A cartographic sketch of the verbal domain in Sumerian

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Abbreviations

(Based on the Leipzig Glossing Rules http://www.eva.mpg.de/lingua/resources/glossing-rules.php).

~ reduplication
~PL = reduplication expressing verbal plurality
~PF = reduplication expressing present-future tense
1 = first person
2 = second person
3 = third person
A = agent (external argument of a transitive verb)
ABL = ablative case-marker or prefix
ABS = absolutive case-marker
ACC = accusative
ADV = adverbiative
ANT = prefix of anteriority
APPL = applicative
CLI = clitic
COM = comitative case-marker or prefix
COMPL = completive
COOR = coordinator prefix
COP = copula
CVN = compound verb nominal element
DAT = dative case-marker or prefix
DEM = demonstrative pronoun
DET = determiner
DN = divine name
ERG = ergative case-marker
FEM = feminine
FIN = finite-marker prefix
GEN = genitive case-marker
GN = geographical name
H = human
INCOM = incompletive
IMP = imperative
IND = indicative
INDF = indefinite
INF = infinitive
INS = instrumental
INTR = intransitive
IPFV = imperfective
IRR= irrealis
LOC = locative
L1 = locative1 case-marker or prefix
L2 = locative2 case-marker or prefix
L3 = locative3 case-marker or prefix
L4 = the archaic locative enclitic =/ne/
MASC = masculine
MID = middle prefix
MOD = modal prefix
NEG = negative particle
NH = non-human
NOM = nominative
ORD = suffix that forms ordinal numbers
P = patient (internal argument of a transitive verb)
PASS = passive
PF = present-future, or the marker of the present-future
PFV = perfective
PL = plural
PL = plural
PN = personal name
POSS = possessive
POSS = possessive enclitic
PR = pronoun
PRED = predicative
PRF = perfect
PROG = progressive
PROH = prohibitive
PRON = pronoun
PROX = proximal/proximate
PRS = present
PST = past
PT = preterite, or the marker of the preterite
PTCP = participle
PURP= purposive
Q = question particle/marker
RDP = reduplication
S = subject (single argument of an intransitive verb)
SBJ = subject
SBJV = subjunctive
SG = singular
STM = standard marker
SUB = subordinator suffix
SYN = syncopated form of a verbal prefix
TERM = terminative case-marker or prefix
TL = tenseless
TN = temple name
TR = transitive
VEN = ventive (venitive) prefix
VocP = Vocalic prefix

dub-sar	eme-gir$_{15}$	nu- mu-	un-	zu- a	a- na – am$_3$	nam-dub-sar – ra-ni
A scribe	Sumerian	who does not know			what is	his/her essence of scribe

A scribe that does not know Sumerian, what kind of scribe is he?

Abstract

Despite the numerous studies on Sumerian inscriptions and literature, there has been only very few attempts to examine the syntax of Old Sumerian from a generative grammar point of view.

The Sumerian language was spoken for at least a thousand years as a vernacular, and it continued to be used for two more millennia as the language of art, religious cult, royal dedications and legal proceedings. Any language is bound to change drastically over such a long span. To remain consistent and to avoid dealing with too much diachronic change, I look only at a limited period of Sumerian, between the fifth dynasty of Lagash and the third dynasty of Ur, roughly between 2400 BCE and 1900 BCE (Before the Common Era). In this respect, I follow the work of two of the most important contemporary scholars of the Sumerian language, A. Jagersma (2010) and G. Zólyomi (2017).

In this work, I make a tentative sketch of the Sumerian syntax with a cartographic eye. I do not try to encompass all the possible syntactic structures in the existing Sumerian corpus, but I concentrate on the most striking part of this language, its verbal domain. Obviously, to understand the verbal phrase (VP), one must look at other parts of the clause as well, but I do so only in as much at it is indispensable for the understanding of the VP.

The three main questions I try to address are:

1. Which are the syntactic positions of the constituent DPs – subject and object – in the Sumerian clause? Are these positions inside or outside the verbal domain?
2. How can we explain the particular arrangement of affixes in the verbal domain? In other words, which are the grammatical roles of the affixed morphemes?
3. How can we explain the aspect controlled split ergativity observed in the Sumerian corpus?

I organised the work in 5 sections:

Section 1 is a short summary of the history of the Sumerian language, or, more precisely, of what we know about it. It also has a succinct account of the cuneiform script, the oldest writing system that we know of.

Section 2 is a very short description of the Sumerian grammar. This section is by far not sufficient to really understand the Sumerian language organisation, but it gives a few summary points that are indispensable for the discussion that will follow. I include this section because Sumerian is rarely studied in linguist programs in universities and therefore it may be completely unknown to the reader. But keep in mind that this section is mainly a way to point to the excellent grammars published by Jagersma (2010), Foxvog (2016), Zólyomi (2017) and others.

Section 3 is an attempt to list some of the basic tools of generative grammar that I use in my reasoning. While most generative linguists are not aware of the particularities of Sumerian and may appreciate Section 2, most Sumerologists are not aware of generative linguistic basic concepts, and Section 3 is a way to point to these tools and provide some references.

Section 4 is a consideration of how the word order – in particular the head-final characteristics of Sumerian – and the directionality of the syntactic process are fundamental when trying to understand its cartographic structure. In this section, I provide a justification of the template structure I will use to explain my answers to the three questions mentioned above.

Finally, in Section 5 I propose answers to these three questions, based mostly on previous works but also adding an original proposal to explain the positional alternation seen in the split ergativity mechanism of Sumerian.

1 Introduction to Sumerian

1.1 Mesopotamia

Some ten to twelve thousand years ago, nomadic populations in the Fertile Crescent[1] became sedentary, as a consequence of the development of agriculture. Consistent production of food enabled a dramatic population increase and the appearance of stratified societies. In the old nomadic life style, every member of the group had very similar responsibilities and developed similar skills. In the sedentary societies, only a fraction of the group was sufficient to produce enough food for all its members, leaving many of them free to devote their energy to some other activity, for example art, commerce or military force.

One of the consequences of this life style transformation – many leading to progress of the human societies, but also many that are perceived today as negative outcomes – was the emergence of a new form of human collective organisation: city-states and the set of activities and institutions we call civilisation.

The space between the rivers Tigris and Euphrates – Mesopotamia[2] – is part of the Fertile Crescent. Several cultures flourished in that space during many thousands of years after the advent of agriculture. Archaeologists and historians suggest that a group of people speaking Sumerian[3] established itself in the area at some point between the Sixth and the Fourth Millennium BCE (Crawford, 2013).

As agricultural production in the region increased, technology and commerce flourished in a virtuous circle of improvement, and it became necessary to develop a method to keep track of the goods produced, payments made and debts incurred. A primitive system to engrave information on some support materials was developed between the Eight and Fourth Millennium BCE, around the Sumerian city of Uruk (Crawford, 2013, p. 99). This system evolved into the first proper writing system in the Late Uruk or Uruk III period, 3500-3100 BCE (Woods, 2010).

[1] The Fertile Crescent, often referred to as “the cradle of civilization,” is the crescent-shaped region in Western Asia and North Africa that spans the modern-day countries of Iraq, Turkey, Syria, Lebanon, Israel, Palestine and, for some scholars, Egypt.

[2] Ancient Greek μέσος (mésos, “between”) + ποτᾰμός (potamós, “river”) + -ιος (-ios, derivational suffix).

[3] Most likely an ancestor of Sumerian, given the long time between the Sixth Millennium and the period of "classical" Sumerian, i.e., the Third Millennium.

1.2 A perspective of the Sumerian language

Nothing is known with certainty about the origin of the Sumerian language (Graham Cunningham in Crawford, 2013, p. 95-110). Based on the written traces it is logical to infer that Sumerian was a vernacular language at some point in time. But there are no ways to demonstrate this inference (Michalowski, 2006). The mystery about Sumerians and their language was the subject of much controversy and discussions during the past century, under the name of "the Sumerian problem" (Rubio, 1999).

Høyrup (1992) proposed that Sumerian was a creole language or a fresh successor of a creole language, because of some characteristics shared between Sumerian and modern creoles. This thesis implies that there was one or perhaps more substrate languages, on one hand, and a superstrate language on the other hand, with the superstrate population dominating politically and economically the substrates. Thus, the superstrate was either an invading or migrating group of people that imposed themselves onto the existing local populations or, alternatively, an early dominant population supported economically by several migrating substrate populations, in a way similar to the "plantation model" of the North American Southern Confederation states or the many other creoles from Hawaii, Jamaica, etc. But, although it is logically possible that some languages arise indeed from creole predecessors, the data about Sumerian history in the early period is definitely not sufficient to enable a confirmation of Høyrup 's theory.

Another pathway for language evolution is dialectal drift, similar to what happened with Latin and its "daughters", the modern Romance languages. Yet another strong source of language evolution is language contact. Dialectal drifts may be accelerated by contact with neighbouring or substrate languages. Language contact alone, however, does not necessarily lead to a new, different language. The original languages of the area must have had dialectal drift, like any other language, and surely there was contact with other languages in the millennia that led to the making of civilisation. Unfortunately, there are only archaeological traces about the prehistoric period, and – in the absence of a writing system – they do not tell us which languages were spoken by the people that left them.

In summary, besides speculation and controversy, we don't know anything about the origins of the Sumerian language.

What we do know (Michalowski, 2000) is that Mesopotamia was bilingual Sumerian and Akkadian during most of the Third Millennium. Sumerian lords reigned in the southern cities while Akkadian rulers dominated the northern cities. Around 2324 BCE, a war lord named Sargon, from Akkad or Akkade, a northern city, managed to unite all of north, central and southern Mesopotamia under his rule, starting the Sargonian dynasty. The Akkadian language took over everyday life in a rather smooth process, since it is believed that the populations were already bilingual both in the north and in the south well before Sargon. Sargon was proud of his knowledge of Sumerian and his mastery of the cuneiform writing, and under his rule Sumerian was kept as a formal language for prestige communication in the court, for religious matters and for legal and administrative tasks (Michalowski in Hasselbach-Andee, 2020).

The Sargonian dynasty collapsed after two centuries. A Sumerian lord called Ur-Nama reunited the southern cities and the so called Third Dynasty of Ur governed between 2110 and 2003 BCE, bringing a brief resurgence of the Sumerian language. But Akkadian continued to be used by the people in everyday life and the process started with Sargon kept going. Writing standards continued evolving, strongly influenced by Akkadian. More and more texts in

Akkadian were produced and this last language became more and more important in the education system.

The last archived official document in Sumerian language dates from 1873-1865 BCE[4] (Michalowski, 2020). By the end of the nineteenth century BCE, Sumerian was spoken only in a few places, like the city of Nippur. It is considered that Sumerian became extinct as a vernacular language at this point. However, in a manner similar to that of Latin in Europe, Sumerian was the language of education and of official administration for a long time after it ceased to be vernacular. Legal documents incorporated Sumerian expressions interspersed in Akkadian text. Like Latin in the twentieth century[5] (and even today) in Europe and the Americas, legal and religious expressions[6] in Sumerian were written and read aloud by Akkadian speakers, perhaps often without the readers knowing the meaning of what they were reading.

This situation lasted for nearly two millennia, until the complete discontinuation of cuneiform writing in the last century BCE.

It is important to note that Sumerian and Akkadian are not related languages. There are no known relatives of Sumerian, while Akkadian belongs to the Semitic family, and therefore has characteristics very similar to those of modern Arabic and Hebrew. Akkadian is also the immediate ancestor of Babylonian and Assyrian, two dialects derived from the language of Sargon. At the beginning of the First Millennium BCE, Akkadian was replaced as the *lingua franca* of Mesopotamia by another Semitic language, Aramaic, which is still spoken these days.

Many other languages have been in contact with Sumerian throughout the Mesopotamian history. Among the oldest ones are Hurrian, Hattic, Eblaite, Elamite, Ugaritic, Amorite and Hittite (this last is possibly the oldest documented Indo-European language, thanks to the Hittite use of the cuneiform writing system).

During the First Millennium BCE, with the advent of the Persian, Medic and Parthian empires, languages of the Indo-Iranian branch of the Indo-European family were spoken in Mesopotamia, in addition to other local vernaculars and to the Semitic Aramaic. All these languages used the cuneiform writing system at some point in their histories.

1.3 The writing system

Hundreds of thousands of clay tablets from Mesopotamia have been unearthed in the last three centuries. Contrary to other substrates, like papyrus, leather or even wood, mineral substrates like clay or stone are very resistant and able to survive the passage of time. Although the decipherment of these tablets has been slow and difficult, we can count today on a written record of the Sumerian language that spans three millennia. Therefore, Sumerian is the oldest language of which we have a documented trace[7].

[4] The current chronologies of the history of the Near East do not allow precise dating for these ancient periods.

[5] Essential parts of the Catholic Mass were mandatorily said in Latin until 1965, in all countries.

[6] Like today's *habeas corpus*, *in fine*, *a posteriori*, *sine die*, *ab initio*, *ceteris paribus*, *ipso facto* and so on.

[7] Another writing system appeared in Egypt a couple of centuries after the cuneiform. It was written on stone in monument engravings and on a more fragile portable substrate, papyrus. Thanks to the dry climate of Egypt, some old documents on papyrus of that period have managed to survive, but not as numerous as the Mesopotamian clay tablets.

Sumerian cuneiform evolved from a fully iconic or pictographic system (signs are simplified drawings of what they represent) into a logographic system (a sign without iconic value represents a whole word), and soon after into a logo-syllabic one (most signs represent just syllables, but some signs still represent entire words). There are about 500 different signs in the Sumerian/Akkadian cuneiform (Mittermayer, 2006).

Woods (2010, pp. 33 - 84) gives a detailed account of the evolution of cuneiform writing in Sumerian. In the beginning, perhaps as early as 8500 BCE, Mesopotamians used tokens to symbolize the quantities of goods for trade and administration. Already then, the tokens were made of clay, which appears to be the most accommodating and durable support for documentation available at that time. These simple tokens evolved into complex ones, on which the type and the quantity of goods was represented graphically with pictograms and some symbols. Several goods, each in its respective quantity, could be mentioned in one complex token. Another important type of token was the clay envelope: several different tokens would be encased inside a hollow ball or similar receptacle made of clay, so as to guarantee no tinkering with the objects and quantities represented. With this system, parcels could be sent with a "delivery slip"; a debt or a will could be held from one year to another, perhaps even across many years, without risk of modification, whether intentional or unintentional.

Number symbols drawn on clay are evidently very useful to keep inventories and for the administration of large farms and government. Numerical clay tablets became the norm of administration. Account keeping with only numbers is difficult, though, and therefore the use of logographic symbols happened naturally (see Figure 1).

In the beginning, the logographic symbols were as iconic as possible. "Fish" was represented by a schematic drawing of a fish, "barley" was represented by a drawing of a grain spike, "head" was a drawing of a human head. But not all the images of goods were easy to draw. A drawing of a sheep might be too long or laborious to make, or it could be repeated so frequently that it was not necessary to reproduce its image faithfully. A simple circle containing a cross became understood by everyone as a symbol for "sheep".

As centuries passed, all the drawings, whether iconic or not, became standardized and streamlined with use. This process took away the iconicity of most signs. In the classical period and later, when cuneiform signs were used to write Akkadian and other languages, only very few symbols retained their original iconicity. The sign for "woman" still recalled, somehow, the female genital area, and the sign for "man" could recall (with some hinting) a male sexual attribute. A sign like a modern asterisk represents quite tellingly a star, and by semantic extension, the sky, heaven and the gods. At the end of the cuneiform evolutionary process, most of the other signs, including the once very graphical "goat" and "bull", do not evoke the image of the goods anymore. The "natural" signifier turned into a Saussurean arbitrary one in the writing system too (see Figure 2).

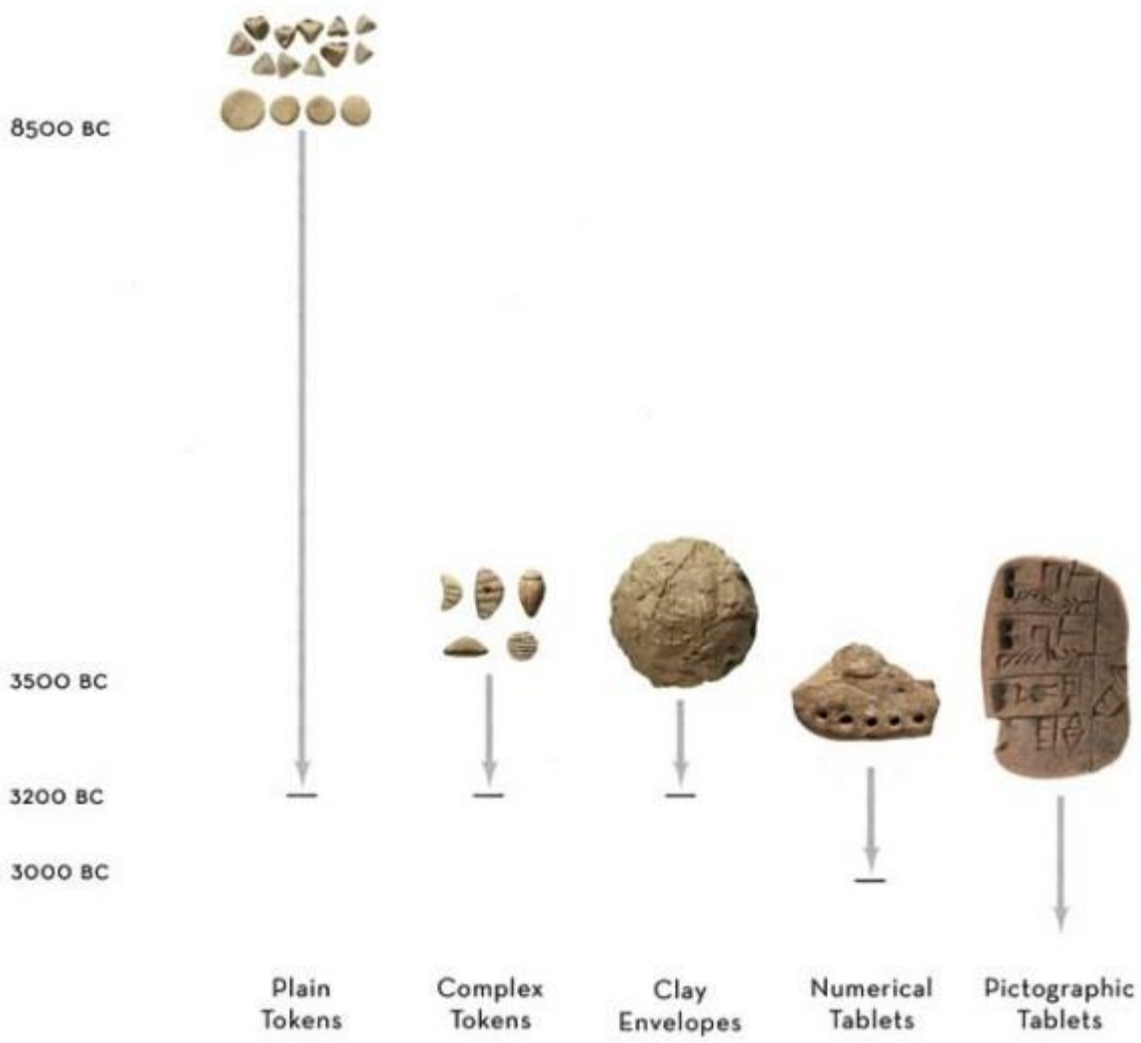


Figure 1. From tokens to tablets (Woods, 2010, p.47).

When pictograms of the preliterary period were transformed into writing signs, they were often rotated 90°, mostly – not exclusively – counterclockwise. The first sign in Figure 2 shows a man's head in a supine position, while the proto-signs in the pictographic tablets showed it in a standing position. Many of the pictograms went through this rotation, perhaps due to the convenience of representing series of signs that make nominal groups or predicates inside frames or boxes. On the early pictographic tablets, these boxes stand vertically, but later they appear laid down on their long side, in a horizontal arrangement. Rotating the boxes rotated the individual signs that were inside them.

