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In honor of Anders Holmberg: Universality and variation in language

1 The Zero Hypothesis and GEFA

The language faculty is a biological capacity, and all humans share its initial stage, Universal Grammar (UG). This capacity is the common denominator of all human languages, including sign languages, visual or tactile. It stands to reason that this common denominator must be minimal. It cannot, in particular, contain any words or expressions in the regular sense. Consider the English expressions *mother* and *grandmother* and their Icelandic Sign Language correspondences (roughly) "one finger across forehead", meaning 'mother', and "two fingers across forehead", meaning 'grandmother'. "A finger across forehead" mimics a wrinkle of worry or concern in a mother's forehead and adding a second finger in the expression for 'grandmother' indicates second generation. Surely, none of these expressions are part of or directly provided by UG.

Questions arise. First, do these words express universal concepts – is for example MOTHER a universal, innate concept? I assume that this question has a positive answer: Yes, MOTHER is a universal concept, and, yes, it is innate, biologically given, not learned by experience.

Another question: Are basic concepts part of and thus provided directly by UG or are they part of another mind-internal but language-external department? I assume that the latter is the case and refer to the department or subsystem in question as the *Concept Mine*, "mine" as syntax "digs" into it in search of material (Sigurðsson 2011). UG and narrow internal syntax has access to the Concept Mine. Other animals have concepts and conceptual systems (see Gallistel 2011; Berwick & Chomsky 2011: 39; Tallerman 2014), which I take to show that concepts are distinct from language (although integrated into language as the individual matures). The *Syntax-Concept Access* is unique to humans, a prerequisite for the evolution of language. If the evolution of language involved only one mutation, yielding Merge (Hauser et al. 2002; Berwick & Chomsky 2011), then we would expect language to be a widespread biological property, contrary to fact. If it involved at least two unrelated mutations, yielding *Simplest Merge* (see shortly) and the Syntax-Concept Access, then its uniqueness to humans is immediately more understandable. While Simplest Merge seems to be widely found (Katz & Pesetsky 2011), the Syntax-Concept Access is an additional property, found in only humans. So, while Merge is the basic tool of internal syntax, language came into being by the Syntax-Concept Access.

UG, then, has no words or expressions in the regular sense, but does it contain items in some technical sense? Chomsky has long assumed that UG has what he refers to as "lexical items", but he has expressed disparate and conflicting views on the issue. Two of his suggestions are given in (1)–(2).

(1) **The Feature Array Approach:** In Approaching UG from below, Chomsky (2007: 6) suggests that "[i]n addition to Merge …, UG must at least provide atomic elements, lexical items, each a structured array of properties (*features*) to which Merge and other operations apply to form expressions."

(2) **The Single Item Approach:** In On Phases (2008: 139) Chomsky suggests "that a language has the simplest possible lexicon: just one LI [= Lexical Item], call it "one". Application of Merge to the LI yields {one}, call it "two". Application of Merge to {one} yields {one, {one}}, call it "three". And so on."

I adopt the Single Item Approach, with some specifications.

I refer to the single initial element as *Root Zero*, zero as it has no content. One can conceive of it as an empty cell that awaits being arbitrarily filled with some material from the Concept Mine, for example the concept MOTHER (yielding [$\sqrt{\text{mother}}$]). As soon as Root Zero has been filled, thereby becoming Root One, the language faculty creates a copy, making Root Zero available anew, this new copy awaiting to get arbitrarily filled with some content, yielding Root Two, and so on.

In addition to Root Zero, UG must provide the Edge Feature, as argued by Chomsky in On Phases. I quote Chomsky on this in (3).

(3) Chomsky (2008: 139):

For an LI [= Lexical Item] to be able to enter into a computation, merging with some SO [= Syntactic Object] … it must have some property permitting this operation. A property of an LI is called a *feature*, so an LI has a feature that permits it to be merged. Call this the *edge-feature* (EF) of the LI. … The fact that Merge iterates without limit is a property at least of LIs – and optimally, only of LIs, as I will assume. EF articulates the fact that Merge is unbounded, that language is a recursive infinite system of a particular kind.

