

Explaining language universals

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0.1. Introduction

The goal of descriptive linguistics is to establish the range and distribution of grammatical patterns that occur in human languages and to explain these findings. For example, we want to know whether languages do or do not have bilabial fricatives and if they do, under what conditions they occur.

Statements of language universals have a double role in this endeavor. On the one hand, they serve to explain facts about individual languages. For example, if we know that all languages have stop consonants, it follows that German has them. On the other hand, universals themselves call for explanations: why should all languages have stops? In this paper, we will explore both of these roles of language universals; but first, a few words on what we will mean by "language universal" and by "explanation".

We will take a **language universal** to be a grammatical characteristic that can be reasonably hypothesized to be present in all or most human languages. A universal

hypothesis is reasonable if it is based on a large, genetically and areally balanced sample; or if it is predicted by an independently motivated principle; or if both are the case. We will use the term universal both for the characteristic itself and also for the statement describing it.

As all generalizations, language universal statements may vary in modality and domain. Re modality: some universals are stated as exceptionless, holding for every member of their universe. These are called **absolute** universals. Others are **probabilistic** (also called statistical), stated as holding for most but not all languages. Re domain: universals may be stated for the entire universe of languages or for a contextually-delimited sub-universe of them. The former are called **unrestricted** universals, the latter are **restricted** (also labeled implicational, or typological). The four types of universals defined by the two parameters are schematized and exemplified in (1).

(1) (a) UNRESTRICTED UNIVERSALS

(i) ABSOLUTE

Schema: In all languages, Y.

Example: In all languages, there are stop consonants.

(ii) PROBABILISTIC

Schema: In most languages, Y.

Example: In most languages, there are nasal consonants.

(b) RESTRICTED UNIVERSALS

(i) ABSOLUTE

Schema: In all languages, if there is X, there is also Y.

Example: In all languages, if there is /m/, there is also /n/.

(ii) PROBABILISTIC

Schema: In most languages, if there is X, there is also Y.

Example: In most languages, if the basic word order is SOV, manner adverbs precede the verb.

Absolute universals hypothesize that a grammatical property **must** be present in a language. Probabilistic universals say that a grammatical property is present in languages with some degree of **likelihood**. There is also a

third way of constraining what does and does not occur in languages: by stating what is universally **possible**, without being necessary or even probable. An example is a list of all the phonetic segment types that occur in human languages. In the literature, universals are generally understood to be either absolute or statistical (cf. Dryer 1997); but this third type of universals appears to be adopted by Optimality Theory. In this framework, all constraints on language structures are hypothesized to be universal but violable in that they may not be evident in every language (cf. section 0.5.2).

All language universals are merely hypotheses. Although they may hold exceptionless or with a certain degree of probability for a given sample of languages, there is no assurance that additional languages will not turn an absolute universal into a probabilistic feature, or a probabilistic feature into one that is merely possible but not likely. The only kind of crosslinguistic statement that is impervious to refutation is the weakest kind that simply says that a structural pattern is possible in human languages. This is so because once a pattern has been identified in a language, it must of course be possible.

Let us now turn to the definition of the second concept central to this article: **explanation**. The goal of an explanatory endeavor is to resolve a gap in the observer's mind between what he observes as occurring and what he expects to occur. In some cases, what occurs may seem likely but not necessary. If so, the explanatory task is to provide a reason why the actually occurring fact should be necessary. In other cases, what occurs may seem possible but not necessary and not even likely; if so, a successful explanation must render the observed fact at least probable, if not necessary. Yet in other cases, an observed fact may not even seem possible to the observer; if so, the explanation should at the least provide a reason why the observed fact should be possible. These three kinds of explanatory generalizations correspond to the three modality types of language-universal statements identified above.

Explanations differ in their breadth: an explanatory principle may itself be taken as an "explanandum" (Latin for 'something to be explained') calling for more general principles that it can be derived from.

Having characterized the focal concepts of this paper: language universals and explanations, let us turn to the two-fold role that language universals play in explaining language structure.

0.2. Universals as explanations

We will first consider how language universals explain facts about individual languages. Take the fact that adpositions in English are preposed to the noun phrase: the language has prepositions, as in *after class* (unlike the corresponding phrase in Hungarian: *óra után* "class after", which contains a postposition).

(2) LANGUAGE-SPECIFIC EXPLANANDUM

In English, adpositions precede their noun phrases.

How could this fact be explained? There are three available avenues of explanation: structural, historical, and functional.

A **structural explanation** derives a structural pattern from a more general one. If, following Dryer (1992), we classify syntactic constituents as branching and non-branching (that is, whether they normally consist of more than one word or just a single word), English turns out to exhibit a fairly consistent linear pattern that holds across constituent types: it generally places non-branching constituents before branching ones. For example, verbs precede their objects, and noun heads precede their relative clauses. Since adpositions are generally one-word - non-branching - constituents as opposed to the noun phrases they go with, the preposed position of English adpositions can be probabilistically derived from (3).

(3) LANGUAGE-SPECIFIC STRUCTURAL GENERALIZATION

In English, most non-branching constituents precede branching ones.

