of the verb 'to be' used in expressions such as 'both of them' (literally, '(they) being two').

(3) Southern Paiute (Uto-Aztecan)
*qa'nɪ / **qaŋqa'nɪ***
house / house.DISTR
'house, houses' (Sapir 1930: 258)

(4) Bengali (Indo-European)

a. *chēlē-**rā***
child-GEN
'children' (15th century: Chatterji 1926: 736)

b. *āmhā-**rā***
we-GEN
'of us' (14th century: Chatterji 1926: 735)

(5) Assamese (Indo-European)

a. *chātar-**hăt***
student-PL
'Students' (Modern Assamese: Kakati 1962: 295)

b. *dui-**hanta***
two-be.PTCPL
'Both of them' (Early Assamese: Kakati 1962: 282)

These processes are plausibly context-driven, either in the sense that some element becomes associated with a meaning that can be inferred from the context or in the sense that it takes on a meaning originally associated with a co-occurring element. Any restrictions in the distribution of the resulting markers are directly related to the properties of the source construction. For example, topic markers can become direct object markers when they are used with topicalized direct objects (Iemmolo 2010, among others). As topics are usually pronominal, animate,

and definite, it is natural that the resulting markers should be restricted to these types of direct objects, at least initially. Possession can be inferred in many contexts involving locative expressions (e.g., 'the courtyard in my father's house' > 'my father's courtyard': Claudi & Heine 1986; Heine, Claudi & Hünnemeyer 1991: chapter 6), so these expressions can easily develop a possessive meaning. As they are not usually used to refer to inalienably possessed items (? 'The mother in John's house', ? 'The hand in John's house'), the resulting possessive markers will be restricted in the same way. Distributives can develop a plural meaning because, when applied to individuated items, they always involve the notion of plurality (Mithun 1999: 90). Partitive expressions with plural quantifiers also involve the notion of plurality, so this notion is easily transferred from one component of the expression to another.

This type of process has long been described in classical historical linguistics and grammaticalization studies (see, for example, Heine, Claudi & Hünnemeyer 1991, Bybee, Perkins & Pagliuca 1994, or Traugott & Dasher 2005). In all of the cases just discussed, the use of overt marking for particular categories is a result of contextually dependent associations that speakers establish between those categories and highly specific source elements. The categories not involved in this process retain zero marking, which was the strategy originally used for all categories. In such cases too, then, there is no obvious evidence that the distribution of overt marking reflects some principle that favors overt marking for particular categories as opposed to others, nor that such a principle should determine a dependency between the use of overt marking for some category and its use for some other category. This is further confirmed by the fact that, depending on the source construction, some of these processes can also give rise to markers for more frequent categories, even if less frequent categories are zero marked in the language. In Imonda, for example, a partitive case ending took on a meaning component originally associated with a co-occurring quantifier. As this process took place in expressions involving singular quantifiers (e.g. 'one of the women'), the result was the creation of a singular marker, leading to a situation where singular is overtly marked and plural is zero marked. This is illustrated in (6) (the marker is also used to indicate dual, and is therefore called "nonplural" in the source)[2].

[2] Evidence that the distribution of overt markers is directly related to the properties of the source construction is also provided by the fact that, cross-linguistically, overt markers derived from sources compatible with different categories usually apply to all of these categories regardless of their relative frequency. This is discussed in detail in Cristofaro (2013) and (2014) with regard to the development of direct object markers applying to all types of direct objects.

(6) Imonda (Border)

a. *agõ-**i**anèi-m* *ainam* *fa-i-kõhõ*
women-NONPL-GL quickly CL-LNK-go
'He grabbed the woman' (Seiler 1985: 194)

b. *mag-m ad-**i**anèi-m*
one-GL boys-SRC-GL
'To one of the boys' (Seiler 1985: 219)

2.2 Co-occurrence patterns are not dependency patterns

Another problem for the idea of a dependency between X and Y in implicational universals of the form X → Y is that, in several cases where X and Y co-occur, the two are not actually distinct phenomena, hence there is no evidence that one of the two is a precondition for the other.

When overt marking for singular co-occurs with overt marking for plural, for example, the relevant markers are actually sometimes gender markers that evolved from demonstratives or personal pronouns, as is often the case with gender markers (Greenberg 1978). As the source elements had distinct singular and plural forms, the resulting gender markers end up indicating singular and plural in addition to gender. This process, for instance, has been reconstructed by Heine for Kxoe, where a series of gender markers with distinct singular and plural forms are structurally similar to the forms of the third person pronoun, as can be seen from Table 1.