I refer to the Edge Feature, in the singular, as *Edge Feature Zero*. Like Root Zero, it may be filled with content from the Concept Mine and copied or multiplied. Refer to this Root Zero + Edge Feature Zero approach as the *Zero Hypothesis*. The conceptual content of edge features, in the plural, is typically vaguer than that of roots, though, an issue I will return to.

Edge features, in the plural, are building elements, like roots, and what we may properly refer to as lexical items is formed by merger of roots and edge features (for example [n-$\sqrt{\text{mother}}$]). I assume that edge features are involved in any instance of internal and external Merge, any structure building. It follows that symmetric structures in the sense of Moro (2000) and Chomsky (2013) are impossible, not because they cannot be labelled, but because they cannot be formed in the first place. An edge feature must be part of any application of Merge, so the formation of seemingly symmetric structures, such as small clauses of the form [XP, YP], must involve one or more silent edge features, as sketched in (4).

(4) [XP [EF^{n} [YP]]]

A unit or a structure may merge with a single edge feature, but, as indicated by the n-superscript on EF in (4), there is in principle no upper limit to the number of edge features merged. Edge features come for free, and multiple specifiers must each merge with at least one edge feature ([EF^{n} XP [EF^{n} YP […]]]). Stacking without edge features is precluded. Call this the *Generalized Edge Feature Approach*, GEFA (which is accidentally the spelling of the Icelandic verb *gefa* meaning ‘give’).

(5) GEFA: Any application of Merge involves at least one edge feature

GEFA assumes Simplest Merge, not calling on any extra stipulations or tools. It might be too simple, but I optimistically assume that it is correct.

Basic lexical semantics is provided by the Concept Mine, via syntax, while additional semantics is provided by pragmatics in the broad sense, arising at the semantic interface from the interaction of syntax with other mental systems and the context. Obviously, though, the semantic interface has access to syntactic/lexical semantics, molding it with pragmatics (as we will see for Gender). That is, the Concept Mine is directly accessed by syntax, and then indirectly accessed by the semantic interface, via syntax.

This much seems clear. However, in other respects, the nature of the semantic interface or the conceptual-intentional interface, C-I, remains poorly understood, but I will not dwell on

that here. I simply adopt the view, following Berwick et al. (2013: 90) and others, that the semantic interface is post-syntactic (distinct from internal syntax, which is often referred to as Logical Form, LF), taking, in the words of Berwick et al., "the mental expressions formed by syntactic rules" as input, connecting them to each other across context and also to "other properties of the internalized 'mental world'."

2 Syntactic features are *not* selected

All this is universal. On a biological view of the language capacity that makes sense. Assume it to be correct. How do we then understand language variation? One rather traditional way of conceiving of this issue is the Feature Selection Approach in (6).

(6) **The Feature Selection Approach:** In Derivation by Phase (2001: 10) Chomsky suggests that the Faculty of Language (FL) "specifies the features **F** that are available to fix each particular language L … We adopt the conventional assumption that L makes a one-time selection [F_L] from **F**. These are the features that enter into L; others can be disregarded in the use of L".

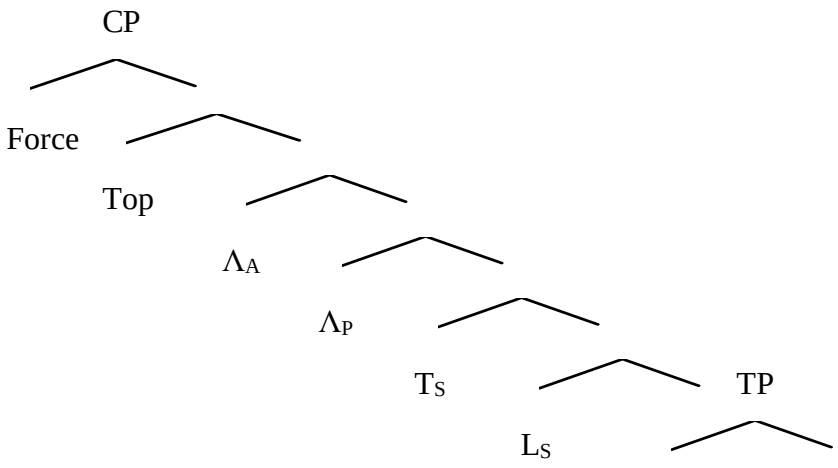
The Feature Selection Approach relates to the Borer-Chomsky conjecture, formulated by as in (7) by Chomsky; see also, for example, Baker (2008: 156) and Roberts & Holmberg (2010: 32):