This English pattern is further derivable from a generalization of crosslinguistic scope. Dryer (1992) has noted that most languages exhibit a uniform ordering of syntactic constituents depending on whether they are branching or non-branching. For example, Norwegian and Thai follow the English pattern: VO and prepositions, while Japanese and Turkish show the opposite order: OV and postpositions.

(4) UNIVERSAL STRUCTURAL GENERALIZATION

In most languages, either all or most non-branching constituents precede branching ones, or all or most non-branching constituents follow branching ones.

This is an example of how a universal statement ((4)) provides a structural explanation for a fact about an individual language ((2)).

However, the explanation given in (4) is not maximally satisfying because it is not causal. What would a casual explanation of English prepositions be like? As Haiman remarks: "Everything is the way it is because it got that way." (Haiman 2003: 108) This means that searching for a causal explanation amounts to trying to find a **temporal process** whose input lacks the explanandum and whose output contains it.

If we start with an individual speaker of English and ask why he uses phrases like *around Chicago* and not *Chicago around*, we must conclude that the grammar of English in his head causes him to **use** prepositions rather than postpositions. This raises the next question: why is the grammar of English that the speaker has in his mind the way it is? The answer is that this is the grammar that he has **acquired** based on the ambient language.

But neither of these two processes - language use and language acquisition - provides a direct cause for how the grammar of English as a communal resource got to be the way it is because both acquisition and use presuppose the existence of a language to start with. To answer that question, we have to probe into the history of the language. A **historical** explanation of English prepositions will have to make reference to an earlier stage of the language with no prepositions and derive the present stage from it; such as (5).

(5) LANGUAGE-SPECIFIC HISTORICAL GENERALIZATION

Source: In English, all prepositions whose source is traceable within the history of the language have arisen either from verbs of verb-object phrases or from possessum constituents of possessive phrases.

Process: Linear order is preserved.

This generalization derives some - although not all - English prepositions from non-prepositions. Examples are *concerning the weather*, where the preposition comes from the verb *to concern*, and *inside (of) the house*, where the source construction was a possessive one ("in the side of the house").

(5) has some explanatory force but it calls for an explanation itself. Why did these changes occur in English and why did linear order remain invariant? A look at other

languages shows that these historical processes are not unique to English: adpositions are generally derived from genitives (e.g. in Basque and Buriat, cf. Bybee 1988: 354) or from verbs (e.g. in Mandarin Chinese, cf. Li & Thompson 1974) and the original order is generally preserved. The hedge "generally" is necessary: Harris and Campbell (1995: 212-215) provide interesting examples where in the course of the genesis of adpositions, constituent order has changed. The universal tendency is stated in (6).

(6) UNIVERSAL HISTORICAL GENERALIZATION

Source: In most languages, adpositions have historically arisen from verbs of a verb-object phrase or from possessum constituents of a possessive phrase.

Process: Linear order is generally preserved.

(6) is a language universal which provides a historical explanation for English prepositional order ((2)).

The occurrence of the changes in English is probabilistically explained by (6). But why should the change from transitive verb constructions and possessive constructions to adpositions be crosslinguistically common and why should linear order be generally preserved in the process? In her study of historical origins, Bybee remarks: "Ultimately, we are brought back to the synchronic plane where we must ask what cognitive processes are behind... the development of new adpositional phrases from nouns in genitive constructions." (Bybee 1988: 354) In other words, historical change - or the lack of it - must be driven for by **function**: by the goals that humans seek to achieve in using language and the physical and cognitive means available to them in the pursuit of these goals. Given that these goals and means are assumed to be universal within the human species, functional explanations cannot be language-specific: they must be universal. Here is a relevant universal functional principle.

(7) UNIVERSAL FUNCTIONAL GENERALIZATION

In all languages, the semantic and phonological reduction of frequently occurring phrases serves ease of production without impairing comprehensibility. Changing linear order in the process does not enhance either production or comprehension.

Semantic and phonological reduction in the genesis of adpositions is illustrable on the examples of *inside*,

outside, and *besides*. Semantically, the obligatoriness of spatial reference has been relaxed (cf. *besides this problem*). Phonologically, the original genitive preposition *of* has been fully lost in the case of *besides* (originally "by the side of") and is on its way out in *inside (of)* and *outside (of)*.

The discussion in this section illustrated one of the two ways in which language universals figure in linguistic explanations: they explain language-specific facts. The universal generalizations cited above serve to explain prepositional order in English ((2)) structurally ((4)), historically ((6)), and functionally ((7)). The concept of functional explanations will be further discussed in section 0.5. We will now turn to the other role of universals: serving as explananda themselves. In the next three sections, we will explore structural, historical, and functional explanations for universals.

0.3. Universals as explananda: structural explanations

As we saw in section 0.2, a language-specific fact is explained structurally if it can be shown to follow from a more comprehensive structural generalization. In the two case studies below, universals are explained in this manner.

