Tense, mood, and aspect sequencing: The universals FDG and Cartography can't escape*

Enoch Oladé Aboh
ACLC, University of Amsterdam

1 Introduction

My journey with Kees Hengeveld began in September 2000 when he welcomed me to the Department of Linguistics at the UvA. A generativist graduated from the University of Geneva, I was hired as a postdoc on a project on the development of Suriname creoles, under the supervision of Norval Smith and the late Pieter Muysken. During this first encounter, I immediately felt I was warmly accepted in the department: my contributions mattered just as much as anybody's. Well, let's say it: I did not get that typical Western eyebrow-raising meaning "how come this African landed in a temple of knowledge like this?" I was obviously intimidated, given the long list of famous linguists I had heard of or read about who had been in this same temple, and some of whom became my colleagues. This sense of being a legitimate member of the group never left me since, as I passed academic hurdles during my UvA career.

The feeling of truly belonging to a group of talented scholars interested in the 'big questions' about the human language capacity fed into a long friendship and collaboration with Kees. With a background in comparative syntax, I have a taste and respect for typological work, something that Kees probably felt in me, and which has sustained our friendship, intellectual intercourse and professional collaboration since. Without getting into the details of all the wonderful moments we shared (over *borrels*), a constant thread through the twenty

* I have had very many occasions to express my gratitude to Kees as a mentor and a role model. Collaborating with him has been an immense source of inspiration in my academic and personal life. As he might recall, I taught a Master course at the Université de Port au Prince, Haiti in July 2014. After a couple of sessions, one of the students approached me and asked if I knew /*kɛs hangelvɛld*/ (pronounced in the Haitian-French way). I first said "no" before realising he meant our Kees. I then told him Kees was a good friend and colleague of mine, to which the student responded "He saved my life. I read his work and that saved my life because I understood linguistics". This was the first time I was told that a linguist, however famous, had saved anybody's life! I then noticed, I too gained nobility and credibility from this student for just being Kees' friend and colleague. Thanks Kees for being you!

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something years of collaboration was the (r)MA courses we co-taught. This collaboration gave us many opportunities to discuss aspects of our research, including general questions about cross-linguistic variation and how this could be analysed in FDG compared to cartographic views in Generative Syntax. It is not exaggerated to say that despite the apparently incommensurable stances of these two approaches, we would often conclude that they face the same fundamental questions. Even more exciting, the solutions they propose are often very similar, once one peels off the complex notations linguistic theories commonly dress up with. Section 2 briefly describes two courses we cotaught and a topic we discussed in a recent past: the cross-linguistic expression of Tense, Mood, and Aspect (TMA). In section 3, I argue that findings in Cartography and FDG suggest only one alternative: TMA sequencing is a true universal. Section 4 concludes this squib.

2 Perspectives on universals and the syntax and semantics interface

Our teaching collaboration began with an (r)MA course, *Perspective on Universals 2*, in which students were introduced to cross-linguistic variation, with the two lecturers bringing the perspectives from FDG and comparative syntax. Students' final papers involved grammatical sketches and theoretical analyses inspired by class discussion. Topics covered in this course included "information structure", "question formation", "adpositions", and "TMA sequencing". Subsequently, we developed a course focused more on theory, *Syntax and Semantics Interface*, which introduces (r)MA students to how language phenomena are analysed in FDG and Generative Syntax using cartographic methodology. The two frameworks appear far apart when considering their theoretical underpinnings and notational tradition, yet their accounts of TMA sequencing converge, thus suggesting the existence of a core property of the human knowledge of language (e.g., Baker 1985; Hengeveld 1989; Cinque 1999; Ramchand & Svenonius 2014).

There are many typological tendencies (e.g., thematic hierarchy, word order biases) which linguists argue about, and which do not often allow any firm conclusion regarding what the child brings to the language learning table. Since the early 80s, however, linguists have noticed certain regularities about TMA sequencing which require explanation. Indeed, work by Bickerton (1981), Muysken (1981), Foley & Van Valin (1984), Baker (1985), Bybee (1985), Hengeveld (1989), and Cinque (1999) has shown that the morphological type of a language does not determine the structural make-up or scope hierarchy of its TMA sequencing. The examples below demonstrate this.