(7) **The Borer-Chomsky Conjecture** Chomsky (2001: 2):
… parametric variation is restricted to the lexicon, and insofar as syntactic computation is concerned, to a narrow category of morphological properties, primarily inflectional.

On the Feature Selection Approach, UG contains a universal pool of features **F**, from which languages each make their own specific selection. However, that is a gross simplification. Selection hardly applies to, say, C, v, n. Given the Zero Hypothesis, the content of entities such as C and v, inasmuch as they do have content, is not provided by UG but by the extra-linguistic Concept Mine. In fact, so-called functional "heads", including, for example, C, v, D, n, are not discrete entities or items but domains that contain an array of elements that are each below the level of materialization, like quarks, and at least many such quarks, perhaps all, are variables rather than constants.

Consider C, for example. On the *context-linking* approach, argued for in previous work (e.g., Sigurðsson 2014, 2019), C contains a number of edge features that are like quarks, referred to as *edge linkers*. This is sketched in (8).

(8)



Λ_A = Logophoric Agent ("speaker"), Λ_P = Logophoric Patient ("addressee")

T_S = Speech Time, L_S = Speech Location (and T_S + L_S = Fin)

This is too simple a picture of the clausal left periphery, but I set that aside here. Importantly, all these elements are below the level of materialization – none of them is ever independently spelled out in any known language. It follows that the structure in (8) is not only incomplete but also overly specific; as the C-categories are below the level of materialization, their order and hierarchical correlations are undecidable, which is the reason why researchers commonly operate with C as a cover term.

It might seem to be a puzzle or even a contradiction that these elements cannot be independently spelled out, but it is evidently a fact. Thus, no language is known to separately spell out a Logophoric Agent *I*, Speech Time *now*, Speech Location *here*, as in: *I now here Prices slumped*, instead of *Prices slumped*, and so on (see Ross 1970: 224; Sigurðsson 2014). This cannot be a coincident. In this respect, the clausal edge features are like the relators in den Dikken 2006, the silent elements that relate predicates and their subjects in den Dikken's approach. The reason is that these silent elements mediate relations; if they were spelled out in situ they would presumably be interpreted in situ and thus be unable to function as relators or linkers.

C is a domain of largely silent categories that are either not materialized at all or jointly materialized. Thus, it is commonly spelled out as underspecified elements, such as *that* and *if*, or completely silent, see (9).

(9) a. [$_{CP}$ __ [$_{TP}$ John was dancing]]
b. I believe [$_{CP}$ __ [$_{TP}$ John was dancing]]

Language, then, is full of silent elements, dark matter, like the universe. The Generalized Edge Feature Approach, GEFA, crucially assumes that edge features come for free and are not individually or separately spelled out.

Feature Selection is not in principle excluded by or incompatible with the Zero Hypothesis. However, edge features, including the ones in (8), are not selected. They are universal, part of any human language. Thus, for example, Speech Time enters the computation of Tense in all languages, Logophoric Agent and Logophoric Patient enter the computation of Person in all languages, and so on, regardless of how the categories of Tense and Person are expressed. Consider the simple clause in (10).

(10) I saw you here yesterday.

That edge features, such as Speech Time, are not lexical constants but variables is simply evidenced by the fact that utterances, for example the one in (10), may have infinitely many interpretations, depending on who addresses whom, where and when (see, for example, Banfield 1982).