0.3.1. Subjacency

Transformational generative grammar has analyzed English *wh*-questions as involving a movement rule that displaces *wh*-words from their underlying position to the beginning of the sentence. For example, the sentence ***What*** *did Sue give her husband?* is derived from *Sue gave her husband **what**?*

However, not all *wh*-questions derived by this analysis turn out to be grammatical. (8a) and (8b) are well-formed but (8c) is not.

- (8) (a) ***What*** *do you propose ___?*
(b) ***What*** *do you propose ___ was the reason?*
(c) ****What*** *do you make the proposal that ___ was the reason?*

An obvious guess at why (8c) is ungrammatical is that the underlying position of the *wh*-element is too far from its "landing site" - i.e. from the position into which it moves. Consider the underlying structures of the sentences of (8):

- (9) (a) [*You propose **what***]_S?

- (b) *[You propose [**what** was the reason]_S]_S?*
 (c) **[You make [the proposal that [**what** was the reason]_S]_{NP}]_S?*

In (9a), the word *what* moves out of its clause into a clause-external initial position: [**What** *[you propose ___]_S]_S? In the process, it crosses only one major syntactic juncture: the left boundary of its clause. The sentence is grammatical. In (9b), which is also grammatical, *wh*-movement applies twice: first, the word *what* moves outside its own clause resulting in *[You propose **what** [___ caused the problem]_S]_S?*, and then it moves to the front of the entire sentence. In the course of each of the two movements, it crosses only one clause boundary.*

In (9c), however, the *wh*-word's journey to the left is more complicated. As in (9a) and (9b), it first moves out of its clause resulting in *[You make [the proposal that **what** [___ caused the problem]_S]_{NP}]_S?* But now, on its way to crossing the left boundary of the entire sentence as it did in (9a) and (9b), it must also cross the left boundary of the noun phrase that its clause is embedded in: *[the proposal that **what** caused the problem]_{NP}*. Based on this extra hurdle, the explanation of why (9c) is ungrammatical might be a constraint against moving a question word across both a noun phrase and a clause boundary. This principle, known as the Complex NP Constraint, was first formulated by John R. Ross in 1967 and hypothesized to be universally valid. We will take it to be an explanandum.

(10) UNIVERSAL EXPLANANDUM

A question word cannot be moved in a single step across both a noun phrase boundary and a clause boundary.

What more general structural principle might (10) be derived from and thus explained by? There are also other constructions where the syntactic distance between underlying position and landing site seems to be constrained. Consider passives.

- (11) (a) ***The puppy** was fed cat food.*
 (b) ***The puppy** seems to have been fed cat food.*
 (c) ****The puppy** seems that it is likely to have been fed cat food.*

Here are sketches of the underlying structures.

- (12) (a) *[Was fed **the puppy** cat food.]_S*
 (b) *[Seems [to have been fed **the puppy** cat food.]_S]_S*

- (c) **[Seems that [it is likely [to have been fed **the puppy** cat food.]_s]_s]_s*

Just as in wh-movement, a leftward movement is involved here. The movement of *the puppy* from (12a) to (11a) involves no crossing of any noun phrase or clause boundary (unlike wh-words, subjects are assumed to be inside the clause). The movement of *the puppy* from (12b) to (11b) involves the crossing of the single boundary of the clause *[to have been invited John to Mary's house]_s*. But in (12c), the movement of *John* out of its underlying structure involves the crossing of two clause boundaries: the left boundary of the clause *[to be invited ...]_s* and the left boundary of the clause *[it is likely to...]_s*. We might therefore offer the following hypothesis.

(13) UNIVERSAL STRUCTURAL GENERALIZATION

A noun phrase cannot be moved in a single step across more than one clause boundary.

A single generalization may now be formulated to encompass the two constraints in (10) and (13) if we create the concept "major constituent" as a cover term for clause and noun phrase:

(14) UNIVERSAL STRUCTURAL GENERALIZATION

A constituent cannot be moved in a single step across more than one major constituent boundary.

This principle, known as Subjacency (cf. Chomsky 1986: 28-31) was tentatively proposed as an absolute language universal. Languages have subsequently turned up that violate it (cf. Hawkins 2004: 193-197) and thus it is at best a statistical universal. If so, it provides a probabilistic structural explanation for our initial explanandum in (10).

0.3.2. Constituent order

In the past 40 or so years, a number of crosslinguistically recurrent correlations have been found among the orderings of different syntactic constituents. Here are some of property clusters Dryer has observed in a sample of 625 languages (Dryer 1992):

(15) UNIVERSAL EXPLANANDUM

Languages tend to have either
- Verb & Object,

- Verb & Manner Adverb,
 - Noun & Relative Clause, and
 - Adposition & Noun Phrase,
- or
- Object & Verb,
 - Manner Adverb & Verb,
 - Relative Clause & Noun, and
 - Noun Phrase & Adposition.

Illustrations below come from Rapa Nui (a VO language) and Japanese (an OV language).