(1) a. Hidasta, Siouan
Wíra i apaari ki stao ski
tree it grow INCH REM.PST EVID
'The tree must have begun to grow a long time ago.'
(Hengeveld 2006: 53)

b. Ute, Uto-Aztecan
Tukua-tuka-na-puga-vaaci.
meat-eat-HAB-PST-EVID (hearsay)
'(She) used to eat meat (so I hear).'
(Cinque 1999: 56)

c. Ibibio, Benue-Congo
M-ma-si-sak n ka do.
AGR-PST-HAB-still go there
'I still used to go there.'
(Cinque 1999: 70)

d. Saramaccan, Creole
A bi o sa ta wooko.
3SG PST MOOD MOOD ASP work
'He could have been able to work.'
(Veenstra 1996: 20)

Hidatsa (1a) is isolating, while Ute (1b) is agglutinating, yet both languages display the same ordering: Verb-ASPECT-TENSE-MOOD. This is the mirror image of the ordering in Ibibio (1c) and Saramaccan (1d) where TENSE precedes ASPECT. Saramaccan further shows that modals may follow TENSE, hence the order TENSE-MOOD$_{1,2}$-ASPECT. The languages in (1) therefore show that modals can precede or follow TENSE. Irrespective of their morphological type or typological and/or genetic distance, these languages display a single ordering MOOD-TENSE-MOOD$_{1,2}$-ASPECT (MTMA).[1].

As has already been concluded in typological and generative studies, this rigid MTMA sequencing strongly suggests a unique semantic hierarchy that presumably constrains language learning. This much, Kees and I teach our (r)MA students further showing how insights from both Cartography (Rizzi 1997: Cinque 1999) and FDG converge, complement each other or force linguists to ask similar questions. Where the 'honey moon' typically ends is when students insist on knowing whether the described semantic hierarchy and

[1] In this paper, I use the label TMA to refer to the broad categories tense, mood, and aspect, while MTMA refers to the rigid ordering.

the structure it correlates with is given or rather emerges under communicative pressure. In what follows, I will try a non-diplomatic answer which Kees probably anticipates already: there is no other way out than conceding that this particular aspect of grammar is given. In Aboh (2020), I thus conjecture that

> "[t]he language instinct is biased toward a specific MTMA sequencing. This knowledge is innate, hence the typological astonishing uniformity."

3 Why TMA expression must be given

Hengeveld (2006: 53) proposes the schema in (2) to illustrate the pattern just described in (1), where 1 to 5 stand for specific TMA expressions.[2]

(2) 5 4 3 2 1 **stem** 1 2 3 4 5

According to (2), V-final languages (1a-b) tend to realize the order to the right of the stem, while V-initial languages (1c-d) display the mirror image to the left of the stem. This description was the motivation for Baker's (1985: 375) mirror principle which posits that *morphological derivations must directly reflect syntactic derivations* (and vice versa). The patterns schematized in (2) are well-studied cross-linguistically, and there is to the best of my knowledge no counterevidence to this rigid ordering. Indeed, even though human languages exhibit wild variations with regard to the morphological properties of TMA expressions, there appears to be a strong constraint on the order in which learners can arrange these elements. Two additional findings make this immutable ordering fascinating.

One important finding is provided by Hengeveld (2011), who demonstrates that the development (or say grammaticalization) of ASPECT and TENSE (as well as other TMA expressions) can be accounted for straightforwardly in FDG in terms of "scope increase along hierarchically organized layers of semantic organisation". From the cartographic point of view, this would mean that grammaticalization of TMA expressions is a bottom-up process that targets contiguous positions up the clausal spine (cf. Cinque 1999; Ramchand & Svenonius 2014). A strong prediction that the two seemingly competing approaches make is that acquisition of TMA expressions will proceed in a fashion that reflects both Cinque's (1999: 106) tree and the rigid semantic layers in FDG. Two substantial studies merit mention. Boland (2006) investigated the acquisition of TMA from a typological and FDG perspective.