Edge feature variables, such as Speech Time, get interpreted at the semantic interface in relation to the context and simultaneously in relation to clause internal elements, such as Event Time. They are relational. T_S is normally valued as identical (simultaneous) with the speaker NOW under control (context scanning), as sketched in (11).

(11) NOW [$_{CP}$ … T_S ...]
↑_ _ _ _ _ _ _ _ _ ↑ Control (yielding identity)
identical

Clause-internal Event Time and Reference Time (in the sense of Reichenbach 1947), here denoted as T_E and T_R, are in turn computed in relation to the T_S value, as past, non-past, and so on. I illustrate this in (12) for the *past-in-the-past* reading of a past perfect clause.

(12) Mary had written the letter.

$[_{CP}$ … T_S ... $[_{TP}$ ... T_R ... $[_{vP}$ ... T_E ...]]] Past-in-the-past: $T_S > T_R > T_E$

had *written*

↑_____↑↑_____↑ Agree (yielding valuation)

past past

Tense computation is syntactic, crucially involving the silent Speech Time C-edge linker, which is computed both in relation to the context and the clause internal Tense elements. The computation of Person proceeds in a similar manner, relating the logophoric C-edge linkers to clause internal elements, and close parallels have been argued to hold for Case and Gender as well (Sigurðsson 2012, 2019). To repeat, none of this is selected, into or out of syntax. It is all there in the syntax of all languages.

3 Morphological features *are* selected

Obviously, though, categories such as Tense, Person, Case, and Gender are differently externalized in different languages. Take Gender, for example. More than half of the languages in Corbett (1979; 1991), 145 out of 257, have no grammatical genders. However, even languages that lack grammatical gender have semantic lexical gender. Finnish *tyttö* 'girl', *poika* 'boy', and so on. Semantic or conceptual features that enter grammatical gender systems, such as HUMAN, ANIMATE, MALE, FEMALE, are, unsurprisingly, universally accessible in the Concept Mine. When Finnish syntax forms the noun *poika* 'boy', it merges the root $\sqrt{\text{poik}}$ with edge features, including *n* and a gender feature, yielding (13).

(13) $[g_{MALE}$ [n - $\sqrt{\text{poik}}$]]

Gender is thus present in Finnish syntax, hence interpretable at the semantic interface. However, it is grammatically silent. Actually, it is a peculiar property of gender in many gender languages that it is locally invisible on the noun itself, while being visible at distance via gender

agreement. So, what Finnish lacks is not syntactic Gender, but morphological gender values and hence also agreement processes that take such values as input.

How can it be that elements that enter meaningful relations in all languages are invisible, remain non-externalized in many, sometimes most or even all, languages? That leads us back to Feature Selection. There is no cross-linguistic Feature Selection in syntax, but there *is* such selection in PF, the externalization compartment. That is where variation arises (Sigurðsson 2000 and subsequent; Berwick & Chomsky 2011; Boeckx 2011). Thus, Icelandic and Italian, for example, select to express the feature [masculine] in inflectional morphology, while Finnish selects not to do so. In this sense, Gender is grammaticalized in Icelandic and Italian, as opposed to Finnish. I use the notion "grammaticalized" in this informal sense, as stated in (14).

(14) A formal feature is grammaticalized if it is systematically expressed or has systematic correlates in PF

So, languages vary as to which features they grammaticalize. Any formal feature "grammaticalization decision", thus, involves a parametric valuation that takes the general form in (15).

(15) Grammaticalize formal feature X

As we will see, though, the notion "formal feature" is distinct from, albeit related to, the notion "syntactic feature". However, as formal features have a syntactic base, it follows that all formal feature grammaticalization has a syntactic base, and as initial syntax (UG) is uniform across humans, it also follows that all grammatical markings reflect syntactic features that are accessible in all languages, even languages that never show any markings for the features or categories in question. This follows Cinque (1999, 2013) in spirit, but I do not take stand on how the order and potential hierarchical relations of features come about. Let me just point out that grammaticalization affects learnability. It is generally hard for learners to master a category in a foreign language that is not grammaticalized or differently grammaticalized in their native language, for example Gender. However, purely syntactic features such as Speech Time and Logophoric Agent never seem to pose any second language learning problems, naturally so if they are innate and do not require any externalization learning.