(16)

RAPA NUI

JAPANESE

Verb & Object

to'o i te moni
take ACC the money

'take the money'

Object & Verb

okane o toru
money ACC take

Verb & Manner Adverb

hapi riva
learn well

'study well'

Manner Adverb & Verb

yoku benkyoosuru
well study

Noun & Relative Clause

te poki noho oruga
the boy stay upon
o te miro
GEN the boat

'the boy who stays on the boat'

Relative Clause & Noun

sono booto ni tomatteiru
the boat on staying
otokonoko
boy

Adposition & Noun Phrase

i te money
ACC the money

'the money (ACC)'

Noun Phrase & Adposition

okane o
money ACC

If the uniformly ordered constituents were as different as their labels show them to be, we would not expect them to be uniformly ordered across languages. If they do exhibit linear likeness, this must be because they are alike in some way. Here are three proposals from the literature each of which envisages a different way in which the constituents whose order tends to be correlated across languages are reduceable to the same type.

(17) UNIVERSAL STRUCTURAL GENERALIZATIONS

(a) HEADS AND DEPENDENTS

In any one language, all **head** constituents tend to be ordered the same way relative to their **dependents**. (Bartsch & Vennemann 1972: 131-139, Vennemann 1973: 40-47)

(b) BRANCHING AND NON-BRANCHING CONSTITUENTS

In any one language, all **branching constituents** tend to be ordered the same way relative to their **non-branching** co-constituents. (Dryer 1992)

(c) MOTHER-NODE-CONSTRUCTING AND NON-MOTHER-NODE-CONSTRUCTING CONSTITUENTS

In any one language, all **mother-node-constructing constituents** tend to be ordered the same way relative to their **non-mother-node-constructing co-constituents**. (Hawkins 1994)

For Vennemann ((17a)), what defines the classes of uniformly ordered constituents is whether they are heads or dependents. Thus, verbs, adpositions, and nouns are heads, with their co-constituents being dependents. As already mentioned in section 0.2, for Dryer ((17b)), the relevant classificatory property is whether a category branches or does not branch. Verbs, adpositions, and nouns do not branch - they are single words - while their co-constituents do. Hawkins' structural principle ((17c)) is ultimately function-based: it calls for minimizing the number of words that it takes the hearer to identify the immediate constituents of a sentence when proceeding from left to right.

The operation of Hawkins' principle (called Early Immediate Constituents) is illustrated in (18) for verb-complement and adposition-noun phrase order for 'walk in parks'.

- (18) (a) [**Verb** [**Preposition** NounPhrase]_{PP}]_{VP}
 e.g. *walk in parks*
- (b) [[NounPhrase **Postposition**]_{PP} **Verb**]_{VP}
 e.g. *parks in walk*
- (c) [[**Preposition** NounPhrase]_{PP} **Verb**]_{VP}
 e.g. *in parks walk*
- (d) [**Verb** [NounPhrase **Postposition**]_{PP}]_{VP}

e.g. *walk* *parks* *in*

According to Hawkins' theory, the hearer wants to know as soon as possible that the verb phrase consists of a verb and an adpositional phrase. (18a) and (18b) are optimal in this respect. In (18a), in the space of the first two words *walk in*, the hearer gets the entire picture. From *walk*, he recognizes one of the immediate constituents of the verb phrase: the verb; and from the preposition *in*, which follows immediately, he constructs the prepositional phrase. In (18b), too, verb and adposition are adjacent. In contrast, in (18c) and (18d), these two mother-node-constructing constituents are separated: the intervening words put processing on hold.

Each of the three principles in (17) explains the particular implicational universals in (15) by subsuming them under more general principles of structure.

0.4. Universals as explananda: historical explanations

As was discussed in section 0.2, structural explanations are not causal: they do not provide a process which brings about something. Causal explanations of language structures - as of cultural constructs in general - must be historical. As we also saw in section 0.2, historical explanations must make reference to sources: earlier stages of the language, and to processes that are responsible for changing the old structure to a new one. Let us see what sources and processes could be found to explain language universals historically.

What are possible historical **sources** of universals? An **unrestricted universal** may simply have been inherited from an ancestral language. For instance, the fact that all languages have oral vowels may be due to the fact that the ancestral language(s) from which all languages derived had oral vowels - a possibly accidental property. (On how grammar might have arisen in the prehistoric evolution of human language, see for example Hurford et al. (ed.) 1998).

The source of **restricted universals** in terms of direct inheritance is more complex. Take first a **bidirectional implication**: the mutual correlation of two properties, such as that verbs and adpositions tend to be on the same side of their co-constituents, resulting in languages either having VO order and prepositions, or OV and postpositions. This cannot be explained by direct inheritance from a single ancestral language having one of the two patterns since that would leave the languages having the other pattern without a source. We would have to posit two source

languages - or two dialects of a language - each having one of the two patterns.

The explanation of **unidirectional implications** in terms of direct inheritance requires even richer assumptions about source languages. Regularities according to which "if a language has X, it also has Y." could not have been directly inherited either from a single original language or from two ancestral languages because they allow for three different language types while excluding one. For example, the universal according to which if a language has an /m/, it also has an /n/ amounts to the claim that there are languages with both /m/ and /n/, languages that have neither, and languages that have /n/ but no /m/ (but no language with an /m/ and no /n/). In order to explain this implication in terms of direct inheritance, three ancestral languages need to be posited: one with both /m/ and /n/, one without either, and one with /n/ but no /m/.