Table 1: Gender/number markers and third person pronouns in Kxoe (Khoisan: Heine 1982: 211)

		Nouns		Pronouns	
SG	M	/õa-**m**à	'boy'	xà-**m**á, á-**m**à, i-**m**à	'he'
	F	/õa-**h**è	'girl'	xà-**h**è, á–**h**è, i–**h**è	'she'
	C	/õa-**(**'à), /õa-**dj**ì	'child'	(xa-'**à**)	'it'
PL	M	/õa-//u'a	'boys'	xà-//u̯á, á-//u̯á, í-//u̯á	'they'
	F	/õa-**dj**ì	'girls'	xà-**dj**í, á-**dj**í, í-**dj**í	'they'
	C	õa-**n**à	'children'	xà-**n**à, á-**n**à, í-**n**à	'they'

As the singular and plural markers are originally different paradigmatic forms of the same source element (one not specifically used to indicate number), cases

like this provide no evidence that there is a dependency between overt marking for singular and overt marking for plural in themselves. To prove this, one would need cases where singular and plural markers develop through distinct processes. It is not clear, however, how many of the cases where singular and plural markers co-occur synchronically are actually of this type.

A similar example is provided by a word order universal discussed by Hawkins (1983; 2004). In prepositional languages, if the relative clause precedes the noun, then so does the possessive phrase. Hawkins accounts for this by assuming that, since relative clauses are structurally more complex than possessive phrases, the insertion of the former between the preposition and the noun creates a configuration more difficult to process than the insertion of the latter. Thus, a language will permit the more difficult configuration only if it also permits the easier one.

Aristar (1991) shows, however, that relative clauses and possessive phrases sometimes represent an evolution of the same construction, one where an expression involving a demonstrative is in apposition to a head noun, e.g. 'That (who) Verbed, X' or 'That (of) Y, X', which give rise, respectively, to 'The X who Verbed' and 'The X of Y', with the demonstrative evolving into a genitive and a relative marker. Evidence of this process is provided for example by Amharic (one of the languages considered by Hawkins), where the same element, derived from a demonstrative, is used both as a relative and as a possessive marker (Cohen 1936; Leslau 1995).

(7) Amharic (Semitic)

a. *yä-mäṭṭa* *säw*
REL-come.PERF.3SG person
'a person who came' (Leslau 1995: 81)

b. *yä-tämari* *mäṣaf*
POSS-student book
'a student's book' (Leslau 1995: 81)

In such cases too, there is no evidence of a dependency between preposed relatives and preposed possessive phrases in themselves, because the reason why both the relative clause and the possessive phrase precede the noun is that this was the order of the demonstrative phrase from which they both derive. Evidence for the correlation could be provided by cases where preposed relative clauses and preposed possessive phrases develop independently, but, once again, it is not clear how many of the synchronic cases where the two co-occur are actually of this type.

3 Accounting for unattested configurations: goal-oriented vs. source-oriented explanations

The idea that the configurations described by an implicational universal X → Y reflect the properties of particular source constructions and developmental processes provides no specific explanation for why X does not usually occur in the absence of Y. In theory, this could still be viewed as evidence that there must be some general functional principle that disfavors X as opposed to Y, leading to a dependency relationship between the two. In this case, however, it is necessary to explain how such a principle could interact with the actual, apparently unrelated diachronic processes leading to the configurations described by the universal.

One possibility would be to suppose that the principle provides the ultimate motivation for individual diachronic processes. For example, overt markers for less frequent categories develop through several processes of reinterpretation of different source elements, but these processes could all somehow be triggered by the relative need to give overt expression to those categories. Likewise, phonological erosion of markers used for more frequent categories could ultimately be related to the lower need to give overt expression to those categories.

These assumptions, however, are not part of any standard account of the relevant processes in historical linguistics, and they are not supported by any kind of direct evidence (see Cristofaro 2013 and 2014 for further discussion). Rather, some processes provide evidence to the contrary. For example, when markers for particular categories develop through the reinterpretation of pre-existing elements, the language often already has other markers for those categories. This supports the idea that such processes are a result of context-driven inferences, not the relative need to give overt expression to particular categories. Also, some of the processes that give rise to configurations where Y occurs while X does not can also give rise to the opposite configuration. For example, as mentioned above, phonological erosion can target both markers for more frequent categories and markers for less frequent categories, leading to configurations where more frequent categories are overtly marked and less frequent categories are zero marked. Likewise, depending on the source construction, some processes of context-driven reinterpretation can give rise both to markers for less frequent categories and markers for more frequent categories, leading to configurations where less frequent categories are zero marked and more frequent categories are overtly marked. This suggests that whether or not X can occur without Y actually depends on particular processes and source constructions that give rise to X, rather than any principle specifically pertaining to X or Y in themselves.

Another possibility would be that particular functional principles that favor Y as opposed to X are responsible for differential transmission rates for X and Y within a speech community, ultimately leading to the loss or maintenance of different configurations involving X and Y. For example, it could be the case that, while the development of overt marking for particular categories is independent of the relative frequency of those categories, overt marking for less frequent categories is more easily transmitted than overt marking for more frequent categories because the latter are less in need of disambiguation. This could eventually lead to the loss of configurations where more frequent categories are overtly marked[3].