There was also evolution on the phonological dimension. Logograms representing a word started to be used to represent only the initial syllable of the word (using the rebus principle). The logograms (a sound associated to a meaning) were replaced by phonograms (a sound

Figure 2. Loss of iconicity (Woods, 2010, p 38).

without a defined meaning) and iconicity lost its sense: the representation of some good was made through the representation of the sounds (phonograms) that compose its spoken name, not by a symbol recalling its physical shape. Phonograms are more efficient than logograms, because a logographic system requires a much higher number of signs than a phonographic system to be useful as a representation of speech.

Woods (2010) notes that the need to write Akkadian using the Sumerian signs precipitated the transformation into a phonographic system. The fact that the Sumerian words are often monosyllabic helped the identification of logograms with phonograms corresponding to the syllable. And the practical value of the phonograms was increased by the association of one sign with multiple sounds or syllables, which the reader could select depending on the context of the phrase or with the help of subsidiary signs.

The scribe education started at a young age and was a valued asset for those that could afford it, including for the aristocracy. Long hours of exercise were required to memorize the meaning of the signs and to acquire the mastery of their drawing. When the student's mother tongue was Akkadian, they had to learn Sumerian as well. This is very fortunate for us, since bilingual texts and grammar exercises written on clay for the benefit of these Akkadian-

speaking students enabled archaeologists and philologues to decipher and understand Sumerian, four thousand years after it had become a dead language.

1.4 Diachronic changes and corpus limitations

Since the written sources of Sumerian encompass a period of some two to three thousand years, it is very important to recognise the changes that happen inevitably in such a long interval (Black and Zólyomi, 1999). The early attempts to write Sumerian grammars were hampered by the fact that diachronic variation was not fully recognised. The latest grammars (Jagersma, 2010 and Zólyomi, 2017) are aware of diachronic changes and also of dialectal differences, and that awareness enables them to analyse the language as much as possible without the confounding factor of language variation. It is not always possible to establish correctly the date of a document, though, and some doubts still persist about the meaning of some morphemes and the significance of some grammatical traits.

Despite the evident difficulty to study phonological change in an extinct language, Sumerologists and Assyriologists have nonetheless succeeded retracing at least part of the phonological evolution of Sumerian. As before, doubts and uncertainties still persist, but our level of knowledge is already acceptably appropriate to conduct linguistic analysis.

Black and Zólyomi (1999) mention also another confounding factor: orthography change. Some words (or sound series) were written differently at different times or in different areas; this does not entail language variation but it could easily be confused with it.

As mentioned before, an amazing number of *original* cuneiform documents is available for study. However, philologists and historians estimate that this large number of documents represents only a few percentages of the total production. The other part, the large majority, are inaccessible to us, most of them destroyed and lost forever. Under these circumstances, we cannot aspire to be able to describe and analyse Sumerian but in a partial way.

Another important factor to consider is that the vast majority of Sumerians was illiterate. We can only know the artificial – probably somehow "unnatural" – language of the scribes. And we have already discussed the fact that many scribes after the end of the Third Millennium were not native speakers of Sumerian. Consequently, syntactic structures of the "real" language can only be inferred and approximated from the analysis of the available texts.

For all these reasons, Jagersma and Zólyomi (and anyone who attempts to look at Sumerian for linguistic analysis today) base their grammars on documents that can be attributed to the second half of the Third Millennium and the early Second Millennium BCE, the "paleo-Sumerian" and "neo-Sumerian" periods, in an approach parallel to the preferential study of the classical periods of other ancient languages.

Since Jagerma's and Zólyomi's grammars are two of the most recent, this document uses them as the starting basis for cartographic analysis. Therefore, this work is restricted to the period and sources used by these two authors.

2 Short description of the Sumerian grammar

As stated before, Sumerian is an isolate language. It does not show any clear parallels to any other known language; however, since it is a human language, there are basic traits that correspond to a fundamental "Universal Grammar". UG is still a controversial matter, though, and it is not clear whether it is a specific “genetic endowment", as proposed by traditional generativists (the Chomskian line), or if it is rather an evolutionary capability, supported by the general cognitive system of the human species.

Diakonoff (1983) formulated the idea that very old languages such as Sumerian are, for lack of a better term, “archaic”. In his words, *“on the lexical level* these *languages have no or poorly developed means of expressing abstract ideas”*. He adds that *"Sumerian is an archaic language in which abstract ideas were in the making: this is why both Sumerian language and Sumerian mythology are so interesting. It has no means to express a subject-object relation, and very inadequate means to express the idea of time, etc."* Diakonoff’s ideas are important to understand the main characteristics of the Sumerian language, as it will be seen in the following sections.

In this approach to Sumerian, I consider that at least some of the fundamental tenets of Minimalism apply to it. Since a great part of the generativist work has been done on Indo-European languages – especially English, Romance and Germanic –, the analysis of Sumerian requires an effort to expand the theoretical basis and look at some principles that are not explicit or customary in the Minimalist doctrine, in particular regarding the head-final characteristic (more on this in Sections 3 and 4).

2.1 Typological considerations

2.1.1 Agglutinativity

Sumerian is an agglutinative language. Morphemes are added to phrase heads in a fixed sequence. The word root is preserved without modification and grammatical changes are expressed by the addition of affixes. The affixes are exclusively suffixes for the noun phrase and mostly prefixes (up to eleven types) for the verb phrase, with a few possible suffixes (up to three types). In the case of compound verbs, quite frequent in Sumerian, the prefixes might be considered infixes, although this would require a detailed discussion that is not indispensable for this work.

2.1.2 Ergativity

Another salient characteristic is ergativity, or for a more accurate description, split ergativity. Nominal phrases are consistently fully ergative, i.e., agentive nouns in a phrase bear the ergative case marker. But verbal phrases are split-ergative.

In phrases with perfective aspect, the transitive verb shows an ergative-absolutive alignment: the external, agentive argument is given the ergative case, while the direct internal argument is in the absolutive, non-marked case. Intransitive verbs assign a non-marked case (usually assumed to be the absolutive) to the argument in the subject position. But, as typical in split-ergative languages, this alignment becomes a form of nominative-accusative in other environments, specifically in the imperfective aspect. In an imperfective situation, independently of transitivity or intransitivity, the Subject – whether agentive or not – is in a non-marked case that can be supposed to be a nominative, while the Object – of transitive verbs – is in an also non-marked case that could be accusative or absolutive. It is important to note that other split-ergative languages have different criteria for the split. The Sumerian

criterion is Aspect, while other languages rely on person (for example, only the Subject in the third person may be marked as ergative) or some other feature (for example, whether the Subject DP is a pronoun or not).

I will discuss the Sumerian split ergativity mechanisms in section 3.3.

2.1.3 Word order

The word order in Sumerian is clearly Subject-Object-Verb (SOV). Sumerologists and Assyriologists simply acknowledge this order without discussion. But a linguist attempting an analysis based on generative principles must consider whether this apparent word order comes out of the primary structure or whether it is the result of some rearrangement that arises at the interface between syntax and phonology.

The main reason for this questioning comes from the tension between theories asserting that the universal basic order is SVO – and then the apparent different orders are the result of rearrangements or syntactic movement (Linear Correspondence Axiom (LCA), Kayne 1994, 2003, 2011, 2015) – and theories that support word order as a result of a parametric choice between head-final and head-initial structures (Haider 1997, 2000, 2013, 2018).

Strict adherence to the LCA can favour an explanation that says that the Sumerian disposition of morphemes in the verbal group is compatible with a VO order. To support this view, it becomes indispensable to invoke a rather complex set of phonological requirements and syntactic movements, a step taken by Niedzielski (2017).

But the LCA approach is subject to serious challenges in terms of principled motivation (lack of a principle-based explanation for the motivation and triggering of post syntactic movement) as well as by the idea that language processing is performed by the human brain in the most economical way (Okham's razor when confronting alternative explanations).

I discuss the question of word order in some more detail in Section 4.

2.1.4 Lexical categories

Many scholars have contributed to the current understanding of Sumerian through numerous grammar treaties written since the beginning of the 20th century. The most cited authors that have dealt with Sumerian grammar are: Stephen Langdon, Thorkild Jacobsen, Joachim Krecher, Marie-Louise Thomsen, Pascal Attinger, Dietz Otto Edzard, Daniel Foxvog, John Hayes, Miguel Civil, Gonzalo Rubio, Piotr Michalowski, Christopher Woods, Bram Jagersma, Jeremy Black, and Gabor Zólyomi (see Marsal (2014 and 2015) for a history of the decipherment of Sumerian).

Summarizing the previous knowledge, Black (2002) proposes that Sumerian has eight distinct lexical categories. The first seven are identical to those we are used to in the European languages. The last one is specific to Sumerian and refers to semantically empty words whose only function is to enhance the aesthetics of the phrase, like the "mimetics" of Japanese:

major classes:	1. Nouns	minor classes:	3. Pronouns
	2. Verbs		4. Adjectives
			5. Conjunctions
			6. Interjections
			7. Adverbs
			8. Ideophones

Jagersma (2010) proposes a somewhat different list:

1. Nouns
2. Verbs
3. Adjectives
4. Pronouns
5. The plural marker {enē}
6. Case markers
7. Numerals
8. Ideophones
9. Conjunctions
10. Interjection

The most important distinction between Black and Jagersma is about the existence of adverbs. For this last author, what others call adverbs are particular constructions involving nouns or adjectives (Jagersma 2010, p. 81), for example using the expression "that day" as a time adverb for the past.

2.1.5 Pronouns

Personal pronouns and possessive suffixes are encountered often in Sumerian examples (UPPER CASE for sign names, lower case for phonological morphemes[8]):

Table 1. Personal pronouns

	Singular	Plural
1st person	ĜA$_2$, ĝe$_{26}$-e / ĝa$_2$-a	(me-en-de$_3$-en)
2nd person	ZA, ze$_2$, ze$_4$-e / za-a	(me-en-ze$_2$-en)
3rd person	a-ne, e-ne	a-ne-ne, e-ne-ne

Table 2. Possessive suffixes

	Singular	Plural
1st person	-GU$_{10}$	-me
2nd person	-zu	-zu(-e)-ne-ne, -zu-ne
3rd person – Human	-a-ni	-a-ne-ne
3rd person – Non-Human	-bi	(bi)

[8] The subscripts – like 26 in the 1st person pronoun **ĝe$_{26}$** "I"– differentiate between supposed or possible different phonological realizations of the morpheme, for example **ĝe$_6$** "night".

2.2 The noun phrase

In the following descriptions, I adopt Jagersma's and Zólyomi's way to present Sumerian language phrases for their analysis (see Jagersma 2010, p. 12 and Zólyomi 2017, p. 21).

Each phrase has four lines:

1. standard graphemic transliteration (sign-by-sign attribution of phonographic value);
2. segmentation into morphemes (an interpretation of the sequence of graphemes);
3. morpheme-by-morpheme glossing[9];
4. translation into English

2.2.1 Nominal (noun) case markers

Sumerian does not have articles, and it does not have prepositions nor postpositions. In the absence of these functional categories, explicit case markers identify the thematic roles in a sentence.

Table 3. Noun case markers

	Singular	Plural
Ergative	e	ʔ,e,n,b,
Absolutive	Ø	Ø, en, en-de$_3$-en, etc.
Genitive	ak	
Dative	ra	a (n+a or n+i)
Directive (adessive)	e	i (b+a or b+i)
Locative	a	ni or e
Terminative	še$_3$	ši or še$_3$
Adverbiative	eš$_2$	
Ablative	ta	ta
Comitative	da	da
Equative	gen$_7$	

The nominal phrase (NP) follows a rigid template for the placement of P1) lexical heads, P2) adjectives or modifiers, P3) possessive indicators, P4) number indicators and P5) case markers, in that order. For easier reading and understanding, the positions P1, P2, etc. are indicated in the glosses as leading subscripts.

As an illustration, here is a simple noun phrase cited by Zólyomi (2017, p. 37):

1) dumu an-na-ra

$_{P1}$dumu $_{P3}$[$_{P1}$an=$_{P5}$ak]=$_{P5}$ra
$_{P1}$child $_{P3}$[$_{P1}$DN=$_{P5}$GEN]=$_{P5}$DAT.H
"*for the child of (the god) An*"

[9] Based on the Leipzig Glossing Rules http://www.eva.mpg.de/lingua/resources/glossing-rules.php. See also the Abbreviations page at the beginning of this document.

2.2.2 Embedded noun structures

The case markers in complex noun structures are attached according to a hierarchical order, which results in embedded NPs:

2) sipad udu siki-ka-ke$_4$-ne (Zólyomi 2017, p. 38)

$_{P1}$sipad $_{P3}$[$_{P1}$udu $_{P3}$[$_{P1}$siki=$_{P5}$ak]=$_{P5}$ak]=$_{P4}$enē=$_{P5}$e
$_{P1}$shepherd $_{P3}$[$_{P1}$sheep $_{P3}$[$_{P1}$wool=$_{P5}$GEN]=$_{P5}$GEN]=$_{P4}$PL=$_{P5}$ERG
"the shepherds of sheep of wool (= wool-bearing sheep)"

2.3 The verbal domain

The Sumerian verbs come in two morphological types, expressed by a stem or verbal base that Akkadian grammarians called *ḫamtu* and *marû*[10]. Philologists have identified these two forms variously. Some say that *ḫamtu* is a past form, and *marû* a non-past, i.e., present or future.

From a linguistic point of view, these two forms correspond better to what we call aspectual forms. *Ḫamtu* is perfective and *marû* imperfective. I will use these denominations here.

In the clause, Sumerian verbal forms are either finite or non-finite.

2.3.1 Non-finite template

The non-finite verbal forms are three kinds of participles: perfective, imperfective and present. These forms are identified by two morphological parameters: the type of verbal base or stem (*ḫamtu* or *marû*) and the suffix.

Jagersma (2020, p. 312) identifies four combinations of these parameters:

- perfective base with no suffix (or the Ø suffix); a non-specific action or state, usually a present one (a kind of tenseless, aorist form of a present participle).
- perfective base with the -/ʔa/[11] suffix; a specific action or state, the perfective past participle.
- imperfective base with the -/ed/ suffix, the imperfective present or future participle.
- imperfective base with the -/ʔa/ suffix, the imperfective past participle, a rare form used with the so-called "pronominal conjugation" (Jagersma 2010, p. 671).

But Zólyomi (2017, p. 91) identifies only three participles:

- a tenseless form, perfective base with no suffixes (or the Ø suffix).
- a preterite form, perfective base with the -/ʔa/ suffix, also called "the nominalizer".
- a present-future form, imperfective base with the -/ed/ suffix.

The first non-finite form above – the perfective base with no suffixes – is particularly productive to express adjectival concepts in compound verbs, like **dub-sar** "scribe", where **dub** means "clay tablet" and **sar** is the non-finite stem "to write". The morphemic analysis is **dub=Ø-sar=Ø**, i.e. the noun stem and the verb stem, both with null suffixes.

[10] *Ḫamtu* is Akkadian for "quick", while *marû* can be translated as "slow" or "fat". Civil (2002) proposes that the original Sumerian names were *lugud$_2$* "short" and *gid$_2$* "long".
[11] The nominalizer suffix was probably preceded by a glottal stop **/ʔ/**. Zólyomi uses the form **ʾa**. For comfort of typing, sometimes it is represented only by the letter **a**.

These participles are thoroughly explained in the cited works; therefore, we won't go into further detail here.

2.3.2 Finite verbal template

Finite clauses accommodate the verb using an invariable template. The different positions in this template are referred to by their ordinal numbering. Since the order is invariable, this system greatly helps interpretation and translation. Properly speaking, the first 4 or 5 slots do not belong to the verbal domain, but rather to the clause domain. However, the Slot system does not make this difference and therefore understanding the verbal part implies also understanding the clausal part.

The "Electronic Text Corpus of Sumerian Royal Inscriptions"[12] (ETCSRI) contains detailed documentation about the templates, both nominal and clausal/verbal. Here is the description of the different positions in the clausal/verbal template, called "Slots" (Zólyomi, 2017):

Table 4. Slot organization of the Sumerian verbal template.

Slot 1	The modal prefix **ha**-, negative prefix **nu**-, prefix of anteriority
Slot 2	Modal prefixes other than **ha**-, the finite-marker prefixes
Slot 3	Coordinator prefix
Slot 4	Ventive (cislocative) prefix
Slot 5	Middle prefix or 3NH pronominal prefix (specifying the person, gender and number of the first in the sequence of dimensional prefixes)
Slot 6	Initial Pronominal prefix (specifying the person, gender and number of the first in the sequence of dimensional prefixes)
Slot 7	Dimensional I: dative prefix
Slot 8	Dimensional II: comitative prefix
Slot 9	Dimensional III: ablative or terminative prefix
Slot 10	Dimensional IV: locative1, locative2, or locative3 prefix
Slot 11	Final Pronominal prefix (referring to **A** or **P**, depending on the aspect/tense)
Slot 12	Stem
Slot 13	Present-future marker (in intransitive verbs)
Slot 14	Pronominal suffix (referring to **A**, **S**, or **P** depending on the tense)
Slot 15	Subordinator (also called "nominalizer")

A = Agent, **P** = Patient, **S** = Subject

This is the general template that applies to all constructions. Obviously, not all the clauses use all the slots, since each clause has individual needs for different grammatical elements.

In practice, the shortest finite verbal form uses three slots: S2 (finite marker), S12 (verb base or stem) and S14 (pronominal suffix, cross-referencing the Subject).

[12] https://oracc.museum.upenn.edu/etcsri/Parsing/index.html#VPT

The longest finite verb formulation found in the existing corpuses uses nine slots (Zólyomi 2017, p. 83):

3)


$^{a\text{-}šag_4}$ašag tum$_3$-de$_3$, am$_6$-ta-bala-e-da
ašag=ø tum-ed=e $_{S2}$a-$_{S4}$m-$_{S5}$b-$_{S9}$ta-$_{S10}$e-$_{S12}$bala-$_{S13}$ed-$_{S14}$ø-$_{S15}$'a
field=ABS *bring*-PF=DAT.NH FIN-VEN-3.SG.NH-ABL-L2-*cross*-PF-3.SG.S-SUB
"who crosses (the boundary levees) to take away fields"[13]

$^{a\text{-}šag_4}$ is a *determinative* (a grapheme or set of graphemes), an element that refers to the nature of the noun that follows or precedes in the written text. It is intended only to help the reader's interpretation of the text; it is not spoken and has no phonological impact (no vowel harmony, no contractions, etc.) and therefore does not require a gloss. It should not be confused with a determiner or a classifier.

2.3.3 Case agreement inside the VP

As it can be seen in the template (Table 4), Slots 7 to 10 – the "dimensional prefixes" – are occupied by morphemes that contain information related to case agreement with the object(s), and Slots 11 and 14 cross-reference the Agent, Subject or Patient. Also, Slot 13 contains a tense/aspect marker that depends on the verbal lexical specification and applies only to intransitive verbs.

All these slots are then related, one way or another, to the Case property. Few other languages, among those that have been studied, show this type of Case agreement inside the VP, and none in such an extensive way.

When looking at the general form of the Sumerian verb, one may deduct that all these morphemes are forms of verbal inflexion, similar to the inflexions we see in other languages, like the person, aspect and tense inflexions in Romance languages or the person, aspect, tense and gender inflexion in some Semitic languages.

But despite their placement inside the "verbal capsule", the so-called "dimensional" prefixes – which are related to the objects and their case – are probably not inflexions but clitics or perhaps a sort of pronouns. The difference between a clitic, an affix and an inflexion is not clear-cut, though, and especially not in an agglutinative environment.

What we can retain of the above is that Slots 5 to 10 cross-reference the participants of the predication. The name "adverbial case" has been used to refer to these prefixes. It is worth to note that these adverbial modifiers are organized as composites. The adverbial compound contains first a pronominal prefix and then the main adverbial prefix. The pronominal part specifies the person, number and gender of the second part, which contains only grammatical

[13] Or, to better reflect the case structure of the NP: "which overflows to carry away the sown fields".

case information. This way, the composite contains person, number, gender and case information. In this respect, the composite resembles the clitics in Romance languages, as in:

4) Paul donne la fleur à Marie. Il la lui donne. (French)
PN VERB.3SG.PRES DET NOUN PP PN PRON CLI1 CLI2 VERB-3SG.PRES
Paul gives the flower to Marie. He it to-her gives.
"Paul gives the flower to Marie. He gives it to her"

Where the clitics CLI1 and CLI2 refer to the direct and indirect object, respectively. Note that CLI1 is a composite of accusative case, gender and number, while CLI2 is a composite of dative case, person and number.