Let us now turn to the second necessary component of historical explanations: **processes** deriving a new structure from an old one. For universals, what we need to explain is why the inherited patterns have **not** changed in the course of history in spite of the pervasive transformations that languages undergo in the course of centuries and millennia. Why are universals never sources of historical change? For example, if an ancestral language had alveolar stops, why did they not disappear in at least some languages in the course of centuries and millennia? And if a universal is not absolute but only probabilistic, we have to explain why the original pattern has remained invariant in most languages but has changed in others.

These considerations show the complexities of explaining universals in terms of direct inheritance from ancestral languages (cf. Comrie 2003). Nonetheless, recent typological research has shown that crosslinguistic clusterings of grammatical properties are often confined to particular language families and to particular geographic areas (Nichols 1992, Bisang 1996, Blake 2001, Bickel 2005). Thus, the overall prevalence of clustering tendencies may indeed be due to inheritance from languages ancestral to a given language family or to extensive language contact.

So far, we considered explaining universals in terms of **universal sources and universal lack of change**. Below, we will see two cases of universals explained **by universal sources and universal constraints on change**.

0.4.1. The order of nominal and pronominal objects

Consider the following implicational universal as an explanandum.

(19) UNIVERSAL EXPLANANDUM

In all languages, if the pronominal object follows the verb, so does the nominal object. (Greenberg 1963: 25).

According to this generalization, there may be languages where both kinds of objects follow the verb (as in Modern English) and languages where both kinds precede the verb (as in Turkish); but if one follows the verb and the other precedes it - as in French - it is always the pronoun that precedes, not the noun. (20) illustrates the three permitted patterns.

(20) English

(a) I saw **Bill**.

(b) I saw **you**.

(21) Turkish:

(a) **Billi** gördüm.

Bill I:saw

(b) **Seni** gördüm.

you_s I:saw

(22) French:

(a) J'ai vu **Bill**.

I:have seen **Bill**

(b) Je **t'** ai vu.

I **you_s** have seen

Here is the historical background of (19). French is a daughter language of Latin, which tended to place both noun and pronoun objects in front of the verb as Turkish does today. English is a daughter language of Proto-Germanic, for which the same order pattern has been reconstructed. We can thus posit the following three historical stages (O_N stands for noun object, O_P stands for pronominal object; changes are in bold):

(23)	ORDER PATTERNS:		LANGUAGES:	
	O_N :	O_P :	ROMANCE:	GERMANIC:
Stage I:	O_NV	O_PV	Latin	Proto-

				Germanic
Stage II:	VO_N	O _P V	French	Old English
Stage III:	VO _N	VO_P	-----	Modern English

(23) shows that the change from preverbal to postverbal order of objects occurred in both language families and that in each case, nominal objects were in the vanguard of change with pronominal objects lagging behind. English has completed the change by extending it to pronominal objects, while French has not.

Thus, the French and Old English pattern can be explained by the hypothesis that in historical change, pronouns lag behind nouns. This is supported by independent evidence. In Old English, both nouns and pronouns had case, gender, and number inflection. In today's English, nouns still show number but they have no case inflection except for the genitive clitic 's, and they lost their gender inflection. Personal pronouns, however, still retain not only number but also some case and gender distinctions. The same thing happened in French case marking.

Note that the conservative nature of pronouns explains the universal in (19) only if we assume that OV-to-VO order is possible but VO-to-OV order is not. This is because in a VO-to-OV change, pronouns, being more conservative, would still be post-verbal when nouns are already preverbal - a synchronic stage excluded by (19). The non-occurrence of VO-to-OV is questionable in its unqualified form, however: Li & Thompson 1974 argued that Mandarin Chinese has undergone just this change and Ratcliff (2005) has shown the same for Bukhara Arabic. But the Mandarin case did not involve a direct re-ordering of verb and object and the change in Bukhara Arabic was induced by language contact. With appropriate qualifications, (24) summarizes the explanation of (19).

(24) UNIVERSAL HISTORICAL GENERALIZATION

Source: In all languages, in spontaneous historical change, the source of the direct inversion of verb and object is OV and not VO.

Process: In all languages, in historical change, pronouns lag behind nouns.

0.4.2. Definite articles and demonstratives

In most languages that have definite articles, the article's phonological shape is similar to that of a demonstrative. Examples are English *the* and *that*, German *der* and *dieser*, and Hungarian *a(z)* and *az*.

(25) UNIVERSAL EXPLANANDUM

Definite articles tend to be similar in phonological form to one of the demonstratives of the language.

The historical explanation is that definite articles most frequently develop from demonstratives (Diessel 1999: 128, Heine and Kuteva 2002: 109-111).

(26) UNIVERSAL HISTORICAL GENERALIZATION

Source: In all languages, the most frequent historical source of definite articles is demonstratives.