4 Categories, features, parameters, rules – and the case of Gender

"Formal feature" in (14) and (15) has two senses. It refers to categories, such as Case and Gender, as well as their values, such as [dative] and [feminine]. See Adger & Svenonius (2011) and Roberts (2019). Feature values are somehow hierarchically ordered under their respective categories or attributes, as discussed for Person in a 2002 paper in *Language* by Harley & Ritter: [accusative], [dative], and so on, are ordered under the category of Case, while [masculine], [feminine], and so on, are ordered under the category of Gender. We have no clear understanding of how and where this ordering or grouping comes about; as pointed out by Harley & Ritter (2002: 518), it is unclear how their morphological feature geometry relates to syntax. Major categories, Case, Person, Tense, Gender, and so on, seem to be the co-operative products of syntax and the externalization compartment. That they are not purely syntactic is simply evidenced by the fact that they do not get purely semantic interpretations. The masculine and feminine genders commonly mark males vs. females, but, as we all know, there are loads of exceptions. Italian *luna*, German *Mond*, Icelandic *tungl* all mean 'moon', but *luna* is feminine, *Mond* is masculine, and *tungl* is neuter.

The Gender category plausibly has a syntactic base in all languages, but the gender values partly live their own lives in morphology. Conversely, semantic gender is detectable even when not marked in a noun phrase or on a pronoun, so Gender is both syntactic and post-syntactic, an issue I will return to shortly.

The basic parameter that underlies Gender systems takes roughly the form in (16).

(16) Grammaticalize Gender markers

If this is right, then the underlying Gender category must be an abstract variable, open to a number of values, including [feminine] and [common gender], for example. (16) is a macro parameter in the sense of Baker (2008); Roberts & Holmberg (2010); Roberts (2019), and given the approach pursued by these researchers, in particular Roberts (2019), it relates hierarchically to a number of micro parameters. One such micro parameter or sub-parameter must range over gender values, [animate], [feminine], and so on, and another one must specify which parts of the lexicon are amenable to gender markings. In addition, gender parameters interact with agreement parameters. For example, predicative adjectives and past participles show gender agreement in Italian and Icelandic, but not in German. Only determiners partake in gender concord in Swedish, while almost any DP-internal modifier does in Icelandic. And so on. Sorting all this out from a hierarchical parametric perspective is not an easy task. As far as I am aware of, no one has ever tried to.

Parameters alone cannot account for or describe all variation. Reasonably, early acquisition proceeds largely by sweeping parameter settings, but the settings are soon complemented by numerous rules of exceptions, due to irregularities in the linguistic input (see Yang 2016). One type of variation that is arguably unrelated to parameter settings is inflectional class variation, of verbs, nouns, and so on, in many languages (see Svenonius 2007). I will not dwell on rules of exceptions here, so I only mention one other peculiar example. Regular Icelandic adjectives and past participles have 144 feature combinations: 4 cases, 3 genders, 2 numbers, 3 degrees, 2 "strengths" (roughly definite vs. indefinite), and these combinations are expressed by 30 distinct forms. For illustration, "only" the 12 combinations and the 10 different forms of the adjective/participle *komin-* 'arrived' in the simple positive "strong" singular inflection are given in (17).