It is also interesting to observe that the clitic-bearing phrase has a different word order than the standard, complete phrase. Usually, French has a rigid SVO order, but the clitics are in the SOV order.

The change in word order is one of the reasons that lead linguists to define morphemes such as CLI1 and CLI2 as clitics. If they were not clitics, it should be possible to hear variants that place one or both of them after the verb.

In Sumerian, the order of all the Slots is fixed and invariable. But Slots 1 to 4 are clearly not clitics. Therefore, their preverbal placement most likely reflects the hierarchical order of Functional Heads above the VP. Following a similar logic, Slots 13 to 15 must reflect a hierarchical order too, but they are linearized after the verb stem. The challenge is to find the cartographic order of these Functional Heads in a way that is adequate to explain the prefix and suffix positions in the different constructions.

2.3.4 Verbal forms

Verb stems in Sumerian are of two types: *ḫamtu* and *marû,* as the Akkadian grammarians called them.

Jagersma (2010) assimilates *ḫamtu* to a perfective **aspect** form, and *marû* to the corresponding imperfective.

Zólyomi (2017) prefers the term PRETERIT (PT) for *ḫamtu* and PRESENT-FUTURE (PF) for *marû*. He proposes that these are **tense** forms.

There are parallels to this structure of the verbal form in other languages. For example, verbs in the Mayan language K'iche' (Larsen, 1988) have two aspectual morphologies: completive (COMPL) and incompletive (INCOM). As in Sumerian, K'iche' does not have specific morphology related to simple temporality/tense[14]. Other ancient and modern languages, like many variants of Chinese (Lin 2006, Arcodia 2023), do not seem to have a syntactic projection for Tense. Sumerian is not a special case in this respect, and therefore Jagersma's use of the function Aspect seems the most appropriate.

Despite the strong evidence in favour of the Aspect marker, there is still some confusion related to the Tense-Mood-Aspect "entanglement". For example, Rubio (2007), in his very

[14] Also as in Sumerian, the K'iche' verb domain contains cross-references to the Agent, Patient and Subject, in an ergative-absolutive alignment.

complete description of Sumerian Morphology, conflates imperfective aspect with future tense:

> *"With truly finite verbal forms (i.e., not followed by pronominal suffixes or the nominalizer), the suffix /-ed/ is infrequent:* e_2-mu lu_2 i_3-$buru_3$-de_3 *'some- one could break (/i-*$buru_3$*-[e]d-e/) into my house' (Code of Lipit-Estar, §11). The usages of /-ed/ and its specific co-occurrence with the* marû *stem clearly point to a marker of imperfective aspect and essentially future tense: it refers to an event that has not yet taken place, or that is beginning or about to begin (inchoative and ingressive aspects), as well as to the obligatoriness or impossibility of a future event."*

2.3.4.1 Verb classes

Based on the morphology of the *ḫamtu* and *marû* forms, there are four classes of verbs:

Table 5. Verb classes

Class	Stem in *Ḫamtu*	Stem in *Marû*
1 - Regular	Form A	Form A
2 - Reduplicating	Form B	Form BB
3 - Extended	Form C	Form C + suffix /ed/
4 - Suppletive	Form D	Form E

Class 1 verbs, the regular class, use the same stem form for both the perfective and the imperfective constructions. The difference is seen only in the placement of the prefix in Slot 11 (the Final Personal Prefix FPP) and the pronominal suffix in Slot 14.

Class 2 verbs use a reduplication of the perfective stem for the imperfective construction. The reduplication is affected by the phonotactics of each morpheme: if the stem ends with a consonant, the consonant can be omitted; if the stem is bisyllabic, only one of the syllables will be reduplicated; and so on.

Class 3 verbs act like class 1, except that they add the **-/ed/** suffix (called the "present-future marker") in Slot 13 for the imperfective.

Class 4 verbs use a suppletive stem for the imperfective, for example the verb "to go", **ĝen** for the perfective and **du** for the imperfective. The different morphemic roots of the suppletives are probably the result of syncretism between etymologically different verbs, like in other languages.

2.3.4.2 Verb plurality

Some verbs use a different form to describe predicative plurality. There are two types of verb plurality:

Event plurality, when the event described by the verb repeats itself. There are several circumstances in which the event can be considered "multiple": iterative, durative, intensive, distributive (several subjects or objects are involved simultaneously in the action).

Participant plurality, when the ergative subjects are more than one. Note that non ergative subjects may also need a "plural event" verb form; but in this case, the plurality belongs to the event, as in the preceding paragraph.

The plural morphology expresses itself with suppletives in most cases, although some of these plural forms also show a degree of reduplication with regard to their root.

2.3.5 Nominalization and relative clauses

As seen before, Sumerian has also a Non-Finite template (Section 2.3.1). For memory, there are four possibilities: each stem type, perfective and imperfective, has two non-finite forms, one with the suffix **-/ʔa/** and another without it.

In addition to its function as a marker of non-finite verbal forms, the suffix **-/ʔa/** is used to nominalize phrases, like in:

5) Fragment of *RIME*[15] *3/1.01.07, St C composite*, a text engraved on a statue of the king Gudea:

lu_2	e_2-ninnu	^{d}nin-ĝir$_2$-su-ka	in-du$_3$-a
lu_2	e_2-ninnu	nin.ĝir$_2$.su.k=ak=Ø	i-n-du$_3$-Ø-ʔa
man	temple-Ninnu	Ningirsu=GEN=GEN=ABS	$_{S2}$FIN-$_{S5}$3.SG.H-$_{S12}$build-$_{S14}$ABS.3.SG-$_{S15}$NOMZ

"*The builder of the Eninnu*[16] *of Ningirsu*"

However, the nominalized clause can also be interpreted as a relative clause:

"The man that built the Eninnu" or *"The man who built the Eninnu"*

The suffix **-/ʔa/**, the nominalizer, is then an equivalent of a relative pronoun and/or a complementizer.

2.3.6 Aspect and no tense

Like the reconstructed Proto-Indo-European (PIE) language (Kiparsky 1968), Old Egyptian (Werning 2008), Old English (Osawa, 1999; van Gelderen, 1993) and other ancient or modern languages – for example the already mentioned Mayan K'iche' (Larsen 1988) or Chinese (Lin 2006) –, Sumerian does not have a tense inflexion. All these languages express temporal properties through adverbial constructions and/or Aspect.

Akkadian, which shows several characteristics that are not typical of related Semitic languages, did not have Tense either, although it had a more complex Aspect category set than Sumerian (Huehnergard and Woods, in Woodard 2004, p. 253):

- durative, used for present or future situations,
- perfect, used to describe recent past situations which still influence the present (like the English present perfect "I have brought something for lunch") and
- preterite, used for punctual, completed actions in the past.

[15] RIME = *Royal Inscriptions of Mesopotamia - Early periods*, a collection of volumes – edited by the University of Toronto Press – that lists cuneiform inscriptions related to Mesopotamian kings.

[16] The E-ninnu (House-fifty) was a temple dedicated to the god Ningirsu ("Lord of Girsu") in the Sumerian city of Girsu.

Assyriologists think that Akkadian was heavily influenced by Sumerian in the Sumerian-Akkadian *Sprachbund* of the Third Millennium BCE. For example, contrary to the other known Semitic languages of the area, which have a VSO order, Akkadian has a SOV order; this specificity of Akkadian is attributed to the intense and long contact with Sumerian (Michalowski 2006, p. 164). Conversely, Akkadian must have had a very important influence on the Sumerian of the Paleo- and Neo-Sumerian periods, as we saw in the introduction.

Given the dichotomy *ḫamtu/marû* in the morphology of Sumerian verbs and the way it is implemented in the four classes, the logical conclusion is that the Tenses of Sumerian, if they existed, would have had to be a binary toggle Past/Non-Past, very closely associated with the concept of perfective (completive) and imperfective (incompletive). If we admit such close association, there is little room to differentiate Aspect from Tense in the syntax, and probably the Sumerian speakers would not have seen a difference.

As said before, many languages are known for not having a Tense function in their grammar. Sumerian could very well count among these tenseless languages. This is capital for the cartography of the VP; if there are no other Functional Heads between the VP and the CP (or the lowest Functional Head in Rizzi's (1997) "left periphery"), then the placement of the dimensional prefixes might be easier to explain.

2.3.7 Aspect-controlled prefix-suffix alternation

The Sumerian verb phrase shows different placement of the subject and object cross-referencing morphemes around the verb stem depending on its Aspect and whether the event is transitive or intransitive.

Slots 11 and 14 are the locus of these cross-referencing morphemes. As seen in Table 6, if the event is intransitive, the pronominal suffix is the same for both Aspects. But if the event is transitive, in the perfective the Subject is a prefix and the Object is a suffix, while in the imperfective the Object is a prefix and the Subject a suffix. This alternation is acknowledged by the grammars, but remains unexplained.

Table 6. Aspect-controlled prefix-suffix alternation in transitive verb phrases (based on Jagersma 2010, p. 327, and Rubio 2007).

Transitivity	**Aspect**	**Slot 11** **Final Pronominal Prefix (*case*)**	**Slot 12** **Verb stem**	**Slot 13** **Aspect suffix**	**Slot 14** **Pronominal suffix (*case*)**
Transitive	Perfective	Subject **A** (*ergative*)	*ḫamtu*	Ø	Object **P** (*absolutive*)
	Imperfective	Object **P** (*accusative*) *Or else:* Oblique **O** **-/b/**	*marû*	Ø	Subject **A** (*nominative*)
Intransitive	Perfective		*ḫamtu*	Ø	Subject **S** (*absolutive*)

	Imperfective		*marû*	Class 1,2 and 4: Ø Class 3: **-/ed/**	Subject **S** (*nominative*)

A = Agent (ergative) ; **S** = Subject (unergative) ; **P** = Patient (direct object) ; **O** = Oblique object.

The non-marked case in Slot 14 can be called either *absolutive* or *nominative*. Sumerologists usually prefer the term *absolutive* (e.g., Rubio 2007). If one chooses to call the subject's case *nominative*, then the object's case can be called *accusative*, to remain coherent with the traditional nomenclature.

Split ergativity will be discussed in detail in section 3.3 on p. 35.

3 Grammar Theory Toolbox

3.1 Syntax-building principles and basic assumptions

In order to propose a cartographic structure for the Sumerian verbal domain, I will use a few of the fundamental principles of the Minimalist methodology, together with some other theoretical assumptions that complement or complete the Minimalist approach.

3.1.1 Merge

The fundamental principle of generative grammar is the axiomatic definition of the initial step in the formation of a linguistic phrase: ***merge***.

Minimalist linguists assume that the build-up of a phrase starts "from the bottom" with the fusion or *merge* of two linguistic elements. It is widely accepted that this process is binary, i.e., no more than two elements are merged in one step. The result of a merge operation is a linked pair.

6) α *merge* $\beta \longrightarrow \{\alpha,\beta\}$

Subsequent merge operations can be applied to the result of the previous one (recursivity):

7) γ *merge* $\{\alpha,\beta\} \longrightarrow \{\gamma,\{\alpha,\beta\}\}$

Importantly, *merge* does not require a given order: $\{\alpha,\beta\}$ is equivalent to $\{\beta,\alpha\}$.

3.1.2 Heads, Specifiers and directionality

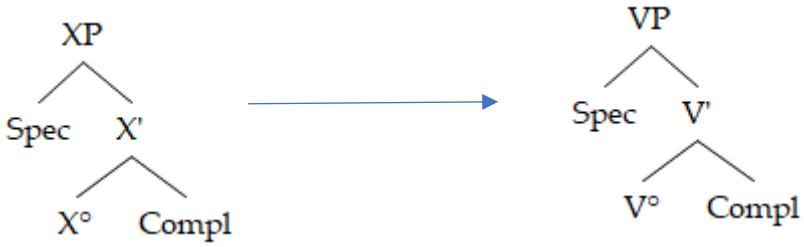
In order to explain more complex structures, one needs to consider the fact that some elements "license" or "select" others. For example, verbs select or "subcategorize" their complements and other elements structurally related to them (specifiers, which are discussed below). Because of this fact, grammars use the notion of "**head**".

Despite the licensing evidence, in the current state of knowledge about syntactic operations, it is still not clear whether the model requires the designation of a "head" to reflect the linguistic reality. For example, there seems to be instances in which two elements belonging to the same category, i.e., having the same type of properties, appear to *merge*, like in verb stacks or clusters, sometimes with no indication of which one is the licenser and which is the licensee.

There are many doubts about the theory of Functional Heads (for example, Haspelmath 2021). However, Lexical Heads, at least, seem to correspond to linguistic reality in some reasonable measure.

For the purpose of this work, distinguishing "heads" from their sister element in the merged structure is necessary. I accept the Head as the basic element (one of the two in the pair {α,β}) that carries the most powerful[17] lexical specification of the two (Adger 2002)[18]. Let's recall that the Head has the ability to "license" or "select" the elements with which it *merges*. Also, the head X° passes on its categorial properties to its projection X', which in turn passes them up to the root projection, the phrase XP. So, if X° is, for example, an element that belongs to the category of "verbs" V, then the XP is a verbal phrase VP, as in the **X-bar model**:

8)



A second important assumption is the existence of a **Specifier**[19] as an element that is selected or licensed by the Head in the second step of *merge* (γ in example 8) above). The difference between a complement and a specifier is structural, i.e., it is a reflection of their relative positions in the structure: a complement is licensed by the verbal head, while the specifier is licensed by the complex entity formed by the *merger* of the verb and its complement. Both elements can belong to the same lexical category, for example both can be complete noun phrases. These structural elements are called "arguments". Structurally, the Complement is an "internal" argument and the Specifier is an "external" argument.

Another important point that will be determinant for the interpretation of the Sumerian verb phrase is **directionality**. The two main theories about the structures yielded by *merge*, Kayne's (1994) Linear Correspondence Axiom (LCA) and Haider's (1993) Basic Branching Constraint (BBC), require a preferred direction for branching[20].

This directionality requirement produces trees in which the Specifier is always on the left side of the structure. I will return to this idea in the discussion of word order.

Another observation about the X-bar model needs to be made explicit at this point: The X-bar model is a notational convention that enables linguists to discuss about the hierarchy of elements in a language. Like all notations, the X-bar notation implies a set of theoretical

[17] Here, the concept of "powerful" intends to convey one or more of the notions of abundance of specifications, their completeness, complexity, force, etc.

[18] The case where α and β have equivalent specifications is not considered in this work.

[19] Like in the case of Functional Heads (Haspelmath 2021), the theoretical foundation of the existence of Specifiers is doubtful, see for example Starke (2004).

[20] "Right branching" means that a syntactic tree (such as that of Figure 13) "grows" towards the right when seen from the top (the root). This growth analogy is only to explain the graph, and it does not require that the structure is built top-down, although that remains a possibility (see, amongst others, Phillips (2003) and Den Dikken (2018)).

models. The problem with the models behind the X-bar notation is that a large part of their basic background is the fruit of conceptual stipulations with no true basis, whether empirical or theoretical. In order to analyze a language, though, it is necessary to use some model. In this work, I use a very basic form of the X-bar model, despite its known shortcomings (note that even the Minimalist Program has left the X-bar model on the side), because I find it to be helpful to formalize the linear order (cartography) of a language.

3.1.3 Features and Agreement

Generative grammars assume that all basic elements in a language are characterized by **features** (Adger 2002). Features are then properties of language elements (words, morphemes, etc.). Features can be phonological, syntactical or semantical, each accessible only in their own module (for example, syntax does not have access to semantic features) (Rouverel 2015).

Regarding syntactic structures, it has been proposed that each terminal node bears one and only one feature. For lexical or functional elements that evidently have more than one feature, it is then necessary to add repetitions of nodes to the structure, like in verb clusters or shells. There is no complete consensus about this, but for the purposes of explaining syntactic structures in Sumerian, I will adopt the principle of "one head, one feature" for salient features, but won't insist on proposing many head projection repetitions when the features are not determinant for the discussion, which means that sometimes a node will carry more than one feature, at least implicitly.

Features are determinant to explain the phenomenon of **agreement**. Here again, the mechanism of agreement is not totally consensual. Followers of the Minimalist approach generally accept the "Probe-Goal" mechanism proposed by Chomsky (see, amongst many others, Den Dikken 2013). This agreement mechanism does not require movement, and therefore it can explain the cross-referencing characteristics of the Sumerian Slots 5-11 and 14, which are linked to elements in the outside of the verb.

3.1.4 Thematic roles, case assignment

Theta (thematic) **roles** describe the relationships the verb has with its arguments. The most important roles for our discussion are those of Agent and Patient, which often correspond to the arguments we call Subject and Object. However, the Subject is the Agent only for transitive verbs, and this is immediately visible in the morphology of Ergative-Absolutive alignments such as those of Sumerian, while Nominative-Accusative alignments usually do not show a morphological difference between agent and non-agent Subjects.

Theta roles are closely linked to **case assignment**. Case is the projection of thematic roles into the syntactic form. Case markings are morphologically explicit in Sumerian, in the nominal group as well as in the verbal group. Case markings in the nominal group are relatively straight forward, but the case cross-references in the verbal domain are probably of a different nature. Elements in the verbal domain, in Slots 6-11 and 14, are clearly related to Case relationships and properties, and therefore connected to Theta roles. Consequently, there is an agreement relationship between the case markings of the nominal arguments (the full DPs containing grammatical Subject and various Objects) and the verbal prefixes and suffixes. The morphemes in Slots 6-11 cross-reference the verb arguments in a way that recalls clitic case

morphologies in Indo-European languages, and Slot 14, which behaves like a verb inflexion for person in Romance languages, is also clearly related to case (absolutive).

3.1.5 Movement

Many languages display structural behaviours that have been explained through a mechanism called "syntactic movement". Elements that appear at a given position in the structure seem to have their natural place at some other position, from which they were displaced before the formation of the phonological form that is uttered. There are different theories about movement that differ with regard to the motivation, constraints and also to what, if anything, is left at the putative original place to which the element is said to belong.

There is no wide theoretical consensus about the mechanisms and motivations of movement. Besides, generative grammars consider several types of movement (Head movement, A movement, A-bar movement, Quantifier Raising, Wh-movement), each having different hypothetical motivations and constraints. Some non-generative grammars reject the idea of syntactic movement and semanticists replace it, at least partially, with mechanisms such as type-shifting.

Some linguists, like Brody (1995), have proposed that there is no need for syntactic movement to explain the structure of languages. Brody's proposal is a "*theory of grammar that contains no movement rules and no derivations in the usual sense*". In this theory, Lexical-Logical Form or LLF representations are projected from the lexicon in one step, thus avoiding the many mechanistic complexities that have been necessary to explain language structure in the earlier generative theories, including the (non-radically) minimalist theories. In Brody's words; "*Only the radically minimalist theory can strongly explain why no constraints hold at non-interface structures: because they do not exist*."

For the purposes of this work, I will either avoid the theory of movement, or else use it as sparingly as possible (for example, one can invoke some kind of "conceptual movement" – i.e., before syntax, at the conceptual level – to explain the placement of Focus and Topics in an utterance, without accepting a mechanical "syntactic movement"). Fortunately, Sumerian seems to generate its elements at the place where they appear in the great majority of cases. Interrogative phrases in Sumerian are of the *in-situ* type and the verbal clitic-like morphemes in Slots 6-11 and 14 are redundant with respect to their cross-referencing elements, so there is no immediate need to invoke movement.

However, imperative constructions show the verb stem, which is usually inside the verbal block (Slot 12), at the front of it. A conceptual need to highlight the imperative predication is the most immediate explanation for this difference (more about imperatives in section 3.2.4, p. 32). The fronting of the predication idea before the syntactic structure is generated could be determining the final linear order. In practice, when looking at the empirical data, such fronting can also be described as a "movement" after syntax and before phonologization. But, as for any syntactic movement, there is no theory justifying the additional brain effort needed to create a structure and quickly modify it – often in a very significant way – before it is uttered. Based on the principle of economy, it seems more logical to suppose that highlighted elements such as focus, topic, "why" interrogations, etc., including imperative predications, are fronted in a conceptual phase before syntax and then are generated directly in the positions in which they appear in the clause (an explanation that is compatible with a "top-

down" built-up as proposed by Phillips (2003), Chesi (2007) and others, also considered, up to a point, by Den Dikken (2018)).