Process: In all languages, in the course of history, phonological form changes incrementally.

(26) is further derivable from a broader generalization. In the course of demonstratives turning into definite articles in certain contexts, two things happen: the demonstrative's phonological form is diminished and its meaning is generalized from spatial deixis to definiteness.

Formal and semantic reduction are symptoms also of other changes where a lexical item turns into a grammatical formative, such as in the development of the English future marker *will* from the lexical verb *will* 'want', or in the development of English prepositions (cf. section 0.2). The general process is called grammaticalization (cf. Pagliuca (ed.) 1994, Hopper & Traugott 1993, Givón 2002: 203-222, Newmeyer 1998, chapter 5, and the various articles of issue #23 of 2001 of the journal *Language Sciences*).

Grammaticalization is described in (27).

(27) UNIVERSAL HISTORICAL GENERALIZATION

Source: In all languages, functional elements tend to derive historically from lexical elements.

Process: In all languages, this change happens through incremental phonological and semantic reduction.

If we classify demonstratives as lexical elements and definite articles as functional ones, and if we further assume that definite articles developed recently enough so that phonological reduction has still kept the skeletal

phonetic properties of their source, (25) follows from and is thus explained by (26), which in turn is explained by (27).

0.5. Universals as explananda: functional explanations

Crosslinguistically consistent patterns of historical change can be readily identified; but what causes them? As noted in section 0.2, trying to explain historical change takes us back to synchrony: communally-shared language structures are shaped by the individual-based processes of language acquisition and language use.

Human cognition and physiology **cannot** be invoked as direct causes of synchronic language structure: the body and mind of an English speaker do not directly cause the grammar of English to be the way it is: the language is given to the speaker and to the language learner. Apart from instances of conscious "language engineering", the speaker is not like an architect that builds something from scratch and is thus fully in charge of what the structure will come out like; he is more like a person who inherits a house and perhaps re-models it a bit. Thus, the relationship here is only a permissive one: all synchronic language structure must be permitted by human cognition and physiology.

On the other hand, human cognition and physiology **must** be invoked as direct causes of

- **language use** (performance; how the person puts to use the language system he has acquired);

- **developmental change**: how the person acquires the language system he is exposed to; and

- **historical change**: how language is modified in the process of use and acquisition. Sources of change rooted in individual behavior are mis-perceptions, mis-interpretations, and changes in frequency of use (cf. Blevins 2005: 32-33). Although the changes are not brought about by single individuals but are caused by their cumulative effects (cf. Keller 1994), the processes are still rooted in the needs and capabilities of language learners and language users. Explanations of linguistic structures that show how the goals and means of language participate in bringing about historical change through the processes of language acquisition and language use are appropriately called **functional** explanations.

In the linguistic literature, functional explanations are often pitted against explanations in terms of the Innateness Hypothesis. This hypothesis holds that universal properties of languages are wired into the human brain and

they form a separate module apart from other aspects of cognitive capabilities (cf. Hoekstra & Kooji 1988, Penke & Rosenbach (ed.) 2004; Hauser et al. 2002). Thus, it has often been assumed that a universal grammatical feature is explained **either** by language function **or** by it being part of the innate linguistic endowment of humans.

However, explanations of language structure in terms of language function and in terms innate principles are not at odds. First, by the definition adopted here, explanations in terms of innate knowledge must be viewed as functional since they make crucial reference to cognitive means. Second, the innate properties may be goal-related: necessary or at least conducive to knowing and using language (cf. Kirby 1999, Chapter 5, Hawkins 2004: 267).

The compatibility of functional explanations and those appealing to innateness can be shown for the four universals discussed above. The tendency for grammatical structures to observe the principle of subadjacency (section 0.3.1) may be innate but at the same time it may be functionally-based: relating two positions in the sentence at a great syntactic distance may hamper comprehension (cf. Hawkins 2004: chapter 7). Similarly, the crosslinguistically uniform ordering of certain syntactic constituents (section 0.3.2) may ease parsing, as claimed by Dryer and Hawkins, but at the same time it may also be an innate preference. The resistance of pronouns to losing inflection and to changing position (section 0.4.1) can also be functionally explained: due to the frequent use of pronouns, inflection is merged with stem and thus ceases to be a separate morpheme that might get lost. Similarly, the pronoun ceases to be a separate word by getting stuck to the verb as a clitic and thus it cannot easily be repositioned by rules of word order. This explanation is functional but at the same time it may be linked to innate properties of the mind. Finally, the grammaticalization process that is responsible for the evolution of demonstratives into definite articles (section 0.4.2) is an instance of ritualization - a general process manifested in changes that non-linguistic symbols also undergo over time (Haiman 1994, Bybee 2005). This tendency is also a plausible candidate for innateness.

What does remain an issue separating the two approaches is whether the innate devices are "domain-specific" - i.e., applicable to language only (as generally assumed in explanations invoking innateness) - or whether the language-relevant cognitive properties of humans are the same as those operative in non-linguistic cognition (cf.

Newmeyer 2003, 2005, Tomasello 2003, MacWhinney 2004). While this is an empirical question, Occam's razor favors the latter.