As suggested by a referee, this would be the equivalent of the technical distinction between proximate vs. ultimate explanations in evolutionary biology (Scott-Phillips, Dickins & West 2011, among many others): the development of particular traits is independent of the fact that those traits confer an evolutionary advantage to the organisms carrying them, but this provides the ultimate explanation for their distribution in a population. In evolutionary biology, however, this idea is based on the fact that particular traits are demonstrably adaptive to the environment, in the sense that they make it more likely for the organisms carrying them to survive and pass them on to their descendants. For languages, there is generally no evidence that particular functional properties of grammatical constructions (e.g. the fact that they conform to a principle of economy) are adaptive, in the sense of these properties making it demonstrably more likely for the construction to be transmitted from one speaker to another. This is a crucial difference between linguistic evolution and biological evolution, and there is a long tradition of linguistic thought in which the transmission of individual constructions within a speech community is entirely determined by social factors independent of particular functional properties of the construction (see, for example, McMahon 1994 and Croft 2000 for reviews of the relevant issues and literature).

In general, diachronic evidence suggests a different way to tackle the problem of why certain configurations are unattested or rare. Classical explanations of this phenomenon are goal-oriented, in the sense that they assume that particular configurations arise or do not arise in a language depending on whether the properties of the configuration conform to particular principles, for example economy or processing ease. To the extent that individual configurations are a result of specific developmental processes involving pre-existing constructions, however, the issue of why certain configurations arise or do not arise should

[3] Note, however, that this predicts that configurations where more frequent and less frequent categories are both overtly marked should not occur, or should be relatively rare, which is not the case.

rather be addressed by taking a source-oriented approach, that is, by looking at what source constructions, contexts and developmental processes could give rise to those configurations, and how frequent these are. This need not be related to any principle pertaining to the resulting configurations in themselves, and should therefore be assessed independently.

4 Concluding remarks

Ever since Greenberg's work, implicational universals have been regarded as one of the most important results of typological research because it is generally assumed that they capture some type of dependency between logically distinct grammatical phenomena. The fact that diachronic data often provide no evidence either for the principles assumed to motivate the dependency or for the dependency in the first place suggests that this view is at least partly biased by the adoption of an exclusively synchronic perspective. In general, this supports the point raised by some typologists that explanations for language universals should always be tested against the diachronic processes that give rise to the relevant grammatical phenomena in individual languages (Bybee 1988, 2006 and 2008, among others; see also Cristofaro 2013 and 2014 for a recent elaboration on this view and Blevins 2004 for a similar approach in phonology).

There also is, however, a more fundamental sense in which diachronic evidence challenges current views of implicational universals The use of implicational universals to describe the attested distributional configurations for two grammatical phenomena X and Y (that is, given X → Y, X and Y both present or both absent, or X absent and Y present) is usually associated with an assumption that these configurations are manifestations of some overarching pattern captured by the universal. This is apparent from the fact that the various configurations are usually accounted for in terms of a single principle, for example economy or processing ease. Diachronic evidence shows, however, not only that individual principles that can be postulated on synchronic grounds may play no role in the actual diachronic processes that give rise to the relevant configurations, but also that different configurations described by a universal can be a result of very different processes.

For example, the use of overt marking for both singular and plural and its use just for plural can be a result of different grammaticalization processes involving different source constructions, such as demonstratives or personal pronouns evolving into gender markers on the one hand and distributives evolving into plural markers on the other. Different instances of the same configuration can also be a result of very different processes. For example, phonological erosion,

meaning transfer from a quantifier to an accompanying element, and the grammaticalization of distributives into plural markers can all give rise to a configuration with zero marking for singular and overt marking for plural, yet they do not obviously have anything in common. In fact, at least some of these processes may also sometimes have the opposite outcome (zero marking for a more frequent category and overt marking for a less frequent one).

These facts suggest that implicational universals might actually just be schemas that are general enough to capture the outputs of several particularized diachronic processes, rather than theoretically significant generalizations capturing an overarching pattern. In domains such as biological evolution, the distribution of some trait in a population is demonstrably related to particular properties of that trait that are independent of its origin. Even if the trait develops through different mechanisms in different cases, then, its distribution will reflect some general underlying pattern. There is no evidence, however, that this is the case in linguistic evolution. In order to obtain a full understanding of implicational universals, then, we should focus on qualitative and quantitative data on different source constructions and developmental processes that can give rise to the distributional configurations described by individual universals, rather than the configurations in themselves.

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Abbreviations

ART	article	NOMLZ	nominalizer
C	common	NONPL	non-plural
DEP.FUT	dependent future	OBJ	object
DISTR	distributive	PFPR	perfective present
GEN	genitive	PTCPL	participle
GL	goal	REL	relative
IMPF	imperfect	SG	singular
INAL	inalienable		

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