3.2 Heads and structure

3.2.1 Functional and Lexical Heads

According to the definition adopted above, in section 3.1.2, the head is one of the two elements of a *merge* operation. The head element distinguishes itself by its more "powerful" lexical specification. Within this frame, there are two types of heads:

- Lexical Heads are those that carry a semantic value by themselves, like verbs, nouns and adjectives. They determine the truth value of the phrase.
- Functional Heads are those that carry abstract information about the predication – like the Tense Head, which informs about the temporal conditions and circumstances, or the Prepositional Heads, which inform about spatial circumstances – without semantic or truth value.

But this theoretical "black and white" separation does not describe reality accurately. Hageman (2012) proposes that there is no clear-cut dichotomy and that "hybrid", semi-lexical, semi-functional heads must be taken into account.

This remark is important for our interpretation of the Sumerian verbal domain. In its lexical specification, the verb contains grammatical elements that act on its surroundings like Functional Heads do. Conversely, an inflexion head, which is viewed as Functional, contains semantic, truth value related information, like Person and Number. As it will be seen in Section 5, this idea of hybrid heads has the potential to enable cartographic interpretations that would be seen as unacceptable "on principle" if a black and white separation of Functional and Lexical heads is accepted.

Another important idea about heads is related to their action. By means of their inherent specification power, heads "select" the other component of the *merge* operation. in other words, heads provide an authorization of sorts for the pursuit of the *merge* operation, a "licensing". If the head is on the right side of the *merge*, then the licensing is from right to left. Alternatively, if the head is on the left, the licensing obviously goes from left to right. I discuss directionality of licensing in some more detail in Section 4.1, below.

3.2.2 Tense and Aspect

The idea that Tense, Aspect and Mood (TMA) are three facets of a single system is widely accepted in Linguistics. These three grammatical categories are "entangled" in a way that – in some languages at least – makes it difficult to distinguish one from another.

However, Aspect seems to be a functional property within the verbal domain, while Tense, like Mood, is clearly outside it (see for example, deMena-Travis 2010).

In the entangled TMA system, Tense expresses the *relative* timeframe in which the verbal Event takes place (past and non-past, or future and non-future, or a sequence past-present-future); Mood expresses the connection to reality (*realis* or *irrealis*, i.e., assertion or hypothesis); and Aspect expresses the state of the Event (finished or unfinished, i.e., perfective or imperfective). Languages do not use a single system for TMA. Some, like Present

Day English, use mostly a timeframe system of Tense with some indication about Aspect (for example, the progressive inflexion "*-ing*") and some hint about a Mood that is not indicative (formalistic wishes like "*may this be a happy day for you*"). Others, like the Romance languages, use explicit and separate morphology for each of Tense, Aspect and Mood, concatenated as suffixes of the verb, often fused into one single morpheme. Others yet, like Sumerian or Chinese, do not use a Tense function and describe timeframes with Aspect and adverbial help and Mood with analytical constructions.

Building on Hale and Kersey (1993, 2002), who had looked at several languages, including Navajo (which presents some similarities with Sumerian), deMena-Travis (2010) divides syntax into two domains: S-syntax, the "syntactical syntax" and L-syntax or "lexical syntax". The latter domain refers to the building up of the lexical entry, while the former is the traditional domain of syntax.

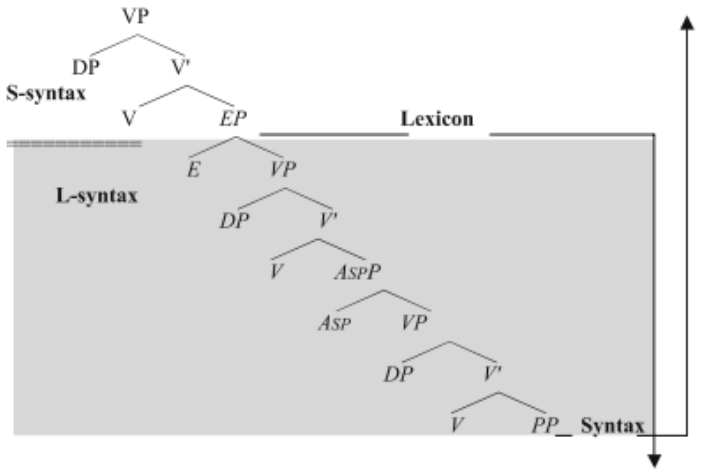


Figure 3. S-Syntax and L-Syntax of the VP (deMena-Travis 2010, p. 190). E is for Event.

As it will be seen in Section 5, this notion of L-syntax enables us to explain the *ḫamtu/marû* dichotomy, and also the **-/ed/** suffix in Slot 13 in the Sumerian VP template. On the other hand, S-syntax could help to explain the inflexional Aspect morphemes in Romance languages by the presence of a functional Outer Aspect head above the VP. However, linearization under this premise might lead to morpheme orders that do not correspond to the empirical data. In that case, it becomes necessary to consider that the lexical specification of a verb may come into syntax already equipped with inflexion for aspect, as it seems to be the case in Sumerian.

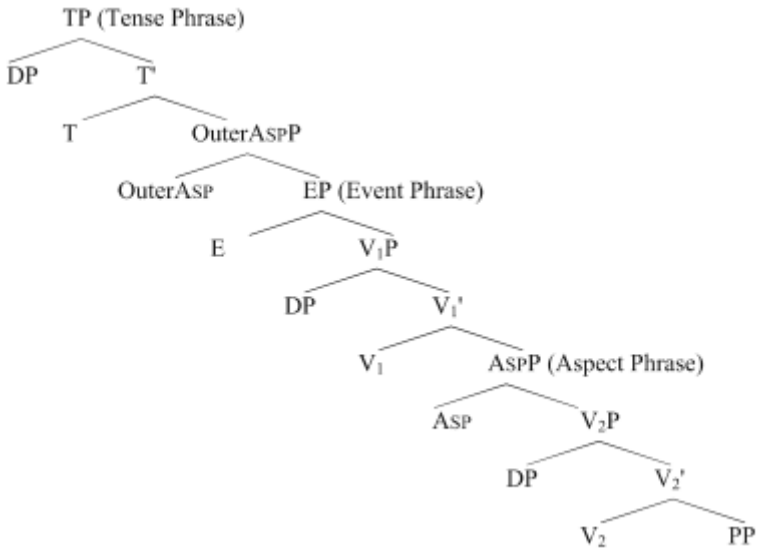


Figure 4. Phrase structure with Outer and Inner Aspect heads (deMena-Travis 2010, p. 187).

3.2.3 Voice

Grammatical voice has been studied by grammarians since Panini (Sanskrit) and Thrax (Ancient Greek). Because of the many historical approaches to the question, there have been several different ways of describing it. In a recent work, Zúñiga and Kittilä (2019) give a systematic description of the terminology and analytical properties necessary to describe Voice.

Zúñiga and Kittilä (2019) define Grammatical Voice on the basis of diathesis, i.e., the mapping of semantic roles onto grammatical roles. In other words, the mapping of the roles of Agent and Patient (or Theme, Beneficiary, Goal, etc.) onto the syntactic elements of Subject and Object, respectively. In their words:

> "*Diathesis refers to the number of semantic arguments involved in a state of affairs, to how they are involved in it, and to how they are assigned to GRs* [grammatical roles] *of varying salience and flexibility. Voice refers to the way a specific diathesis is formally marked on functional or lexical verbs in the predicate complex*."

Therefore, Voice is a function in the syntactic structure and as such, one can show it as a Functional Head in the spine of the phrase, as in Figure 5 below.

In her study about voice in Acehnese, Legate (2012) describes a prefixed passive:

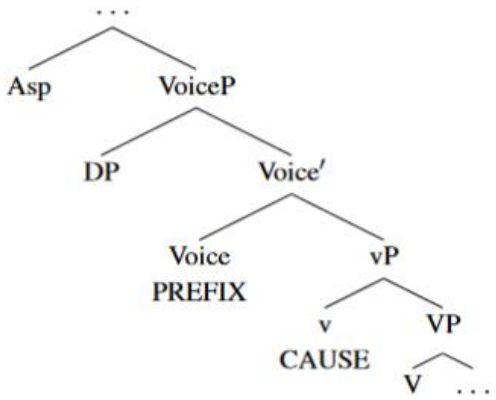


Figure 5. Syntactic structure of voice (Legate 2012, p. 29).

Acehnese is then similar to Sumerian with respect to the existence of this prefix. I will adopt this view for the description of Sumerian passives in Section 5.

3.2.4 Imperatives

Although imperative clauses can be extremely simple (for example the short injunction: "Go!"), decades of linguistic research show that their syntax is complex. In a thorough analysis of imperatives across languages, Alcázar and Saltarelli (2014) decompose their many aspects and complexities.

First, there is consensus on the idea that imperative is not a sentence type as those that can be featured under the ForceP node in Rizzi's (2004) left periphery, i.e., the *declarative* and *interrogative* types.

Since ForceP cannot house the imperative element, several theories have been proposed to make a syntactic place for it. One of them is the JussiveP proposed by Zanuttini (2008). The JussiveP is a functional node above the VP that can host a light form of the verb, a vP, that carries the imperative feature. Depending on the language and on the type of imperative, it could be located at different places in the hierarchy between the Root (ForceP/CP) and the VP. According to this and similar theories, this node functions as a verbal auxiliary rather than as a full lexical element. Therefore, it may have the same morphological form as V – usually the form of the "bare" verb – but with an additional functional content. In Zanuttini's proposal, the main verb must undergo head movement from the VP to the JussiveP.

Alcázar and Sartarelli (2014, p. 105) propose a theory called LPH (for Light Performative Hypothesis), based on previous research (the Performative Hypothesis) that started already around 1960. The LPH integrates context-related parameters such as the *Speaker* and the *Addressee*. The LPH interface derivation defines the syntactic Subject as the *Addressee*, thus helping with the understanding of extended imperatives such as hortative or exhortative expressions. Additionally, the LPH theory assumes that a high functional node bearing the IMPERATIVE feature (the Illocutory Force, [IF]) licenses the lexical verb in the lower phrase, the VP, and it also assigns the theme role of the *Speaker*.

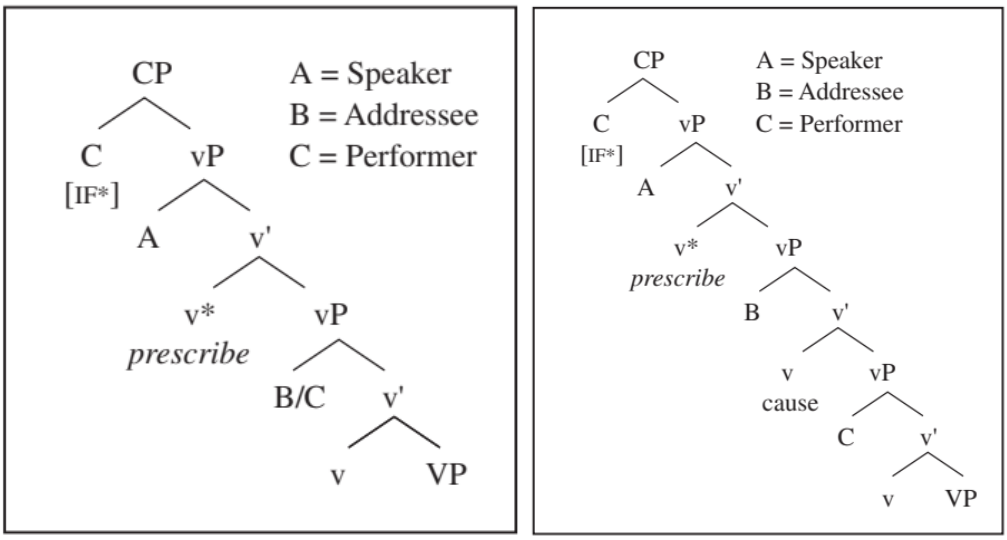


Figure 6. Canonical imperative (left) and hortative (right) constructions in English (Alcázar and Saltarelli, 2014).

The LPH deals with the Speaker> Addressee relation as a form of licensing from the contextual phase (the CP) to the content phase (vP).

The advertised advantage of the LPH theory is that it does not require the adjunction of a dedicated functional head such as the JussiveP. The imperative feature in the vP is licensed by the Illocutory Force feature through a probe-goal mechanism (Figure 6). Therefore, in this theory, there is no need to invoke head movement of the verb towards T or C or any other functional head. But there is need to create a vP shell of sorts, which puts the light verb at the top of the verbal complex.

The details of the factors and mechanisms involved in imperative syntax and pragmatics are beyond the purpose of this work, but can be found in Alcázar and Sartarelli (2014) as well as in many other works (for example Rupp (2003), van der Wurff (2007), Isac (2015)).

3.2.5 Adverbs

Cinque's (1999) Cartographic Theory proposes that adverbs are adjoined to functional heads above the VP, in Specifier positions. According to Cinque, these adverbial functional heads follow a universal order that applies to all studied languages (for a recent discussion of this topic, see Tescari Neto 2022). Ernst (2020), in what he calls the Scopal Theory, thinks that there is no such fixed sequence of functional nodes and therefore adverbs can adjoin to any place in which their scope makes semantic sense.

Sumerian lacks adverbs in the sense of English (Jagersma 2010, p. 69, 83). But the prefixes in Slots 7-10 of the VP are called "adverbial prefixes" (Zólyomi 2017), because they affect the verb (its valency) in a way that reminds the concept of applicatives in cases of head-final languages like those of the Iroquoian family (Mithun, 2002).

Jagersma (2010) and other authors avoid the mention of this adverbial property and call these prefixes "dimensional prefixes" (for example, Foxvog 2016).

3.2.6 Clitics, affixes or pronouns

As briefly discussed in Section 2 above, the Sumerian prefixes in Slots 5-10 appear adjoined to the verb spine in a way similar to clitics. But they could also be considered as inflexional affixes or even pronouns in an extremely "non pro drop" system.

It is difficult to find a clear definition that would differentiate unequivocally between these three types of syntactic elements. Different models provide different characterizations (see for example Spencer and Luís, 2012).

One important criterion is phonology. Clitics don't have autonomous accent (Anderson 2005, p. 12). But this is not a useful indication for Sumerian, because we do not really know how Sumerian sounded. It is possible that the prefixes had no autonomous accent, or perhaps there was a system that put the stress on the syllable that happened to be at some point in the word, for example the last one, or the first one, or the penultimate, as in Latin.

Aside of the phonological criterion, Anderson (2005), citing A. M. Zwicky, gives a number of other factors that help identifying a clitic: word order (clitics may appear in an order different from the normal order in which the objects are placed), binding (if it is clearly bound, then it is an affix), construction with affixes (if there is a clear affix nearby), immunity to some syntactic rules (such as deletion under identity).

In the case of Sumerian, most often (practically always) there are several prefixes in the verb phrase. The criteria mentioned by Anderson are not determinant to decide whether we are in presence of simple affixes, inflexions or indeed clitics. It is quite clear, though, that these morphemes are not self-standing pronouns.

3.2.7 The left periphery of the clause

After Rizzi (1997), many authors have explored the "left periphery" of VO languages of the Indo-European family as shown in 9). Saito (2010), looking at the distribution of the three complementizers of Japanese (an OV language), proposes a parallel "right periphery" as in 10):

9)

[… Force [… (Topic*) [… (Focus) [… (Topic*) [… Finite [TP …]]]]]] Rizzi (1997)

10)

[… [… [… [… [TP …] Finite] (Topic*)] Force] Report] Saito (2010)

Since Sumerian is similar to Japanese in terms of word order, we can expect an equally similar behaviour. In fact, as seen previously, the nominalizer (also called subordinator) morpheme **/ʔa/** is translated as a complementizer or a relative pronoun, and it appears, as expected, at the end of the standard clause, in the last position of the verbal complex, Slot 15.

Saito's OV configuration is an exact mirror image of Rizzi's VO configuration. There is no doubt about the placement of the complementizer, which is empirically found at the end of the Japanese or Sumerian sentence. However, the location of the so-called finite markers in Sumerian in Slot 2 does not fit in a mirror image of Rizzi's left periphery.

3.3 Split ergativity

Ura (2006) proposes a mechanism for aspectually conditioned case attribution that applies to the split ergativity of Sumerian. Based on abundant work by Typologists (for example Mahajan 1996 and references therein), Ura starts with the fact that most of the known ergative languages have a head-final syntax. More precisely, only verb peripheral languages (SOV, VSO and OSV orders) display ergative case. Verb medial orders, like SVO, do not have the choice to use ergative case.

Here is a summary of Ura's theory (simplified):

3.3.1 Perfective aspect

In order to explain why ergativity in some languages applies only to perfective constructions, Ura proposes a parameter that allows the perfective transitive verb to attribute ergative case directly (without movement) to the external argument (SpecV). Once the ergative case has been attributed to the Subject, the Object (of transitive verbs) gets an unmarked case that is assimilated to absolutive. Intransitive verbs, in this view, do not attribute ergative case, but an unmarked case[21] that could be nominative or absolutive. Since intransitive verbs do not license an Object, the only case is the unmarked absolutive/nominative of the Subject.

3.3.2 Imperfective aspect

In this theory, verbs in the imperfective aspect do not have the possibility to attribute case directly (see section 3.4.2). Ura invokes the EPP feature (Extended Projection Principle, or the need to have a Subject NP or DP in the SpecIP position) to explain how the imperfective Subjects, whether transitive or intransitive, get a nominal case through movement to the specifier of the Inflectional Head. In parallel, the Objects of transitive verbs get an unmarked case that can be called accusative.

3.3.3 Lexical specification and case assignment

Ura's explanation requires one additional provision. Why is it that only perfective verbs can attribute case without movement? To answer this question, Ura cites Lisa Travis' proposal (Travis, 2000), discussed above in section 3.2.2, according to which there are two types of Aspect: Lexical Aspect (or Inner Aspect) and Grammatical Aspect (or Outer Aspect).

Lexical aspect is inherent to the verb form, i.e., it is part of the verb's lexical specification and therefore it is a property that can be used to license or select the arguments. Opposite to this, Grammatical aspect is provided by a grammatical function outside the verb.

In some languages, like Hindi, the perfective form of transitive verbs contains a lexical specification that licenses or selects an ergative (agentive) external argument and attributes ergative case to it *in situ*. If there is an internal argument, it gets a non-marked case that is called absolutive by opposition to the ergative. Perfective intransitive verbs, which have only one argument, do not possess a lexical specification to attribute case; or else, their lexical specification enables them only to give a default, non-marked case.

In these languages, the imperfective form's lexical specification (whether transitive or intransitive) licenses only a non-agentive external argument, without case assignment. In this last case, in Ura's theory, the external argument is licensed through movement by an external

[21] This unmarked case could be also a lack of case. In situations where there is only one argument for the verb, there is no need for a case distinction.

functional head, InflP, and gets nominal case, while the internal argument, if there is one, gets the default unmarked case.

As seen before (Section 2.3.4) the Sumerian verb has two clearly separated aspectual morphologies, *ḫamtu* and *marû*. Different morphologies probably have different lexical specifications. Ura's theory is then compatible with the empirical fact.

However, Ura's need for the EPP feature needs to be refined to be used to explain the Sumerian prefix related to ergative or absolutive case (Slot 11) and the suffix related to nominative or absolutive/accusative case (Slot 14).

The EPP hypothesis has been abandoned by the latest Minimalist thinking. And since it wouldn't work for the Sumerian verb structure anyway[22], one can try to explain the case in Slot 11 as in Ura's theory of *in situ* attribution by perfective transitives, and the case in Slot 14 through agreement heads above the VP, AgrSP for intransitives and AgrOP for transitives. But there are many problems with this view. First, there is no principled theory for the placement of Agreement heads just above the VP. And in the particular case of Sumerian, there is no theory able to explain the alternations controlled by Aspect and Transitivity through agreement. Furthermore, AGR heads above the VP cannot be lexical; if they exist, they would have to be functional and they would rather be on the left side of the spine. Therefore, AGR heads cannot explain the content of Slot 14.

To solve these problems, I will use the concepts of event structure, argument structure, aspect and telicity, discussed in Section 3.4.