Here follow two case studies of functional explanations of universals.

0.5.1. Resumptive pronouns in relative clauses

One of the ways relative clause constructions differ across languages is the way reference to the head is made in the relative clause. The relative clause may or may not include a pronominal copy of the head. English normally does not use such resumptive pronouns but Persian does.

(28) (a) English

the man that I gave milk to _____

(b) Persian

mardi ke man shir-râ be u dadâm
man that I milk-OBJ **to him** gave:S1
'the man that I gave milk to'

Keenan and Comrie (1977) have found that in those languages that use resumptive pronouns in relative clauses, the occurrence of the pronoun is predicted by the constituent type that is "relativized" - i.e., that is, understood as referring to the head of the relative clause. Here is the generalization, which at the same time serves as an explanandum.

(29) UNIVERSAL EXPLANANDUM

In all languages, on the scale of relativizable constituents, known as the Accessibility Hierarchy, if a language uses resumptive pronouns for any one type, it also uses them for all types to the right.

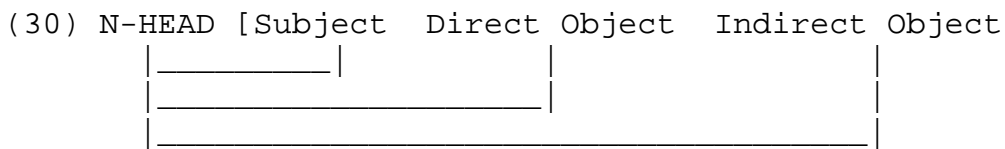
Accessibility Hierarchy

Subject > Direct Object > Indirect or Oblique Object >
Genitive

For example, if a language has constructions like *the book that I have read **it***, where the resumptive pronoun represents the direct object, it also has constructions like *the man that I have given the book **to him***, where the resumptive pronoun stands for the indirect object.

Hawkins offers a functional explanation for why this should be so. The hearer's task is to identify the referent of the co-referential noun phrase in the relative clause.

Not representing the referent by a pronoun in the relative clause is good for the speaker: for him, brevity is at a premium. But the interests of the hearer are different. If there is a pronoun to refer to the head, the expression is closer to diagrammatic iconicity, where each semantic argument is explicit in the syntactic structure (Keenan 1987) and is thus easier to understand. If there is no pronoun, finding the referent is more difficult and this difficulty increases with the distance between the head - called the filler - and the gap where the coreferential noun phrase would stand in a main clause. In languages where the order of major constituents is Subject & Direct Object & Indirect Object and the relative clause follows the head, this distance turns out to be small for subject relatives, larger for direct-object relatives and still larger in indirect-object relativization. This is shown in (30).



Thus, resumptive pronouns appear to step in to aid comprehension where relative clause structure gets more difficult to process.

Hawkins' functional explanation relying on filler-gap distance extends beyond relative clauses (1999, 2004, chapter 7). Another filler-gap construction is wh-questions where, as in English *What did you see?* etc., the wh-word is not in its subcategorized position. As we saw in our discussion of Subjacency (section 0.3.1), increased distance between filler and gap in wh-questions also results in reduced grammaticality.

Hawkins' overall hypothesis is that grammars in general respond to the complexity of filler-gap constructions: the distribution of gaps relative to their fillers is shaped by processing constraints. If a gap is permitted in a construction, it is also permitted in all simpler constructions of that type. If it is not permitted in a construction, it is also not permitted in the more difficult subtypes of that construction.

The particular universals captured by (29) are thus explained by the following general functional principle.

(31) UNIVERSAL FUNCTIONAL PRINCIPLE

For all languages, the more difficult a construction

to process, the more likely that the language will use a more explicit expression type.

In other words, “[g]rammatical conventions are ‘frozen’ processing preferences” (Hawkins 1999: 279).

As we noted above, functional principles cannot directly explain synchronic language structure since the language is given to its user and its learner rather than designed by them from scratch. Functional principles can only explain language change. How does (31) come to guide historical change? The key factor must be frequency (cf. Newmeyer 1998: 127, Haspelmath 1999, Kirby 1999: 20, Bybee and Hopper 2001, Bybee 2005): preferred structures are used more often and eventually become the only choice.

0.5.2. The case-marking of objects

Languages differ in how they case-mark direct objects. Hungarian is a language that case-marks all direct objects, shown on the example in (32).

- (32) *A kutya megharapja az ember-t.*
the dog bites the **person-ACC**
'Dogs bite people.'

At the other end, Lisu marks no direct objects. Since subjects are not case-marked nor are they differentiated from direct objects in other ways, subject-object ambiguity may arise as in (33). (simplified from Li & Thompson 1976: 472; TM = postposed topic marker)

- (33) *Làthyu nya ànà khùà.*
people TM **dog** bite
'People, dogs bite them.' OR
'People, they bite dogs.'

The picture becomes more complex if we look at Hebrew. Hebrew falls between Hungarian and Lisu in that it marks some direct objects but not others. In particular, definite direct objects must be case-marked by the prepositional clitic 'et but most indefinite ones may not (Aissen 2003: 453).