(17)

	NOM	ACC	DAT	GEN
M.SG:	kominn	kominn	komnum	komins
F.SG:	komin	komna	kominni	kominnar
N.SG:	komið	komið	komnu	komins

However, all this richness is wiped out in case the adjective has a non-monosyllabic stem that ends in a vowel: bisyllabic, as *hiss**a*** 'surprized', and so on. This is a rule of exception. Adjectives of this sort reject all inflection. So, after having learned parameter settings and rules that yield regular adjectival agreement inflection, Icelandic children learn that none of these apply for non-monosyllabic adjectives with a stem in a vowel. The complete absence of inflectional morphology in such adjectives means that they are just like English adjectives. Even in Icelandic, then, inflection is syntactically unnecessary – it is not regulated in syntax (as underlined by the existence of inflectional classes). Inflection is reasonably based on syntax and parameter settings, by and large at least, but the parameters are externalization parameters, and the inflection itself takes place in the externalization compartment, commonly referred to as PF.

Grammatical categories, Case, Tense, and so on, are both syntactic and post-syntactic. We have seen this for Tense. Let me illustrate this syntax-morphology interaction further for only Gender. The semantic or conceptual features MALE/FEMALE are syntactic, incorporated into syntax from the Concept Mine, but [masculine/feminine], and so on, are post-syntactic morphological features, formal features. Only some nouns have syntactic/semantic MALE/FEMALE gender, while, typically, all nouns in gender languages have some formal,

morphological gender (Greenberg 1978). However, if Gender was entirely non-syntactic, only a morphological or a lexical/morphological quirk, as sometimes assumed, then we would not expect semantic/syntactic MALE/FEMALE gender to ever have any morphological effects that are independent of formal gender. However, this is not so. There are numerous and various cases of semantic MALE/FEMALE gender alone triggering gender agreement, without any aid of formal gender. This phenomenon has been widely observed and discussed (by Corbett 1991 and others) for animate nouns that lack MALE/FEMALE gender semantics and may thus refer to individuals regardless of biological sexes: *doctor*, *minister*, *hero*, *poet*, *dog*, *horse*, and so on. An Icelandic example is given in (18).

(18) Læknir-**inn**/*-in/*-ið var mjög ánægður/**ánægð**/*ánægt.
doctor-the.M/*F/*N was very pleased.M/F/*N
'The [female] doctor was very pleased.'

The noun *læknir* 'doctor' is a masculine noun, triggering obligatory DP-internal concord, as on the suffixed article in (18). When the 'doctor' referred to is a male, the predicative adjective is also obligatorily masculine, *ánægð**ur***. However, when the 'doctor' in question is a female, as in (18), the predicative adjective may either heed formal masculine agreement or show up in the feminine, *ánægð*, by semantic agreement. The DP containing the noun is assigned semantic/syntactic FEMALE value at the DP-level, above the n-level (where [masculine] is assigned), and it is this value that triggers the optional feminine agreement of the predicate, overriding regular formal agreement.

First and second person pronouns in Icelandic, as in most other languages (Siewierska 2004), have no formal gender, but they have semantic gender that triggers obligatory predicate agreement. This is illustrated for only the first-person singular pronoun *ég* in (19).

(19) a. [A male speaking:]
Ég er **ánægður**/*ánægð.
I am pleased.**M**.SG.NOM
b. [A female speaking:]
Ég er **ánægð**/*ánægður
I am pleased.**F**.SG.NOM
Both: 'I am pleased.'

Strikingly, the same applies to speaker-inclusive PRO (Sigurðsson 2019), as illustrated in (20).

(20) a. [A male speaking:]

Það er mikilvægt fyrir mig_i [$_{CP}$ að [$_{DP}$ PRO]$_i$ vera **ánægður**/*ánægð].

it is important.N.SG for me C be pleased.**M**.SG.NOM

b. [A female speaking:]

Það er mikilvægt fyrir mig_i [$_{CP}$ að [$_{DP}$ PRO]$_i$ vera **ánægð**/*ánægður].

it is important.N.SG for me C be pleased.**F**.SG.NOM

Both: 'It is important for/to me to be pleased/content.'

While semantic gender values, such as MALE and FEMALE, are incorporated into syntax from the Concept Mine, thereby becoming syntactic, formal gender features like [masculine] and [feminine] are post-syntactic, assigned in morphology.