3.4 Lexical architecture, transitivity and ergativity

3.4.1 Arguments and the lexicon

In most, if not all, the languages of the world, the behaviour of transitive verbs is different from that of intransitive verbs. Intuitively, this difference must come from the difference in the type of lexical specifications these verbs carry. Ramchand (2008) proposes two strategies to explain the differences through wide generalizations:

1. A lexical-thematic approach, in which role types and similar specifications are encoded in the lexicon, i.e., before syntax, from where they are projected directly into the clause structure. In her words, "*the lexicon is a 'submodule' of the language faculty since it has its own distinct primitives and modes of combination*."
2. Or a generativist-constructivist approach, in which a syntactic machinery is free to pick up elements from the lexicon, albeit based on the encyclopedic knowledge of their meaning, and attach them according to its own rules, i.e., "the grammar".

In the first approach, the lexicon would have to be dynamic and contain argument-structure information that will end up determining the final syntactic structure. This dynamic lexicon would have its own mechanistic rules to build up words based on concepts and give specification power to them. Accordingly, only a minor part of the alternations and variations of the language would be due to the syntactic process proper.

[22] Sumerian phrases have separate nominal groups functioning as explicit Subjects preceding the verb complex – probably in Focus or Topic positions –, in addition to the case-related, pronoun-like morphemes that are close to the verb. Furthermore, Sumerian has no Tense or Inflection head to host the EPP feature.

In the second approach, the lexicon would be static and would contain only conceptual-encyclopedic information. No lexicon-internal manipulations would exist before syntax, which would have the faculty to alter the lexical information contained in words in order to create a syntactic representation of a clause or sentence.

Most likely, the closest image of what really happens in language is somewhere between these two extreme views. There indeed is evidence about Functional Heads that alter the manifestation of lexical entries (for example, the requirement for the subjunctive in some modal constructions in Romance languages). And there are many theories and approaches to semantics that propose that there is some elaboration or transformation of the "standard" meaning and scope of words before the sentences are uttered (like QR raising, type-shifting, etc.). On the other hand, it is not possible to explain everything through "simple" syntax rules. For example, the mechanisms of tense, mood, aspect, person and number inflexions in Romance languages, or the correlates between thematic roles and structure.

Ramchand believes that the lexicon cannot exist as a module of the language organ, mainly because it cannot be isolated and encapsulated[23]. Lexical information associates representations from radically different cognitive modules (conceptual, articulatory, formal). For her, there is only one combinatorial module, the syntax, which mediates the association of lexical items and syntactic structure. Argument structure is, then, a result of this process of association.

Importantly, though, Ramchand also believes that "*the lexical item does come with syntactic information, but only that of category features – primitives that the syntax is independently known to manipulate*."

If we follow Ramchand, we can conceive syntax as the addition of some lexical prework – perhaps very different from syntax, but perhaps not so – and a main process of ordering the language elements according to a scheme that can be interpreted as a whole (as a clause). This high-level view implies that syntax is done in steps. These steps lead to "phases", i.e., smaller structures within the clause structure that Chomsky described as "*the smallest syntactic object which* […] *has an interior that is immune to change*" (Gallego 2012), but which can also be characterised as a substructure resulting from a prior process that is used as a building block by the main syntactic process. This phased structure enables the cartography of Sumerian that I will propose in section 5.3, in particular with respect to Aspect-controlled split ergativity.

Regarding arguments – after a long reasoning to identify the differences in their linguistic behaviour –, Ramchand notes that there is indeed a fundamental difference between internal and external arguments. External arguments are initiators of a process (the *causers*), while internal arguments undergo these processes or are the result of them. A subset of internal arguments brings additional descriptions of the event or process (paths, locations, etc.). So, the syntactic structure of the verbal domain must be analysed as the structure of an event, with its participants organised as initiators (cause), undergoers (process), results, paths, etc.

[23] The same can be said of all syntax. I suppose Ramchand means to say that if there is a combinatorial pre-work in the lexicon or at the moment in which the words are taken out of the lexicon, then this process must be executed by the same engine or machinery as all the other syntactic processes, and therefore a separate module does not exist.

To summarize the above, Figure 7 shows a tree representing the event-structure of the verbal complex in a head-initial configuration.

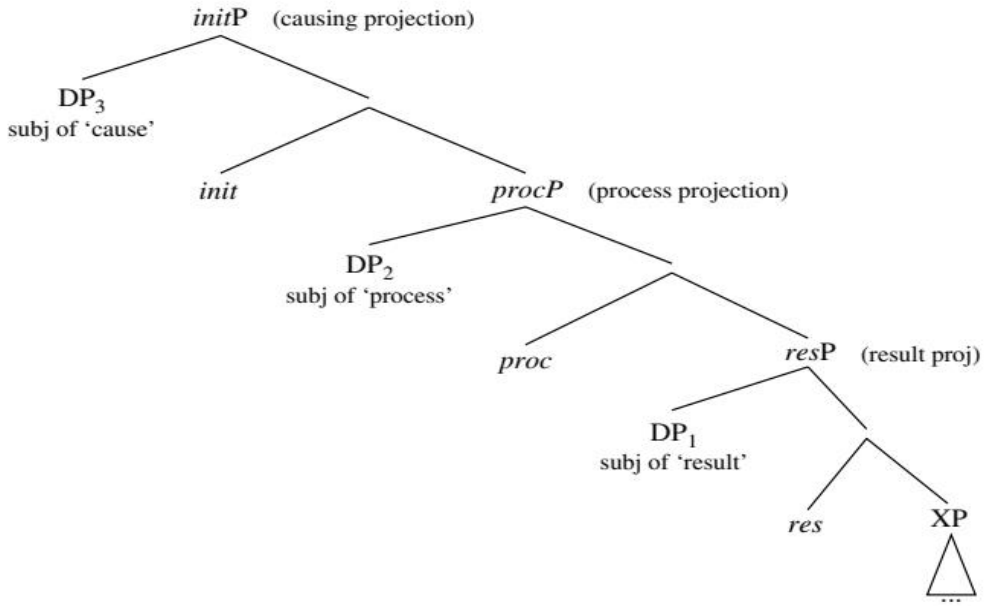


Figure 7. Event-structure of the verb (Ramchand 2008, p. 39).

Figure 8 shows the mapping of the argument structure (semantic) into the argument structure (syntactic). I use a head-final structure to make it appropriate for Sumerian.

Ramchand attributes the participant roles of *Initiator*, *Undergoer* and *Resultee* to the elements occupying the respective "Subject" positions, the *THEMES,* based on their relationship with the predication element. DP arguments that are not "Subjects" of a subevent are called *RHEMES*.

Other participant roles are mentioned by Ramchand, such as *Path*, *Goal*, etc. For the present work, we do not need to discuss these other roles, especially since they are often expressed through the use of prepositions, and Sumerian has no prepositions or postpositions.

The concept of *telicity* is included in Ramchand's reasoning, because a Result requires an end point. Telicity manifests itself as a feature associated to the Aspect head.

A mapping of event structure onto argument structure requires the insertion of multiple verbal heads (InitV, ProcV and ResV in Figure 8). In order to make this fact coherent with speech in the real life, we need to assume that only one of a group of verbal heads that use the same lexical entry is pronounced (the first or upper instance). Obviously, if the subevents map to different lexical entries, like "make" and "do" in the causative "she made me do it", each of them is pronounced (but only once).

Ramchand's (2008) view of the lack of combinatorial mechanisms in the lexicon make syntactic movement indispensable (for example to explain inflexion phenomena in Romance), contrary to Brody's (1995) view. There is no evidence of syntactic movement in Sumerian, at least in my interpretation. Therefore, there is reason to think that the lexicon cannot be entirely static or inert. In particular, the *ḫamtu/marû* dichotomy in Sumerian points towards the existence of some combinatorial and selection process that must occur before syntax.

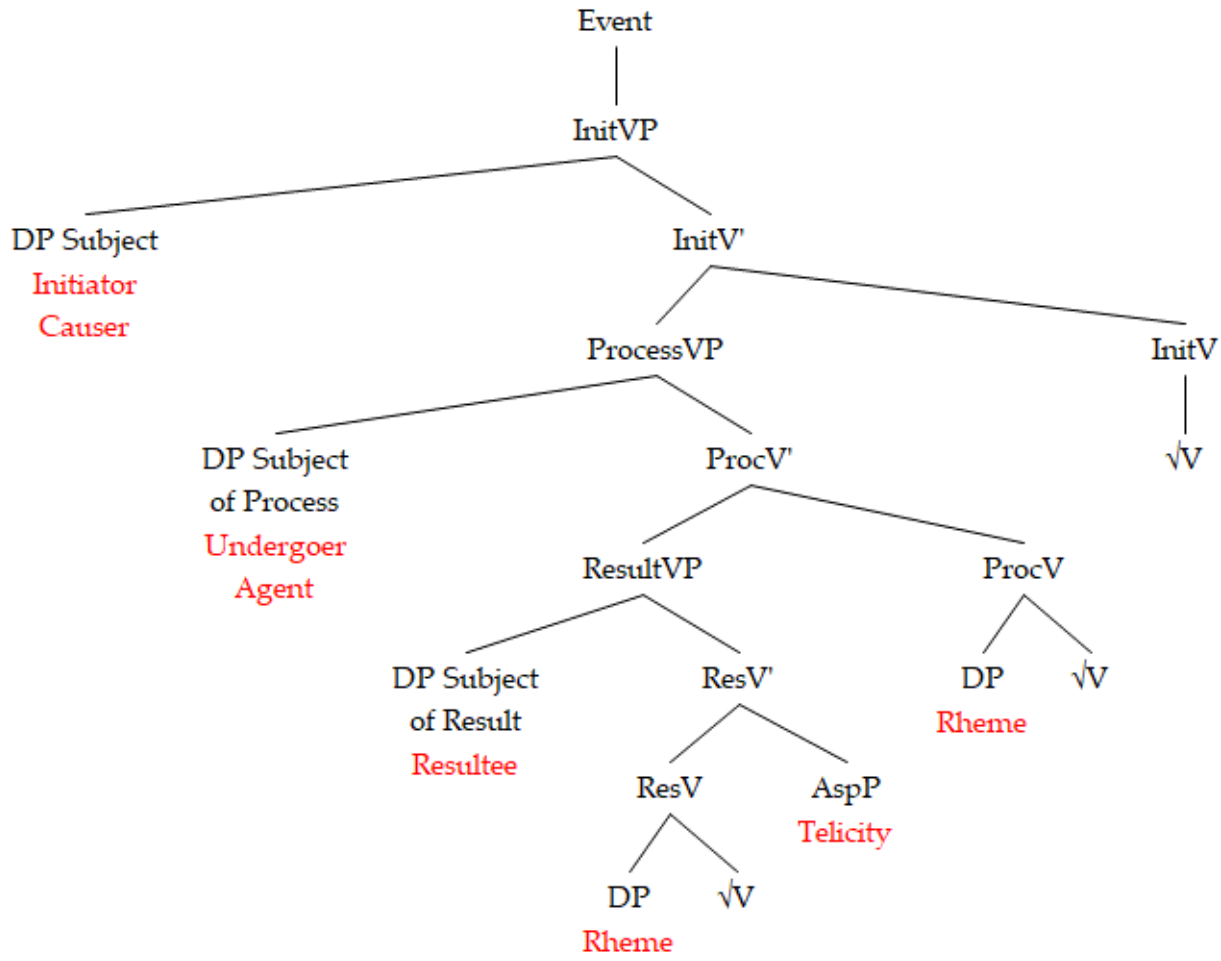


Figure 8. Mapping of the event structure into a head-final argument projection structure.

3.4.2 Event structure and argument structure

Van Hout (2000a, 2000b) looked at the alternation between transitive and intransitive forms of verbs like *eat* or *drink* in English, Dutch and Russian. Her studies show that transitive and intransitive verbs depict different types of events. In a way parallel to that chosen by Ramchand (2008), Van Hout describes predication in terms of events. Verbs, the most common expression of predication, are then descriptions of events. And events have an internal structure. Van Hout, building on previous work by Pustejovsky (1991) and others, distinguishes three types of basic event structures:

- State, a single event that is evaluated alone, i.e., relative to no other event.
- Process, a sequence of events identifying the semantic expression.
- Transition, an event identifying a semantic expression that is evaluated relative to its opposition (to an event that identifies the opposite semantic expression).

In Figure 9, "e" is a variable that designates a single event and "E" is a metavariable that refers to any one of the basic types, which makes Transition events recursive. For example, an accomplishment is a T event composed of two subevents, a Process and a State.

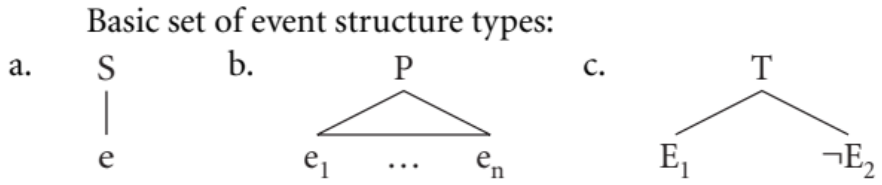


Figure 9. Basic event structures (Pustejovsky 1991, Van Hout, 2000b).

Events can be telic (having an end point) or atelic (not having an end point). Telicity is a semantic property.

Aspect, on the other hand, is a grammatical function that adds precision to the verb's depiction of events. The perfective Aspect is used to describe past situations that have ended and have a relevance for the present, while the imperfective describes situations in their entirety, independently of any temporal parameter and of whether they are finished or completed (Comrie, 1976). We can see in this definition the entanglement of Aspect and Tense, by which the perfective always refers to a past situation, but the imperfective is atemporal.

It is important to keep in mind that perfectivity/imperfectivity and telicity/atelicity are two separate aspectual concepts.

Transitivity, a lexical property, is associated to telicity if the Aspect is perfective. Imperfective transitives are not telic, i.e., the imperfective event does not characterise an end point. Conversely, intransitive verbs in the perfective aspect can imply the existence of and end point – at least in some cases (like *I am gone*, *I went*) –, but not so in the imperfective (*I go*).

In Van Hout's examination of transitive/intransitive transitions, she observes that

> (i) Every predicate is lexically specified for its event structure.
>
> (ii) Event structures determine mapping to syntax.
>
> (iii) Event structures can be combined into complex event structures forming the basis for complex predicates.

Point (ii) leads to a mechanism to position the arguments of a verb based on the lexical specification of the event. For Van Hout, "*lexical specification is simply arbitrarily listing a verb's possible frames*". The frame is the type of structure in terms of number of participants and their respective positions in the syntactic structure, either internal or external arguments of the verb (the event).

Intransitive verbs have the event structure of States or Processes. These events require the identification of an owner, possessor or initiator. In the mapping to syntax, the possessor is associated to thematic roles of beneficiary, experiencer, or maybe force/natural cause. They do not require the presence of an object, although their frames can include optional indirect or oblique objects that determine location in space or in time, or else paths, goals, etc.

Transitive verbs, on the other hand, have the event structure of a Transition. They must identify an entity that undergoes the transformation and an agent that executes it. The transitive frame has then at least two arguments, and sometimes more (ditransitives).

In Van Hout's view, the way arguments are mapped into the frame or structure is controlled by telicity.

Telic events identify obligatorily the object and project it into the syntactic structure in the position closest to the verb (internal argument). The other argument, the agent, is then projected as the owner or initiator of the transition to a position traditionally called "the Subject" (external argument). Transitive and unaccusative verbs can be telic, but only in the perfective Aspect.

Atelic events identify first the owner or initiator and map it into the syntax according to its semantic role, not necessarily as Subjects (for example unergative verbs). Oblique objects, if they exist, are mapped then into the next available positions in the frame. The mapping process includes case assignment, which can be morphological or not, depending on the language. Unergative and conative[24] frames are always atelic, independently of Aspect.

Van Hout explains that "*the projection of a transitive or intransitive structure is not dependent on the number of thematic participants a verb has, but rather on its event structure*. […] *atelic activity predicates do not project an object*[25]*; telic accomplishment predicates need to project an object*".

Since a transitive verb in the imperfective aspect is atelic, we can expect its mapping process to be similar to that of the intransitive atelic verbs. Van Hout (2000b) sees this similarity of mapping in Russian, where verbs alternate between transitive/telic and intransitive/atelic characteristics depending on the aspect.

In Section 5.4, I will apply Van Hout's view to the explanation of the Aspect controlled alternations described in Table 6 (p. 24).

3.5 Applicatives

The previous sections provide the theoretical basis to explain the Aspect controlled alternation between *ergative/absolutive* and *nominative/accusative* case alignment in languages such as Hindi and Sumerian. We need now a way to explain the cartography of verbal affixes. For this, we can turn to the concept of applicatives, as proposed by Niedzielski (2017).

Jeong (2007) explains that the term *applicative* was coined in the 17th century by Spanish missionaries describing an Uto-Aztecan language from today's Mexico.

Applicatives are affixes that attach to the verb and change its valency. Pylkkänen 2002 describes two main types of applicatives: those that are above the verb or High Applicatives, and those that are below or Low Applicatives. High Applicatives add participants to the event by changing the relation between an event and an individual (which then becomes a participant), and Low Applicatives change the type of relation between existing participants.

[24] Conative: Pertaining to a striving action, attempting to do or achieve something.

[25] This assertion is not clear: transitive predicates in the imperfective aspect do project an object, as in French: "*Jean lit le journal*"; "*lit*" ("read") is atelic, and the object is clearly present.

There are many studies about Applicatives and their complexity (Pylkkänen 2002, Mithun 2002, McGinnis 2002, Jeong 2007, Peterson 2007 and many others). But for the present work we need to retain only the property of adding participants to the event by inserting nodes in the verbal domain.

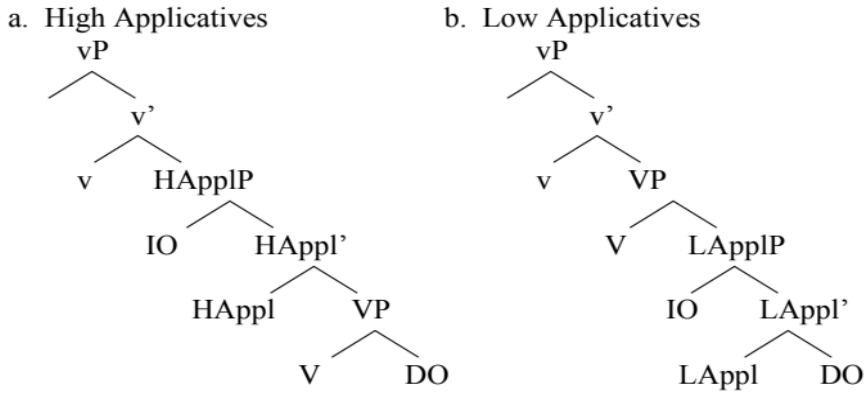


Figure 10. Syntactic positions of High and Low Applicatives (Jeong 2007).

McGinnis (2002) corroborates the existence and the syntactic positioning of Applicatives using phonological and semantic effects as evidence. She concludes that the processing of Applicatives requires a phase-based approach, since movement out of the verb shell (the adequate Applicative position) towards the T function – which populates the clausal Subject position – happens only after processing of the Applicatives.

All the mentioned authors approach Applicatives through VO ordered examples. In order to use this concept in Sumerian, we need to reformulate their trees with an OV order and account for the multiple slots (Figure 11).

In the X-Bar modelled structures used in Figure 10 and Figure 11, the High Applicative morphemes occupy the Specifier positions, while the High Applicative heads are copies of the verb. In a Strong Minimalist approach, this view can be simplified by eliminating the verb copies and assuming that the applicative nodes are intermediate projections of the verb.

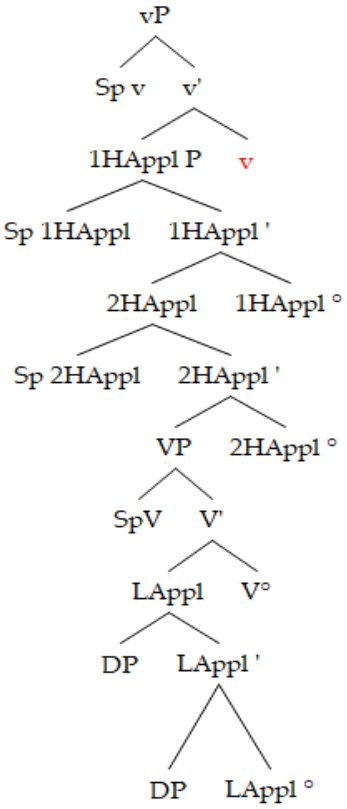


Figure 11. Multiple High Applicatives and a Low Applicative in a head-final structure.