- (34) (a) *Ha-sere her'a 'et-ha-milxama.*
the-movie showed **ACC-the-war**
'The movie showed the war.'
- (b) *Ha-sere her'a milxama.*

the-movie showed **war**
'The movie showed a war.'

There is additional variation. Some languages - for example, Catalan and Pitjantjatjara - are more restrictive than Hebrew: they obligatorily case-mark only certain definite direct objects: (strong) personal pronouns (Catalan) and personal pronouns and proper names (Pitjantjatjara). The rule in Turkish in turn is more relaxed than the one in Hebrew: Turkish case-marks not only all definite direct objects but also indefinite objects provided they refer to a specific individual.

Here is the summary of the facts about the crosslinguistic distribution of direct-object case-marking:

(35) UNIVERSAL EXPLANADUM

In all languages, if direct objects of a certain kind are case-marked, so are all other kinds to the left on the following scale.

Personal	Proper	Definite	Indefinite	Indefinite
pronoun	name	common	specific	non-specific
		nominal	nominal	nominal

What explains (35)? Working within the framework of Optimality Theory, Aissen proposes that there are two universal constraints at work here: Iconicity and Economy.

(36) UNIVERSAL FUNCTIONAL GENERALIZATIONS

(a) THE ICONICITY CONSTRAINT

For all languages: given a markedness opposition of two nominals, the marked member should be case-marked (where a nominal of the scale in (35) is marked relative to all other nominals to its right).

(b) THE ECONOMY CONSTRAINT

For all languages: no noun phrase should be case-marked.

The two constraints are at cross-purposes: Iconicity requires case-marking under certain conditions while Economy bans case-marking under all conditions. They are both functionally-based: Iconicity serves clarity and thus the hearer's interests while Economy saves effort for the speaker.

How exactly do the two constraints - Iconicity and Economy - account for the crosslinguistic variability of direct-object case-marking? According to Optimality Theory, conflicts between constraints are resolved by ranking. For Lisu, the Economy Constraint reigns supreme: the language complies with it on all levels of the markedness hierarchy in that it does not case-mark even the most marked types of direct objects on the scale. Thus it violates all the requirements of Iconicity. Catalan, which case-marks pronominal direct objects only, is less insistent on Economy: it ranks it lower than the top requirement of Iconicity that calls for case-marking on the most marked direct objects: personal pronouns. Pitjantjatjara, Hebrew, and Turkish accord less and less role to Economy in favor of Iconicity. Finally, Hungarian discards Economy altogether and marks all objects.

As in the case of resumptive pronouns (section 0.5.1), the crucial links between function and structure must be frequency: functionally preferred structures are more frequent and with time they become conventionalized into grammars.

0.6. Conclusions

This paper has discussed the ways in which language universals play a role in explaining language structure. On the one hand, they serve as explanations of facts of individual languages. On the other hand, they call for explanations themselves. They may be explained structurally if they are derivable from a more general structural regularity; historically by appropriate assumptions about initial stages and historical processes; and functionally if they follow from the goals and means of humans as driving language acquisition and language use.

Our discussions highlighted some of the complexities of explaining universals resulting from conflicting explanatory principles especially with respect to functional explanations (Newmeyer 1998: 137-153, Frajzyngier and Shay 2003). The last case study above - the explanation of direct object marking - illustrates conflict between Iconicity and Economy, the latter favoring the speaker, the former serving the hearer. But not all conflicting desiderata result from the tug-of-war between speaker and hearer. In Natural Morphology - a framework to which the nature and resolution of conflicting principles is central - languages are held to three types of criteria which may be in conflict: compliance with universals, adherence to features of the type that a language belongs

to, and consistency with the language-specific features of a language (cf. Dressler 1997, 2003).

There are also other conflicting functions in language. While economy and ease of parsing may shape the development of novel structures, their propagation is often influenced by social factors which may be diagonal to structural desiderata. People may prefer structures that are used by prestigious speakers even if they are less communicatively effective (cf. Kirby 1999, Chapter 3, Nettle 1999, chapter 7, Croft 2000).

In addition to the complexity of attempting to explain universals functionally, there are also necessary limits to the task: we cannot expect all grammatical phenomena to be equally determined by language function, not even if they are universal (Newmeyer 2003). In thinking about functional explanations of instrumental objects in general, Sanders takes knives as an example of cultural constructs (Sanders 1977). He notes that while all structural properties of a knife have to be compatible with its function, not all of them are necessary for it. There are certain structural properties of knives - such as having a handle at all that is not made of cotton candy - that are **determined** by the knife's function. Others are **conducive** to its function but not necessary, such as a convenient length and shape of the knife's handle. This means that some functional principles may be tendencies rather than requirements. And, thirdly, a carved geometric pattern on the knife's shaft is merely **compatible** with but immaterial to its cutting function. Similarly, some grammatical properties may be necessitated by language function, others may be preferred but not necessary, and again others may be merely permitted by function without being indispensable or even advantageous.

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