Gender, whether formal or purely semantic/syntactic, relates CP-external discourse participants and CP-internal event participants. We see this for formal gender in examples like the simple Icelandic and Italian sentences in (21).

(21) a. $Bókin_i$ er spennandi. Ég kaupi **hana**$_i$.

book-the.**3F.SG.**NOM is interesting I buy "her".**3.F.SG.ACC**

b. Il $libro_i$ è interessante. **Lo**$_i$ compro.

the book.**3.M.SG** is interesting "him".**3M.SG.ACC** (I) buy

Both: 'The book is interesting. I am buying it. / I will buy it.'

There are two sides to the coreference and the forms of the pronouns in (21). First, the pronouns inherit or recycle the ϕ-values of their antecedent under context scanning (control). Second, the context-bound ϕ-values of these pronominal elements are computed in relation to *local* case, yielding the **3.F.SG.ACC** form *hana* and the **3.M.SG.ACC** form *lo*, respectively. This computation of external ϕ-values + local case is syntactic.

Evidently, gender assignment and gender agreement in the examples above is sensitive to the context. Somehow, gender from the outside context enters CP syntax, triggering morphological agreement within the CP. In view of the widely adopted credo, since *Syntactic Structures* (Chomsky 1957), that syntax is context free, this is a truly intriguing phenomenon, but it has raised remarkably limited interest in the minimalist literature. According to the analysis in Sigurðsson (2019), CP-external gender enters CP syntax by *edge computation*, as informally defined in (22).

(22) *Edge computation*

For any phase edge, P_E, it holds that:

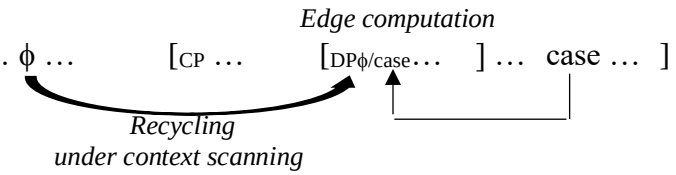
a. P_E has syntactically active edge linkers

b. P_E recycles features (properties) from the phase context via the edge linkers.

c. The so recycled features are computed at P_E in relation to an element or elements in the inner phase.

Edge linkers, perhaps edge features in general, are variables, valued in the syntactic process. Thus, gender at the DP-level, is a variable that is valued under contextual control or context scanning, whereby contextual gender is recycled and subsequently computed in relation to CP-internal elements, including case, as sketched in (23) (cf. (29) in Sigurðsson 2019: 743).

(23)



Gender relates CP-external discourse participants and CP-internal event participants, so the reason why gender features are computed in relation to case is plausibly that case, in turn, relates to the θ-roles of event participants.

5 The syntax-to-PF-morphology metamorphosis

Morphology is based on syntax, but it is also split from it. In Distributed Morphology, it is assumed that there are abstract morphemes such as [past] that are primitives, "drawn from a universal feature inventory", as Embick & Noyer (2007: 296) put it, but that is off the track. Past is a relation in syntax, and not a building block until in morphology. Syntactic features like T_S, T_E, are quite distinct from morphological features like [past]. Due to physical constraints on externalization modes, audible, visible, or tactile, morphological objects are bound to be discrete, like for example the English past tense marker *-ed*. Internal syntax, on the other hand, works with syntactic relations and elements of thought (cf. Berwick & Chomsky 2011), such as the Tense atoms T_S,T_E, and T_R, and computes relations between such elements, across domains. We all know that phonology is radically distinct from morphology, although the former represents the latter (Burton-Roberts 2011). Morphology is also distinct from syntax, albeit not as radically. The relation between the two, arising under transfer, is reminiscent of