4 Word order and syntax

4.1 Merge constraints, directionality and licensing

The *merge* operation appears to be antisymmetric from the beginning. As observed by several authors (amongst others: Kayne 1994, Haider 1993, Chesi 2007, Cinque 2009), natural languages show a tree structure that grows from the root (the beginning of the clause) towards the foot (the end of the clause) by making branches on the right side[26]. The main difference between languages resides on the choice of the position of the head: either head-initial or head-final.

Kayne's LCA establishes that all phrases in all languages are head-initial, using the structure of 8) (page 26), with the head on the left side, flanked on its own left by the specifier and on its right by the complement. Kayne's arguments include the observation that c-command is an asymmetric relationship and that all instances of putative rightward movement can be explained by leftward movement out of a lower position (Kayne 1994, 2010).

Haider's BBC also states that the *merge* operation is constrained to grow towards the right (if seen from the top, or root) as in the LCA. But the preferred or most basic position of the Head is on the right ("head-final"). The BBC accepts that heads might be located on the left side of the merged branch, because the parsing of the resulting phrases is easier with a head-initial configuration. Haider (1993, 2013) proposes that the criterion that guides the choice of configurations in human language phrases is a balance between the brain effort invested to create grammatical structures (production) and the effort to "parse" them (interpretation). Head-final phrases are faster (simpler) to build-up or produce, but head-initial phrases are faster to interpret. The balance can tip in either direction and languages chose their word order in a parametric way. Haider bases this thinking on the fact that a short majority of the studied languages has a head-final configuration, but a strong "very close second" minority is head-initial. To corroborate the idea that head-final is the basic order, we know that many head-final languages became head-initial through diachronic evolution, but there is little or no evidence of the inverse process, i.e., languages that may have become head-final after having been head-initial.

As mentioned before, one of the main problems of the LCA theory is that it explains OV grammars (object first, verb last, or head-final VP) as the result of an original VO order that is systematically altered by leftward movement. While such movement does explain the final structure, the LCA does not explain what would be its motivation and which would be the trigger to execute the movement. Based on economy considerations (why would the brain spend energy and resources moving large, whole structures around, instead of building them in the final order from the beginning?) and on empirical as well as explanatory adequacy, Haider (2013) rejects the LCA.

Reciprocally, Kayne and other authors reject the BBC parametric choice between OV and VO, based on the idea that the natural asymmetry of human languages (asymmetric c-command) requires a Specifier-Head-Complement order (or at least a contiguous Specifier-Head) configuration. If other orders were natural, then the hierarchies and scopes would have to be

[26] This description is only about the graphical appearance of the syntactic tree. It does not entail that the human brain builds up clauses in a "top-down" mode, nor does it discard the possibility that it happens in that way. Conversely, it does not say that the brain builds up sentences from the "bottom up". It only says that the syntactic trees in natural languages are asymmetric and that there is one preferred direction for this asymmetry.

symmetrical in some languages, and it is assumed that no languages with such a symmetrical characteristic have been attested.

However, Kayne (2010) and Haider (2013) seem to agree on the idea that ease of parsing is a criterion of first importance. The difference between their positions is that for Kayne parsing of head-initial structures is easier to interpret *and* to produce. As we saw above, Haider proposes that head-final structures are easier to produce, but head-initial structures are easier to parse.

Takita (2009) has examined the case of Japanese, a head-final language, and argues that Kayne's proposed movement to turn a head-final structure into a head-initial one would produce violations of other rules currently widely accepted and empirically observed, such as the Condition on Extraction Domain.

For the present work, it is necessary to decide which of these two theories is more adequate. In section 5, I will look at an explanation of the Sumerian clause order based on the LCA theory (Niedzielski, 2017) and contrast it with a "true" OV structure according to Haider's BBC.

4.2 VP stacks and shells

In order to explain ditransitive clauses in English (a VO language), Larson (1988) proposed a vP shell, in which at least two verbal nodes or projections (*v*P and VP) must exist to attribute case to direct and indirect objects. For clauses with three or more objects, the shell is made of the appropriate number of verbal projections. The same reasoning applies to causative clauses, where different heads assume the hosting of the "causer" and "causee".

OV structures do not need a special shell to handle several objects, but may require stacks and clusters of verbs, where each verbal projection has the ability to license and assign case to the required number of objects, like in the shells. In OV languages, VP clusters explain also multi-verb constructions like the German sentence in 11) (from Haider, 2013, p. 228):

11) dass er was zu sehen war [gesehen wird haben]$_{cluster}$
that he what to see was seen shall have
"that he shall have seen what was to be seen"

4.3 Syntax trees for head-final clause structures

The CP structure of SOV languages is widely accepted to fit in Rizzi's (1997, 2017) and Cinque's (1999, 2013) hierarchies of Functional Heads. Here is a list (not exhaustive) of projections in their hierarchical order in SVO (adapted from Rizzi and Cinque, 2016; and deMena-Travis, 2010, p. 117):

12) Force-Topic*-Int$_{why,if}$-Topic*-Foc-Topic*-Modification-Topic*-Q$_{embedded}$-Finite-
-[Mood series]-Modal$_{epist}$-Tense$_{time}$-Modal$_{necess}$-Modal$_{poss}$-[Aspect series 1]$_{outer}$
-Modal$_{volit}$-[Aspect series 2] $_{outer}$-Tense$_{anterior}$-[Aspect series 3]-Modal$_{oblig}$-
-[Aspect series 4]$_{outer}$-Voice-[Event-Verb$_{cause}$-[Aspect series 5]$_{inner}$-Verb$_{theme}$-Goal/state

Even when one tries to simplify this list, as I did in 12), its complexity is considerable. For the purpose of this work, I will simplify it further so as to be able to address the word order of Sumerian, without examining the fine details that Rizzi, Cinque and deMena-Travis have studied (Section 5.3).

If we accept that the Sumerian order is verb-final, i.e., SOV or OSV, the most logical path is to reject an SVO syntactic tree similar to the one we use in English.

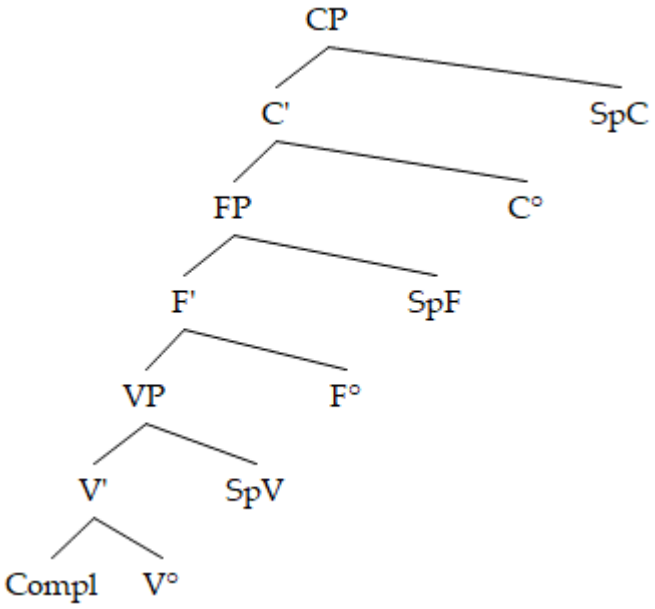
Another material possibility, the flexible word order that can be seen in some Slavic languages, in Latin, and in Yiddish (Haider 2014), is evidently not appropriate for the invariable Sumerian template. However, it is impossible to know whether the Sumerian spoken on the streets and in the privacy of homes had such inflexible structure. Despite this uncertainty, I will not consider a mixed OV-VO model for the Sumerian clause at this point.

If a head initial tree and a flexible word order are discarded, we are left with three possible options:

4.3.1 Option 1: Mirror image of SOV, Heads and Specifiers on the right

Both Kayne and Haider say that this type of structure is to be rejected, because it would mean that the syntactic structure is symmetrical. Also, this type of syntax tree is unattested.

13)



F= Generic functional projection (or a series of several functional projections).

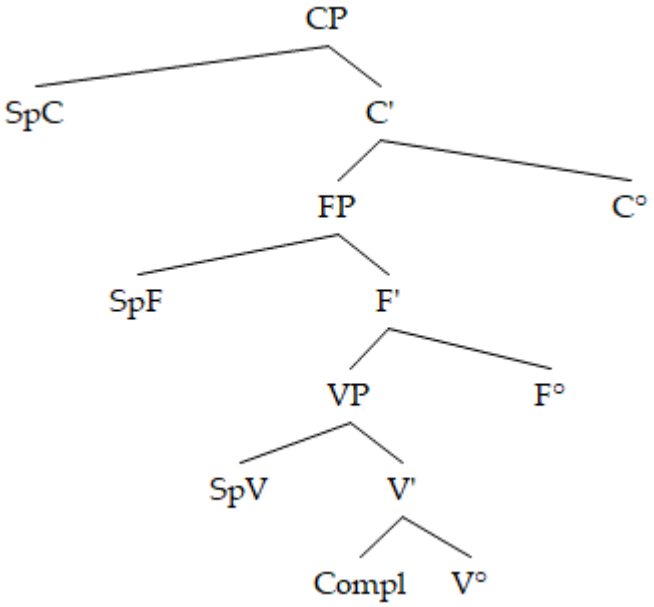
C= The "left periphery" block (right periphery in this case; or a series of projections (See 12) above).

In this template, the Subject and Object would have to be in SpV or SpF (the Specifier of some Functional Head) above the VP. Sumerian, with its Subject on the left of the verbal group, cannot use this template. Also, the Modals and other functional heads would have to linearize after the verb.

4.3.2 Option 2: Specifiers on the left, all Heads on the right

Both Kayne's LCA and Haider's BBC require the Specifier to be on the left side of the spine. The LCA proposes that all heads are also on the left, while the BBC is compatible with all the heads on the right side of the spine:

14)



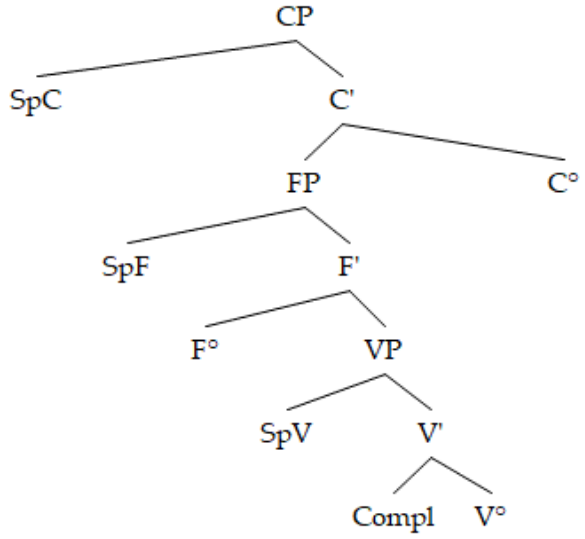
This template allows the Subject to be on the left side of the spine and the complementizer C° at the end of the clause. Consequently, this model could be suitable to describe the Sumerian cartography. But it would linearize the Modals after the verb, if Modals are in F heads. A possible solution to this problem would be to accept that the Negation and Modal morphemes we see in Sumerian in Slots 1 and 2 are occupying Specifier positions of functional heads above the verb.

4.3.3 Option 3: Specifiers on the left, Functional Heads on the left, Lexical Heads on the right

There is a difference between Lexical Heads – always final in OV, always initial in VO –, and canonical Functional Heads (those without lexical content, Emonds (2009)), usually initial in both OV and VO (Haider, 2001).

The Complementizer Head, C°, is head-final in Sumerian, as demonstrated by the invariable appearance of the nominalizer/subordinator morpheme /ʔa/ in Slot 15. Bayer (1999, 2001) has reported clause-final (i.e., head-final) complementizers in several Asian languages, including some cases in which there is a clause-initial *and* a clause-final complementizer. Therefore, assuming a head-final Complementizer for Sumerian at the same time as head-initial canonical Functional Heads is not an *ad-hoc* invention. Extending the principle, we can accept that some of the Functional Heads are "hybrid" (Hageman, 2011) and they can license their complements from right to left, while other "canonical" Functional Heads license their complements from left to right. The theoretical explanation for this difference resides on the fact that "hybrid" heads have some semantic value at the same time as they contain the purely grammatical function (pure functions don't set the truth value of the phrase).

15)



This structure too, Option 3, seems appropriate for our cartographic purpose. The Negation and Modal particles of Slots 1 and 2 would be occupying F heads **or** specifiers on the left-side of the spine.

To summarize, I have rejected Option 1 because it cannot explain the placement of the NP Subject/Object – neither with an EPP feature, nor by accepting that the Subject stays where it is generated (as the Specifier of the verbal head).

I consider Options 2 and 3 to be possible models. But both Kayne's LCA and Haider's BBC are against Functional Heads on the right of the spine. Therefore, the preferred option is Option 3.

At this point, none of the three options above explains easily the fact that the morphemes related to Aspect and Person in Slots 13 and 14, respectively, are post-verbal.

In Section 5, I will propose a way to fit the empirical facts (the 15-slot invariable order in the Sumerian verb complex) in one model.

4.4 Clause structure in modern OV languages

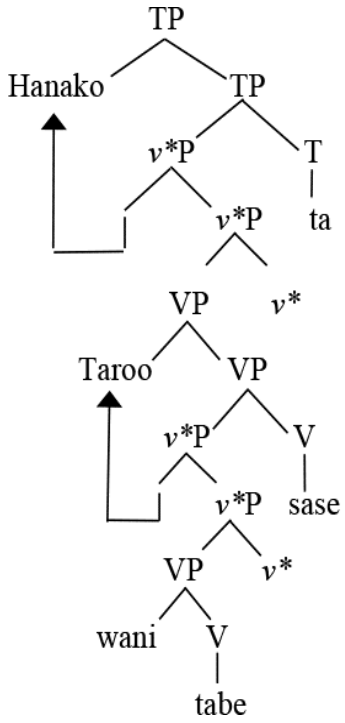
Known natural languages that have an OV structure can help checking the theoretical model that will be selected to describe the Sumerian cartography.

4.4.1 Japanese

The strict head-final structure of Japanese is well established, although there is still some controversy about whether the OV linear order we see is the result of a rearrangement, as proposed by Kayne's LCA, or whether it is the result of direct generation, as proposed by Haider's BBC.

Without attempting to describe the grammar of Japanese (see, amongst others, Higatani et al. (eds), 2017), we can use a generic syntactic tree with the structure from this causative example (Saito 2021):

16) Hanako-ga Taroo-ni wam-o tabe-sase-ta.
Hanako-NOM Taroo-DAT alligator-ACC eat-cause-PAST
'Hanako made Taroo eat alligator meat.'



In Saito's structure, T° is on the right of its complement, as any other head. This corresponds to the structure in Option 2 above. I believe the main reason why Saito chose this structure is the need to account for the morpheme "ta" as a marker of past tense (Saito 2015). Although the upper part of the tree is not seen in the example of 16), in previous work, Saito (2012) established that the Complementizers in Japanese (there are three of them, see also Shlonsky 2015) are clause-final.

Saito (2021), mentioning Fukui (1986), adds that there still is a debate on whether Japanese has a T functional head. This means that a tree with no T can be built, in which there is no need to invoke movement to find a place for the subject **Hanako**, nor for the indirect object **Taroo**. In that case, the morpheme **ta** could be generated right above the *v*P, as an Outer Aspect, or perhaps inside the verb shell, as an Inner Aspect. But neither Saito nor Fukui offer a syntactic tree showing this kind of T-less structure.

Furthermore, a look at the verb inflexions in Japanese (Narrog 2009) shows that Tense is reduced to a past/non-past contrast, which could also be interpreted as an Aspectual contrast:

Inflections on the verb stem		Inflections on the verb base	
-(r)u	non-past	*-Te*	gerund
-(r)eba	conditional I	*-Ta*	past
-(y)oo	hortative	*-Tari*	exemplative
-E/yo/ro	imperative	*-Tara(ba)*	conditional II
-(a)zu	adverbial negation	*-Taroo*	past speculative
-mai	negative hortative	*-tamae*	imperative

Table 7. Verb inflexions in modern Japanese (from Narrog 2009, p.74).

At the end, the syntactic tree of Sumerian does not seem to be similar to the tree in 16) proposed for by Saito for Japanese, mainly because Sumerian does not show evidence of a T functional head.

But the verbal structure in Japanese can help understanding the Sumerian structure. As Sasano and Okumura (2016) show in their study of the word order in Japanese double-object constructions, all six of the following word orders are acceptable:

17)

a) Ken-ga Aya-ni camera-wo miseta.
Ken-NOM Aya-DAT camera-ACC showed

b) Ken-ga camera-wo Aya-ni miseta.
Ken-NOM camera-ACC Aya-DAT showed

c) Aya-ni Ken-ga camera-wo miseta.
Aya-DAT Ken-NOM camera-ACC showed

d) Aya-ni camera-wo Ken-ga miseta.
Aya-DAT camera-ACC Ken-NOM showed

e) Camera-wo Ken-ga Aya-ni miseta.
camera-ACC Ken-NOM Aya-DAT showed

f) Camera-wo Aya-ni Ken-ga miseta.
camera-ACC Aya-DAT Ken-NOM showed

"Ken showed the camera to Aya"

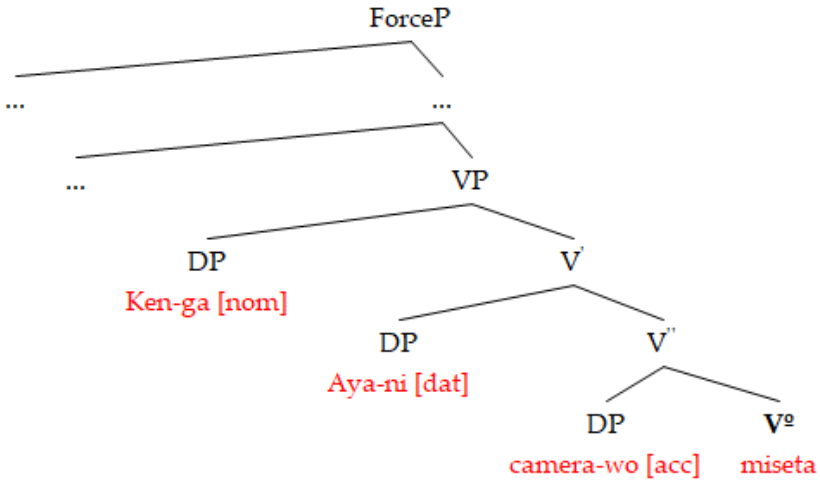
Although Japanese is flexible regarding the order of complements, it has a canonical order for the different objects, which is a) in the example above. Sasano and Okumura propose that the canonical order is determined by the lexical specification of each verb. Some verbs have a canonical order dative-accusative (DAT-ACC), and others verbs have the order ACC-DAT.

In Sumerian, we do not see a change in the hierarchical order and Slots 7 – 10 are always occupied by elements whose cases follow this order:

$_{S7}$DAT – $_{S8}$COM – $_{S9}$ABL or TERM – $_{S10}$LOC

Japanese and Sumerian are different with respect to this hierarchy, but they are similar with regard to the verb's ability to licence several objects in one contiguous line. This licencing is made possible by a strict head-final order in the VP and by the existence of explicit case markers. The schematic tree for the sentence in 17)a:

18)



gives a hint about how the Sumerian verb could position its arguments in the Slots. The great difference between these two languages is that the full DPs in Sumerian are outside the verbal capsule, probably in Topic or Focus positions, and the arguments close to the verb are clitic- or pronoun-like cross-references to these full DPs.

4.4.2 Quechua

Like Sumerian, Quechua is an agglutinative language with SOV order. Although there is some flexibility regarding word order (Hintz, 2003), most scholars of Quechua agree that it has a head-final structure. It must be noted that Quechua is not a single language, but a family of languages, comparable in extent to the Romance languages. All the members of the Quechua family share the main typology, for example the head-final structure and the agglutinativity, as well as a rich case morphology with nominative-accusative alignment.