[2] 1. qualitative aspect/agentive modality; 2. tense/realis-irrealis/quantitative aspect/negation; 3. evidentiality; 4. illocution; 5. mitigation-reinforcement,

De Lisser (2015) conducted an acquisition study within the cartographic approach. Both studies conclude that children acquire TMA expressions following the rigid semantic hierarchy explained in terms of cartographic trees or FDG layers. In light of these findings, Wexler's (1998: 43) claim that children "are little inflection machines" would make perfect sense if the MTMA semantic hierarchy were given, and all learners needed to do was to detect the relevant cues for form-meaning mapping.

This conclusion leads me to a second important observation. Acquisition of TMA expressions, even in a multilingual context, appears to obey the MTMA hierarchy (cf. example 1d). Muysken (1981) was among the first to note that TMA sequences in creole languages follow (2) (modulo word order), and that their distribution correlates with the ordering of sentence adverbs. This observation, i.e., the intricate relation between TMA expressions and sentence adverbs, was later substantiated by Cinque (1999). Since most creoles emerged in a learning context that Bickerton (1981), and related work, considered to be chaotic, because it involved contact between genetically and typologically different languages in an inhumane situation of colonialism and slavery, one could imagine that learners would produce innovations, diverging from the common MTMA. Yet, this is not what we see: Creoles simply 'recreated' versions of the ordering in (2). For a time, some creolists, apparently unaware of Muysken's (1981) observations and the typological literature, treated creole TMA ordering as a prototypical 'creole-feature' (cf. Bakker et al. 2011). Much to their dismay, however, creoles, like any other human language, must obey the same rigid MTMA hierarchy.

This suggests to me that MTMA ordering is highly restricted and that linguistic variation in this domain is limited to superficial morphological distinctions that may serve as 'cues' to language learners. If the MTMA domain (commonly referred to as INFL in generative works) is immune to change, we may now ask ourselves where genuine typological structural variations come from: What is the source of cross-linguistic structural variation? In answering this question, Aboh (2020) concludes that it must be the result of changes within the clausal left peripheries, responsible for encoding information structure within the cartographic framework (cf. Rizzi 1997). Accordingly:

> Structural typological variation resides primarily in how languages encode information structure and the impact of this on their grammar.

In my Vidi-project, The typology of focus and topic: A new approach to the discourse-syntax interface (2003-2008), I closely collaborated with Kees with regard to the establishment of a database and with regard to the co-supervision of two PhD candidates, Niels Smit and Marina Dyakonova. The project led to

numerous publications which, in addition to describing and analysing cross-linguistic variations, brought to light a few linguistic invariables as well. With regard to cross-linguistic variation, it does not take the student linguist long to realize that the most striking difference between Slavic, Germanic, Romance, Kwa, and Sinitic is not so much their morphology, however flowery it may be, but rather how they encode information structure. Slavic affords numerous word order variations, Germanic mainly resorts to V2, Romance uses both the left periphery and the post-verbal position, while Kwa and Sinitic resort to a robust class of discourse markers that hover in clause-initial and/or clause-final positions. These broad typological characterizations make stronger predictions about linguistic structural types than mere morphological distinctions in MTMA sequencing.

Yet, there are some invariable aspects of the clausal peripheries which require further discussion, and about which I hope to entertain some insightful discussions with Kees in the future. Take, for instance, question formation. Given what we know about human linguistic creativity, and the range of imaginable possibilities within a clause, one wonders why human languages display such limited options in question formation, all contained within the left or right peripheries. Even though one can venture various cognitive or communicative explanations, the questions we asked about the rigidity of MTMA also arise here: How to explain such a limitation from a mind otherwise known for its wild creative multimodal linguistic innovations?

4 Conclusion

In this squib, I have shown that there are domains of grammar on which FDG and Cartography converge, leading me to conjecture that MTMA sequencing is innate. This would mean that the learner's task is to detect the relevant cues for form-meaning mapping. I further suggest that languages mainly vary within the clausal peripheries responsible for information structure, even though there are apparently some invariables there as well about which, I'm sure, Kees has more to say.

Uncommon abbreviations

EVID	evidential
HAB	habitual
INCH	inchoative
REM.PST	remote past

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