incomplete metamorphosis; I refer to it as the *syntax-to-PF-morphology metamorphosis*. The computed syntactic relations between T_S,T_E, and T_R are expressed by elements like the past tense marker *-ed*, but such markers are not the same elements as the Tense atoms. There is a closer affinity between semantic/syntactic MALE and morphological [masculine], but the two are crucially not the same, as underlined by the fact that many gender languages operate with [common gender], and not with [masculine] – and there are also languages that operate with both, such as Dutch and Swedish. Dependent case expresses the relation between an argument DP and its syntactic environment, but this relation is not the same as morphological [accusative], although it is commonly expressed or marked by the accusative, and so on and so forth (Sigurðsson 2004 and subsequent). There is a long-standing tradition in the generative paradigm to ignore the syntax-morphology metamorphosis, and to treat morphology as if it were part of syntax (most famously Halle & Marantz 1993, and Chomsky 1995, albeit in different ways). That is not so. It is high time that we recognize the syntax-to-PF-morphology metamorphosis.

Morphology operates with elements of expressions, syntax with structural relations and elements of thought, so neither is part of the other, although they are interrelated. Edge features are structural objects and also elements of thought, linking syntactic domains, but they are *necessarily silent* themselves. Perhaps even more surprisingly, in view of common assumptions to the contrary, is that *they do not have any semantics on their own* (Sigurðsson 2014: 181). Their computed relations with other elements are interpreted at the semantic interface, but the features that enter the computation are not separately interpreted. For example, T_S, Speech Time, does not get any interpretation unless it relates to some T_E, Event Time. Semantic/syntactic MALE and FEMALE might seem to be different from the Tense atoms in this respect, but they are not. They relate discourse participants and event participants across clause boundaries, and they can only be interpreted in such a relation.

6 Concluding remarks

Initial syntax is uniform, but languages are variably outspoken or variably silent about syntactic features, the elements of thought. Language variation takes place in the externalization compartment, broad PF, but it is based on syntax. Questions arise, many of them unanswerable at the current state of knowledge. The syntax-to-PF-morphology metamorphosis is mysterious. Most acutely, it is unclear how semantic/syntactic features, such as MALE and FEMALE, get transformed into morphological features like [masculine], [feminine], and also why syntactically based morphological features commonly express properties that are only vaguely

related or even seemingly unrelated to the semantics of the underlying syntactic features. A related issue is in a way the opposite: It is unclear why some syntactic features, such as MALE and FEMALE, sometimes, but only sometimes, get entirely unaltered "through" transfer from syntax to morphology. Also, as parameters are not provided by UG, the question is where they come from, how they arise. Parameters operate with or on selected PF features, and not on unselected purely syntactic features, so, parameter setting is plausibly closely tied to the syntax-to-PF-morphology metamorphosis. Relevantly, parametrization does not take place when and where syntactic features get unaltered through transfer (no metamorphosis): While the Italian and Icelandic nouns meaning 'moon' trigger different predicate agreement, first and second person pronouns (overt or null, including PRO), with only semantic/syntactic gender, trigger exactly parallel gender agreement in both languages. Males speaking: '(I) am content.M/*F', females speaking: '(I) am content.F/*M', and so on.

It seems, then, that parameters are on the externalization side of language, part of or related to the sensory-motor system, facilitating motoric learning in language acquisition. If so, language parameters presumably have parallels in other motoric systems and motoric activities in both humans and non-humans, including for example music and birdsong (see Berwick et al. 2011 on birdsong). That is where we should look for a deeper understanding of parameters and parametric variation. However, morphological and word order parameters are special, in that they operate on the output of internal syntax, which is unique in the biological world. According to Berwick et al., birdsong has "phonological syntax", partly resembling human PF structuring, but birds do not have any Syntax-Concept Access.

In *The philosophy of grammar*, Jespersen famously stated that "no one ever dreamed of a universal morphology" (1992: 52), and Chomsky cited this statement in *The Minimalist Program* (1995: 3), and also in a preliminary version of Approaching UG from below (2007), but he deleted it in the final version of that paper, and, to my knowledge, he has never repeated it since. Perhaps, he concluded that it was too pessimistic. Let us remain hopeful and continue to believe, in the spirit of Anders Holmberg, that externalization variation can be fruitfully analysed as a reflection of general principles and the universal language capacity.

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