Regarding the morphology of the verbal domain, Quechua shows a preference for suffixes, opposite to the Sumerian preference for prefixes.

The verbal domain in Quechua is very complex. Camacho Rios (2022) identifies four types of affixes (suffixes and prefixes/clitics):

- Lexeme Building Suffixes (non-inflectional productive suffixes),
- Non-Obligatory Inflectional Suffixes,
- Obligatory Inflectional Suffixes,
- Enclitics

The Lexical Verb Base, comparable to the Sumerian verb base, derives a verb Stem by combining the base with two types of Lexeme Building Suffixes, *simplex* and *complex*.

Camacho Rios (2022) describes this derivation as follows:

> "*The verb stem in UPSBQ* [Uma Piwra[27] Southern Bolivian Quechua] *exhibits two types of non-inflectional suffixes: simplex and complex. The number of suffixes that form a more complex stem range from one suffix up to four suffixes as mentioned earlier. A stem can be derived by one non-inflectional suffix, a two-suffix string, a three-suffix string, or four-suffix strings*".

In this view, *simplex* suffixes are monomorphemic, while *complex* suffixes are multi-morpheme sets that are supposed to have evolved diachronically from the merging of two or more simpler suffixes.

The *simplex* suffixes appear in systematic slots, in a way similar to the slots of Sumerian (but as suffixes, not as prefixes). Between Slot 1 and Slot 2, there is a space that Camacho Ríos calls "zone", in which one or more adverbial suffixes can be combined with no specific order:

19)

slot 1	Perfective aspect	-yu, -yku	'to do V, with an emphasis on the finished result of the action'
zone	Nimbly	-rqu2	'to do V nimbly'
	Suddenly	-rpa	'do V suddenly'
	Argument associated (Valency increasing)	-ysi	'X helps Y (Subject LVB) to do(transitive/intransitive)'
slot 2	Sentiment/ emotional/desire	-ri	'for V to be performed softly, gently, politely, pleasantly'
slot 3	Argument associated (Valencyincreasing)	-chi	'X' causes/makes 'Y' to do V'
slot 4	Reflexive	-ku	'do V for oneself'
	Associated motion	-mu	'for subject to do V moving from X point towards Y point' 'for subject to go to an X place and do V'
	Argument associated (Valency increasing)	-pu	'to V on behalf of someone at a specific location' (transitive verbs) 'to V back to origin' (verbs describing a path) 'to complete V for good' (verbs having an end-point)

Table 8. Verbal components in Uma Piwra Quechua (Camacho Rios 2022, p. 19).

The causative suffix -**chi** appears in Slot 3 in a way that reminds of the causative construction in Sumerian (see example 36) on page 78). The main difference is that in Sumerian the

[27] Uma Piwra is the name of the village where Camacho Rios was born and later conducted her research.

causative is obtained through the simple addition of a cross-reference to a *causer* participating in the event, while in Quechua **-chi** designates a *cause* event that adds to a *caused* event, with no direct cross-reference to the *causer*. A reference to the *beneficiary* is carried by another suffix, as in example 20):

20) yaku-ta chura-chi-pu-nku ni-nku (Camacho Ríos 2020, p. 58)
water-ACC install-CAUS-BEN-3PL say-3PL
"They say they made (someone=CAUS) install water on (someone's=BEN) behalf."
CAUS=causative, BEN=beneficiary

There are six types of causativity in Quechua: 1) Indirect, 2) Sociative, 3) Partial, 4) Neutral, 5) Self-causation and 6) External (caused by a natural phenomenon). Not all verbs can select all these six types. For example, only weather verbs can be used in Type 6 causation, and only state change verbs can be used in Type 3. A detailed account of these subtleties of Quechuan causativity is offered by Camacho Ríos (2022).

Complex suffixes do not have a specific slot to fit in. Camacho Ríos proposed that they be treated as constituents of the phrase rather than as components of the verb morphology.

Another big difference between Quechua and Sumerian is that the former has an elaborate Tense system. While in other OV languages, like in Sumerian, Tense is often tightly entangled with Aspect, Quechua has developed clearly separated Tense and Mood/Modal Functional Heads that result in easily identifiable Tense and Mood/Modal inflexions.

Relative/embedded clauses in Quechua are built by means of a subordinator/nominalizer. Compare the Sumerian 3) from page 20, repeated here as 21):

21)
$^{a\text{-}šag_4}$ašag tum$_3$-de$_3$, am$_6$-ta-bala-e-da
ašag=ø tum-ed=e $_{S2}$a-$_{S4}$m-$_{S5}$b-$_{S9}$ta-$_{S10}$e-$_{S12}$bala-$_{S13}$ed-$_{S14}$ø-$_{S15}$**'a**
field=ABS *bring*-PF=DAT.NH FIN-VEN-3.SG.NH-ABL-L2-*cross*-PF-3.SG.S-**SUB**
"who crosses (the boundary levees) to take away fields"

to the Quechuan relative in 22) (Lefebvre and Muysken, 1998):

22)
uña-n-kuna-ta amacha-**q** puma-ka.
cub-3SG-PL-ACC protect-**SUB** puma-TOP (TOP=topic marker[28])
"the puma who protects its cubs"

Both Jagersma (2010) and Zólyomi (2017) mention only one type of nominalizer for Sumerian, while in Quechua there are three types (Lefebvre and Muysken, 1988, p. 167):

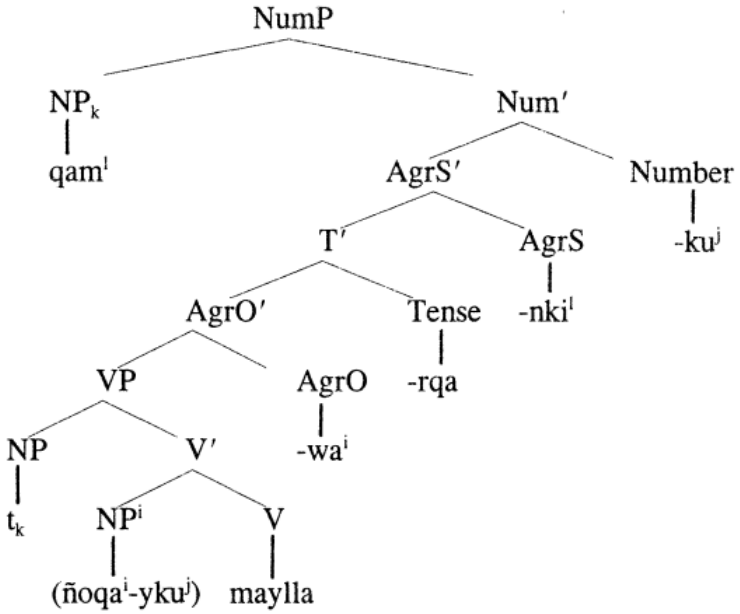
-q: subject relativized, no person marker
-sqa: non-subject relativized, action realized, person marker
-na: non-subject relativized, action unrealized, person marker

Nominalized clauses in Quechua can be inflected and case-assigned, in a quite complex pattern whose explanation goes beyond the purpose of this work. A factor that needs to be considered here is the fact that the agentive nominalizer **-q** is morphologically identical to other clause type markers (past habituals, purposives, perception complements) and such syncretism is often the source of confusion in the analysis of relativization.

[28] Note that the topicalized subject has been placed at the end of the clause, i.e., in the "right periphery".

Quechua is also known for its robust subject agreement system (Person and Number). Van de Kerke (1996) puts the subject agreement at the top of the middle field, in the Cuzco Quechua variant:

23) (ñoqayku -ta) (qam) maylla -wa -rqa -nki -ku
(1PL-ACC) you wash -1OBJ-PST- 2SG - PL
"You washed us".



Without further exploration of the Quechuan grammar and syntax, we have sufficient material to see that, despite a common OV order/head-final structure and some similarities in terms of Slot organization of the verb word, Quechuan cartography cannot help us understanding the cartography of Sumerian. To start, the fact that the Quechuan verb word is built through suffixation makes it too different from the prefix-based Sumerian verb.

4.4.3 Navajo

Navajo is another agglutinative language that shares features with Quechua and Sumerian. It has OV/head-final structure, its verb complex is organized in Slots and it shows ergative-absolutive case alignment, which makes it interesting for comparison with Sumerian.

Navajo belongs to a large family of North American indigenous languages, the Athabaskan (Hale, 2000). Together with other American indigenous languages, it is considered an archetype example of polysynthetic languages and has served as an illustration of incorporation[29] in morpho-syntax (Baker, 1985).

Strikingly, Navajo has a prefix-oriented verb morphology that is roughly a mirror image of Quechua (Courtney and Saville-Troike, 2002). But at this point there have been no further explorations to find a deeper parallelism in terms of cartography.

The Navajo verb is organized in three zones, linearized from left to right as:

Disjunct prefixes – Conjunct prefixes – Stem

[29] Verbal incorporation is now interpreted through Applicatives (Jeong 2007).

The difference between the Disjunct and Conjunct prefixes has been set by scholars of Navajo based on phonological behaviour (see for example Young, R.W., 2000).

The Slot table for Sumerian (Table *4*, p. 19) can be compared to this Navajo summary of slot content:

	Slot Number	Function
Disjunct prefixes	0	postposition object
	1a	"null postposition"
	1b	adverbial-thematic
	2	iterative
	3	plural
Conjunct prefixes	4	direct object
	5	deictic
	6	adverbial-
	7	mode-aspect
	8	subject
	9	classifier
Stem	10	stem

Table 9. Navajo verbal morphology slots and their function (Young, R.W., 2000*).*

It seems that the syntactic positions of Navajo Conjunct prefixes have some common ground with the Sumerian prefixes in Slots 5-11, which cross reference verb arguments. However, the order is different and also the fact that the notions of Agent and Patient are less clear in the Navajo slots, despite the fact that Navajo is an ergative case language.

Although this doesn't seem to affect the structure, Sumerian lacks a Classifier system, while Navajo has a rich one integrated into its verb morphology (Slot 9).

Hale (2001), trying to find a syntactic explanation to the Navajo phrase, could not establish a straight forward correspondence between the theoretical, generative grammar-inspired, syntactic tree and the linear order in what he calls the "surface form". Many of these difficulties are due to metathesis of some template elements, which is claimed to be motivated by phonological reasons. This characteristic makes Navajo even more different from Sumerian.

5 A cartographic view of Sumerian

5.1 Previous work

5.1.1 Niedzielski's VO hypothesis

Niedzielski (2017) analyses the Sumerian clause in its entirety and considers several options to explain its structure.

He starts from a head-final configuration and tries to explain the fact that the stem in affirmative imperatives appears at the beginning of the verb phrase, in Slot 1:

24)

é-gal-šè	la-ḫa-ab	(Jagersma 2010, p. 557)
é.gal=šè	laḫ$_5$ -ʔa-b	
house.big=TERM	$_{S1}$bring.PL- $_{S2}$VocP -$_{S11}$3SG.NH.P	
"Bring them to the palace!"[30]		

He tries to explain this imperative structure through head movement in an OV scheme. Since the argument NP (*the palace*) is still in a preverbal position, it looks like the movement has taken place only inside the verbal domain, from Slot 12 to Slot 1. But there is no motivation known for this intra-verbal movement. Therefore, the stem must move to a higher head, possibly one with an imperative feature in the preverbal space, and on the left side of the spine. For this to work, Subject and Object NP's must move up too, otherwise they would appear after the verb in imperatives.

A movement from V to C can be considered at this point. Niedzielski identifies two problems with this hypothesis:

First, a movement from V to C without stopping at T or other intermediate heads violates the Head Movement Constraint. If V moves to T, the ordering of morphemes in imperatives is not correct. Niedzielski does not consider the possibility that there is no T head, and therefore must invoke a *long head movement (LHM)*, of the kind proposed by Rivero (1991) for negation structures in Slavic[31], i.e., movement to C without stopping at T.

Second, a head-final tree would have C° on the right, and – if this movement happened – the imperative stem would have to appear after the other slots.

Facing these difficulties, Niedzielski proposes that C° in Sumerian must be on the left side of the spine. In that case, LHM can explain the imperative structure by moving the verb stem from Slot 12 to C° or a similar position high up in the structure.

[30] Note that the "Vocalic Prefix" VocP used in imperatives is homomorphous with the subordinator suffix /-ʔa/. However, this is a simple coincidence, as shown by the fact that Slot 2 can be filled by similar morphemes (called finite-marker by Zólyomi 2017, p. 146) such as the non-imperatives /-ʔi/ or /-ʔu/ (see also Jagersma 2010, p. 553).

[31] Long head movement is controversial (see for example Caink 1999).

But even with a C° on the left, head movement cannot explain the slot structure and in particular the fact that negative imperatives do not show verb stem movement. To overcome these difficulties, Niedzielski makes a reasoning that enables him to propose that:

1. C must be head-initial to explain the imperative.
2. The formation of the verbal complex must not occur before movement of V° to C°, since the imperative leaves the slot prefixes in a lower position.
3. The argument NPs (Niedzielski calls them *free nominals*) must move up to positions above C, to the left periphery proposed by Rizzi (1997).
4. As a corollary, if all the above happens, then Sumerian is in fact head-initial and the seemingly head-final structure is due to movement of the entire VP to CP, together with the arguments/*free nominals*.

In Niedzielski's (2017) words:

> "*I propose that the verbal complex is simply a spell out of the clause. The C^{o} is included in this spell out, as in imperatives, and the complement of the CP is the remainder of the verbal complex.*
>
> *This can be stated formally as:*
>
> Sumerian Clausal Polysynthesis Constraint*:*
> *The C' constituent must be realized as a single phonological word.*
>
> *This simple statement derives the templatic nature of the verbal complex, as the morphological structure is essentially the same as the syntactic structure of the C'. Just as interestingly, it derives the movement of free nominals out of the C' into positions in the left periphery, as if they were to remain* in situ*, the C' would be unable to form a single phonological word. In this way, the free nominals must move to high A' positions, movements which can result in any surface order*."

5.1.2 The internal structure of the Sumerian VP

The Sumerian verb word or complex distinguishes itself by the rigid affix and stem template, organized in 15 slots.

The first three slots contain grammatical information that is clearly outside the strict verbal domain: modals, finite marker and coordination.

Slot 4 carries the *ventive* prefix, which is firmly attached to the verbal domain but doesn't seem to be completely inside it.

Inside the VP, in a clitic-like configuration, Slot 5 can be occupied by a marker of the middle voice, **-ba**, or by a morpheme containing person, gender and number information relative to the first prefix that appears in the range 7-10, if this prefix cross-references a non-human object. If the first prefix in the range 7-10 cross-references a human object, then the information about its person, number and gender is in Slot 6[32].

[32] The Slot description to which I refer here is Zólyomi's (2017). In other slot descriptions – for example Jagersma's (2010) or Attinger's "Tableau grammatical du sumérien (problèmes choisis)" (2019) – Slot 5 is reserved to the voice marker, while the person, number and gender information is in slot 6, both for human and non-human indirect objects.

These four slots in the range 7-10 are filled or left empty according to the needs of each particular clause; sumerologists have called them the *Dimensionalkassussystem (DKS)*.

Niedzielski explores this DKS and concludes that it cannot be accounted for in simple terms of agreement, nor coreference, nor incorporation. He suggests that the DKS is a system of applicatives, based on Pylkkänen's (2002) observation that verb arguments come in two types: "*those that are true arguments of the verb and those that are "additional" in the sense that there is evidence that they do not belong to the basic argument structure of the verb*."

This observation fits well into the Sumerian system. There is a set of preverbal *free nominal* groups, Subject and Object(s), which carry case markers and the end of the block (see Section 2.2 on page 17). And there is the DKS, which is inside the VP and whose members refer to the arguments and carry explicit Case information, too.

The following example shows Niedzielski's understanding of how the applicative heads introduce arguments and assign inherent case to them:

25)

PN dub-sar-da ba-da-lá (Jagersma 2010, p. 449)
PN dub.sar=da Ø-ba-n-da-lá-Ø
PN scribe=DAT $_{S4}$FIN-$_{S5}$MID-$_{S6}$3SG.H-$_{S8}$COM-be.short-$_{S14}$3SG.NH.P
"This was short with PN, the scribe"
(perhaps in the sense *"This accused/denounced PN, the scribe"*)

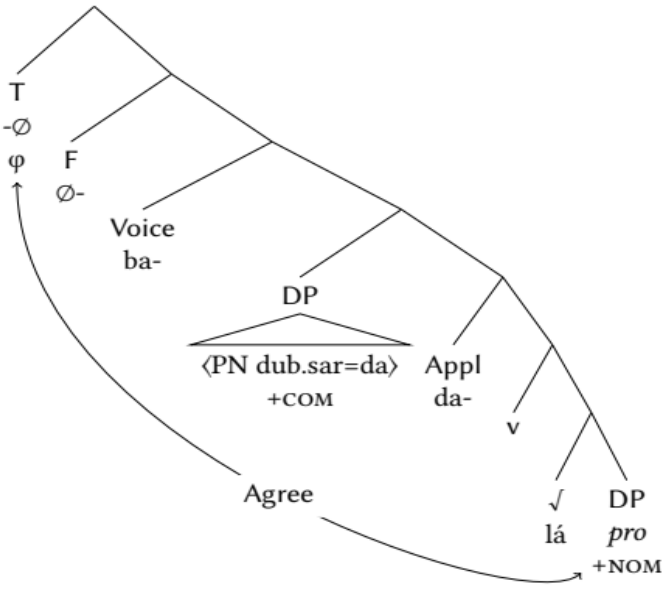


Figure 12. Applicative analysis (Niedzielski 2017, p. 45). Note the hypothetical T head.

Applicative functions using a fixed argument hierarchy and attributing case are known in other languages. Applicative affixes are elements which take an event as their argument and introduce an individual which is thematically related to that event (Pylkkännen 2002; Petersen 2007; Jeong 2007).

High applicatives attach above the verb and low applicatives below it (as discussed in section 3.5 on p. 41).

5.1.3 Comments on the VO hypothesis

Niedzielski's proposal is able to reflect the linear order we see in Sumerian, but there are a few points that require discussion.

5.1.3.1 On the existence of TP

As seen in previous pages, there is no evidence of a Tense function in Sumerian, as in many other languages.

One of the first difficulties encountered by Niedzielski's is the need to explain the fact that a suffix called "present-future marker", **-/ed/**, appears after the verb stem, in Slot 13. Accordingly, he felt it necessary to postulate a Tense function above the VP; and that decision prevents invoking standard head movement to explain imperatives.

A Tense Functional Head is not needed in Sumerian. Using a Minimalist approach, one can explain the syntax of Sumerian without TP.

But then, if there is no TP, the **-/ed/** suffix must be explained by other means. Based on deMena-Travis (2010) and other similar analyses, it is possible to justify the **-/ed/** suffix as part of the internal morphology of the verb (Inner Aspect), in this case a morpheme carrying the *marû* (imperfective) aspect that attaches directly to the stem of Class 3 verbs.

5.1.3.2 On the Sumerian Clausal Polysynthesis Constraint

This constraint is *ad hoc*. As far as I can see in literature searches, there are no examples of similar constraints in other languages. This constraint is not explained by incorporation phenomena in the Athabaskan style (Baker 1988) nor is it related to other theories or cases of verb movement to the periphery. Despite its explanatory ability, there are no reasons to believe it. It is axiomatic like a principle but if it exists it can be only a parameter. There is no principle-based theory to support it.

5.1.3.3 On a head-initial CP

A head-initial CP cannot explain the structure of subordination in Sumerian. As seen in Sections 4.3.3 and 4.4.1, a head-final CP is appropriate to explain the position of subordinators/complementizers at the end of the clause in Sumerian, in Japanese and in many other languages.

5.1.3.4 On the motivation of V to C movement

There is no stated or proposed motivation for the movement of the verb word from V to C. Niedzielski's hypothesis uses Kayne's LCA theory about a universal SVO order that can be transformed into an apparent SOV order through movement. Until now, there has been no principle-based proposals for the motivation of such additional processing in the brain, nor for a trigger to start the transformation into SVO after the SOV stage is completed.

5.1.3.5 Alternative to head-initial CP

Aware of at least some of the difficulties I just listed, Niedzielski himself, in a footnote of his dissertation, considers that "*the Sumerian data can be accounted for without forcing a left-headed CP by assuming that the verbal stem moves into a specifier position, and then undergoes morphological merger with the rest of the verbal complex. Because this specifier position will always precede the complement, which houses the rest of the functional material in the verbal complex, there is no need to assume CP is left-headed*."

This alternative approach is based on the work of Preminger (2019, from his 2017 dissertation) and proposes that what moves up first is the VP remnant (the prefixes), motivated by agreement features.

Although this new interpretation has the potential to explain the Sumerian linear order, it still remains unclear with regard to the movement's motivation and trigger. Similarly, the motivation for the "morphological merger" that would reunite the prefixes with the verb stem after its movement to the Specifier of C is not explained.

5.1.3.6 On the clitic character of Slot 6 and the applicative explanation of Slots 7 to 10

Although Niedzielski's example in Figure 12 shows a head-initial structure (in my opinion inappropriate for Sumerian), his explanation of the presence of case-marked prefixes in Slots 6 (the Initial Pronominal Prefix, IPP) and Slots 7-10 is perfectly acceptable. The IPP is most likely a clitic attached to the morpheme in the next slot with a mechanism similar to what we see with the French clitics (see example 4) on page 21). And high applicatives above the verb stem explain Slots 7-10 in a simple and principle-based way.

5.2 Principles for the elaboration of a syntax template for Sumerian

Considering what was discussed in the previous sections, there is need to adopt a set of criteria that will enable the selection of a syntactic structure. The selected structure must be anchored on a few theoretically sound principles and be clear about the motivation of the choices proposed, avoiding *ad hoc* solutions and theoretical complications. At the end, it must be able to explain the linear order of the Sumerian verb phrase, in particular the 15-slot fixed order.

Based on various proposals by multiple authors: Chomsky (1993), (Kayne (1994), Brody (1995), Haider (1997), Pylkännen (2002), van Hout (2000b), Ura (2000, 2006), Cinque (2013), Emonds (2013), deMena-Travis (2017), Den Dikken (2018), and many others, I adopt the following rules for the choice of a structure template:

Building principle:

I. *Merge*
   a) The fundamental combinatorial operation of human language is the *merger* of two elements (binary character) to create a new block.
   b) *Merge* is recursive: a new block can undergo further fusion with another block or single element.
   c) The result of a *merge* operation is a set with no predetermined order.

Heuristic rules:

II. Antisymmetry
   a) Natural languages create syntactic structures that grow to the right (*right branching)* when seen from the topmost position, the Root of the clause.
   b) As a consequence of *right branching*, the entire structure has asymmetric c-command.

III. Selection, Heads and Word Order
   a) In a *merged* projection, the component that has the most powerful specification *selects* the component with which it merges. It is called the *head*.
   b) Heads can be lexical or functional.

- Lexical heads determine truth value. Each language chooses (parametrizes) whether the lexical heads are initial (on the left side) or final (on the right side) in the merge operation.
- Functional Heads modify the scenario in which the predication takes place (spatial, temporal or other dimensions like: hypothetical, modal, emotional, etc.).

c) Functional Heads can be "exclusively grammatical" or "hybrid".
- Exclusively grammatical Functional Heads are on the left side of the spine.
- Some hybrid heads act as Lexical Heads and can be on the right side of the spine (head-final).

IV. Lexical specification

a) Each component in a language structure has a lexical specification that defines its semantic possibilities and/or its grammatical function.

b) The lexical specification of a verb includes:
- Aspect, visible through morphology or else A*ktionsart*.
- Valency and hierarchy of arguments.

V. Aspect

There are two manifestations of aspect:

a) Lexical or inner aspect, which is determined by the verb's inherent lexical specification. Inner aspect encompasses the concept of *Aktionsart*.

b) Grammatical or outer aspect, which is a function located outside the verb's domain so as to have scope over all the events involved.

VI. Applicatives

a) High Applicatives modify the lexical specification of verbs, so that they select phrases as arguments, thus modifying the relations the verb has with its arguments.

b) Low Applicatives modify the relations between two arguments.

5.3 "Standard" head-final template for Sumerian cartography

5.3.1 The hierarchy of grammatical functions in the Sumerian clause

Judging from the available corpus of the "classical period", the Sumerian clause is formed by a sequence of two main parts, one nominal and the other verbal.

The first part, which is not examined in detail in this work, contains the explicit Subject and Object(s). A particular characteristic of this first group is the fact that it can form a complex set made by combining the subject and the objects in a chain that is case-marked at the end. The syntactic structure and complexity of this nominal group is illustrated in Figure 13 (page 64). For a complete explanation of this type of structure, see Jagersma (2010) and Zólyomi (2017).

The second part is the verbal domain. In Sumerian, this domain is a "capsule" in which the components are placed in 15 slots that follow an invariable order, shown in Table *4* (page 19). The first slots, 1 and 2, accommodate modal modifiers. Slot number 3 is reserved for a coordination morpheme. Following a proposal by Woods (2008), Slots 4 and 5 contain morphemes that define the Voice of the clause and the perspective of the predication, i.e., whether the action or event is about some benefit or consequence for the subject or whether it is about the object or location. Slot 5 can also contain a morpheme that refers to the person, number and gender of the first morpheme located in slots 7-10, if it is a non-Human entity. This information appears in slot 6 if the first occupied slot in the range 7-10 refers to a Human entity.

Slots 7-10 contain cross references to the nominal entities of the first part of the clause (the nominal part), including in the case in which the first part may have been elided due to pragmatic discourse needs. These morphemes are case marked according to the roles of the nominal phrases they cross-reference.

Slot 11 contains information about the Agent in transitive constructions. Slot 14 contains a kind of verbal inflexion related to the Subject of intransitive situations or to the Object of transitive verbs. The type of information that appears in these slots depends on the Aspect and is part of the split ergativity mechanism (section 3.4.2).

Slots 12 contains the lexical core of the verb, and slot 13 an internal Aspect specification marker in cases in which the verb theme does not contain this specification explicitly.

Finally, slot 15 contains a complementizer morpheme that acts as a nominalizer or relativizer.

Table 10. Modified Slot organization of the Sumerian verbal template.

Slot 1a Slot 1b	Negative prefix **nu**- Epistemic modal **ha**-, prefix of anteriority
Slot 2	Other modal prefixes (deontic, etc.) **ga-**, the finite-marker prefixes
Slot 3	Coordinator prefix
 Slot 4 Slot 5	***Voice system:*** Perspective prefix **mu-** (*ventive*), and its variants **im-**, **imma-**, etc. Middle voice prefix **ba-**
  Slot 5 Slot 6	***Clitic prefix*** *(specifying the person, gender and number of the first appearing in the sequence of dimensional prefixes):* Third person, non-human pronominal prefix **b-** or Initial Pronominal Prefix (third person, human) **n-**
Slot 7	Dimensional I: dative prefix
Slot 8	Dimensional II: comitative prefix
Slot 9	Dimensional III: ablative or terminative prefix
Slot 10	Dimensional IV: locative1, locative2, or locative3 prefix
Slot 11	Final Pronominal prefix (referring to **A** or **P**, depending on the aspect)
Slot 12	Stem

Slot 13	Aspect specification marker (only for intransitive verbs of Class 3)
Slot 14	Pronominal suffix (referring to **A**, **S**, or **P** depending on the aspect)
Slot 15	Subordinator (also called "nominalizer")
A = Agent, **P** = Patient, **S** = Subject	

The current accepted view of the nature of these slots is the result of a philologist view oriented towards the practical use for translation (see the original Table *4* on p. 19); it might benefit from a slight modification for more clarity in view of a linguistic approach.

Slot 1 should be split into two slots: one for the negation function and a second for the epistemic modal.

Similarly, locating two grammatically very different prefixes in Slot 5 (the Middle prefix **ba-** on one hand and the third person non-human clitic **b-** on the other) is not adequate in terms of linguistic structure. The diathesis-related contents of slots 4 and 5 could be combined into a single slot for Voice marking, and the agreement elements of slots 5 and 6 into another single slot dedicated to the clitic marking of person, number and gender of the entity referenced in the next occupied slot, whether Human or Non-Human.

However, since the two most important corpuses of Sumerian, the ETCSRI[33] and the ETSCL[34], use the 15-slot system, I believe it is convenient to keep it as the reference.

Based on the order shown in the table of slots (Table 10), one can conceive a hierarchical chain of grammatical elements, in the spirit of Rizzi and Cinque (2016):

26)

[Force/CP] – [Topic] – [Focus] – [Topic] – [Neg] – [$Modal_{epist}$] – [Fin?] – [$Modal_{deont,dyn,\ etc.}$] – [Coordinator] – [Voice] – [Verbal chain]

The Topic and Focus nodes are proposed in order to provide a space for the explicit Subject and Object Nominal Groups, which are located at the very beginning of the clause.

There is some incongruity in the location of the Coordinator after the Modal nodes; and the true identity of the finite marker is uncertain. But this hierarchy fits with the empirical data.

Note that, since Sumerian is an OV language, the heads of lexical nodes will be in final positions, while functional heads will be on the left side. Hybrid heads can be on either side; this could be the case of the Neg head, which is at first sight lexical but which also has scope over the whole predication – a strong sign of a functional nature. For simplicity, I consider that NegP has a hybrid head that can stand on the left side.

The fine structure of the Verbal Chain can also be deducted from the Slot system:

27)

Event – [ApplDAT] – [ApplCOM] – [ApplABL/TERM] – [ApplLOC] – [VP [InnerAsp] [V°]]

This structure relies on the existence of High Applicatives (Niedzielski 2017, Pylkkänen 2002), whose effect is to extend the valency of the verb Stem in a way that enables an agreement cross-reference with the respective elements of the Nominal Groups containing the Object(s).

[33] https://oracc.museum.upenn.edu/etcsri/corpus
[34] https://etcsl.orinst.ox.ac.uk/#

The node of the first visible Applicative (Slots 7 to 10) has an explicit Specifier containing a clitic morpheme that agrees with the person, number and gender of the element cross-referenced by the Applicative, in a way similar to the Romance clitics (see example 4), page 21).

Finally, the verb phrase itself can have a traditional structure with a cross-reference (a kind of a pronoun) to an argument in slot 11 for transitive verbs, while a cross-reference to another argument is in slot 14; in Sumerian, the full DP verb arguments are always outside the verbal capsule, most likely in Topic or Focus positions, and therefore slots 11 and 14 contain only pronoun-like references to the Nominal Groups.

Slot 13 is reserved for the Lexical Aspect marker of verbs of Class 3, as explained before.

The complementizer that appears in slot 15 is adjoined to the node at the very top of the clause, as in Japanese and other classical head final languages.

5.4 The syntactic tree

5.4.1 Noun phrase structure

Although the analysis of the noun phrase is not part of the objectives of this work, it can be helpful to show here a small illustration of what has been done elsewhere in this respect. For example, a tree diagram of the phrase in 28) has been proposed by Zólyomi (2005):

28) ama dumu zid lugal-ene-ra

$_{P1}$ama $_{P3}$[$_{P1}$dumu $_{P2}$zid $_{P3}$[$_{P1}$lugal=$_{P5}$ak]=$_{P4}$ene=$_{P5}$ak]=$_{P5}$ra

mother son true king=GEN=PL=GEN=DAT.H

"for the mother of the king's true sons"

(Note that the genitive "ak" does not appear in the transliteration of the first line, because of phonotactics. But it is recovered in the morphemic analysis; otherwise, the phrase would not make sense).

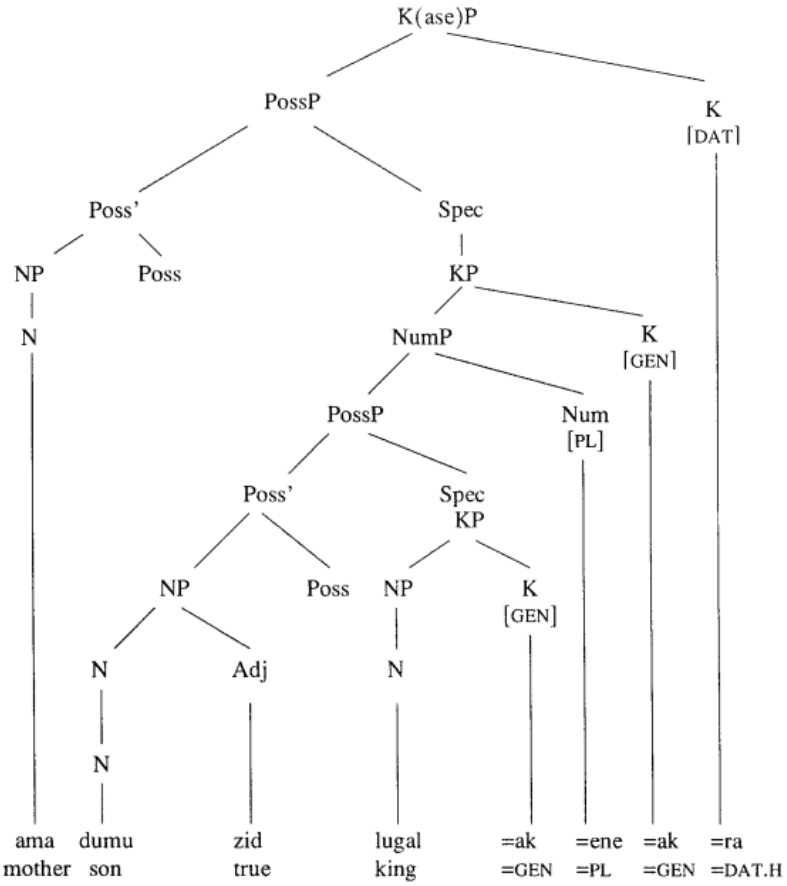


Figure 13. Tree diagram of the dative noun phrase (Zólyomi 2005, p. 165).

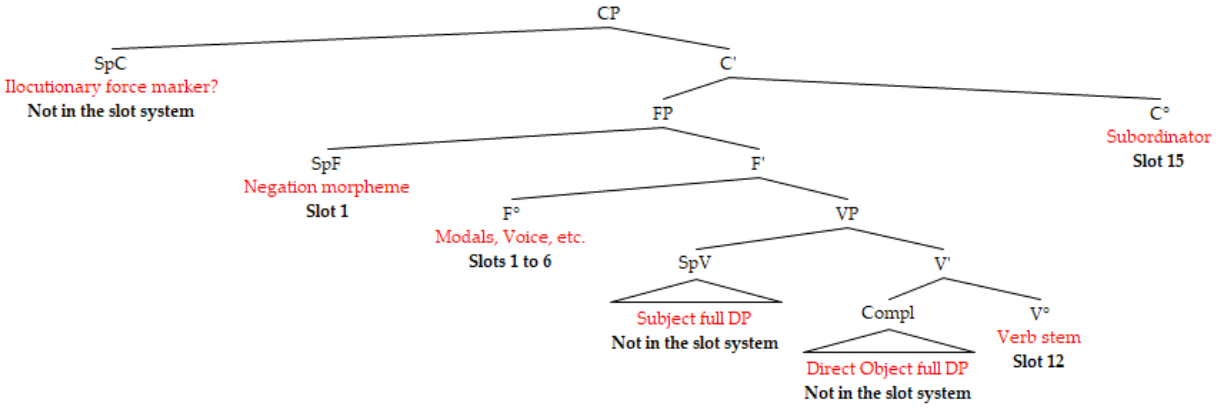
In Figure 13, the nominal group is a head-final dative phrase (K(ase)P in Zólyomi's nomenclature), and its main head is the human dative morpheme "ra". Its complement is a possessive phrase PossP whose Specifier is occupied by a complex subtree that starts with an embedded second KaseP. The three NPs involved, "ama", "dumu" and "lugal" are complements of Possessive or Case heads.

While this tree is adequate to understand the structure of the nominal domain, there is a problem with the directionality of merge. Zólyomi assumes that a head-final syntactic tree is a mirror image of a head-initial tree. But both Kayne (1994) and Haider (1997) claim that natural languages do not do "left branching": a merge sequence – even when the head is on the right side of the merged pair (head final) –, will always have the Specifier on the left of the intermediate projection; in other words, it will do "right branching" and grow to the right (see footnote 20 on p. 26). Therefore, "grafting" the maximal projection of KP (a Functional Node) to a Specifier position on the right side of the dominant Functional Head, as in Figure 3, is not supported by a principled reasoning. A revision of the labels in Figure 3 might be necessary to describe the structure in a way more consistent with basic principles.

5.4.2 Clause structure

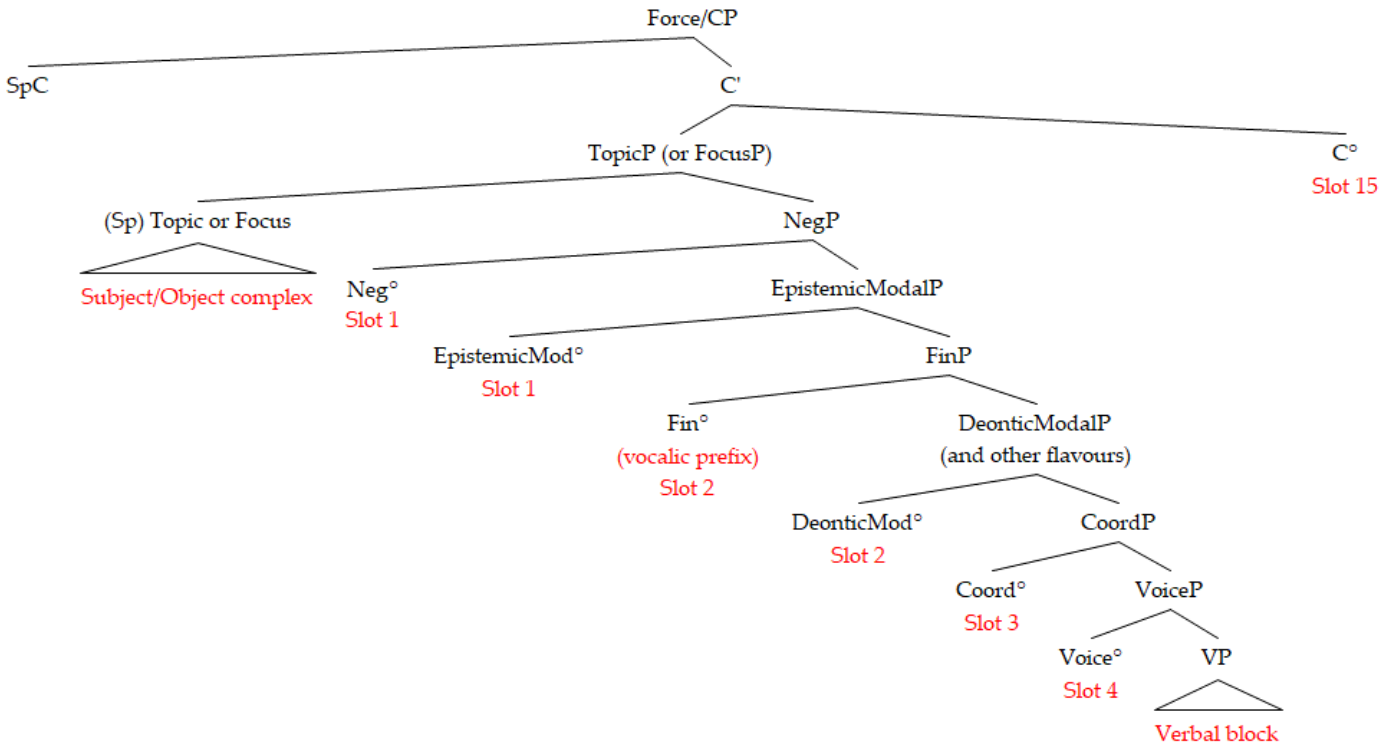
In the most commonly admitted syntax of the verbal domain, the subject and object are local arguments of the verb. For the OV ordered Sumerian, we could expect this overall configuration, using the preferred syntactic tree model (Option 3 in Section 4.3.3, p. 46):

29)



Because the full DPs of the Subject and Direct Object do not appear inside the verb capsule (the Slot System), I argue that these full DPs are expressed as Topics or Focus items, high in the structure. Since the Subject/Object group is a complex element, it cannot be the head of the Topic or Focus node. Therefore, it must be adjoined to the three as a Specifier, on the left side of the spine:

30)



The fundamental principle applied here is the right-branching universal proposed by both the LCA (Kayne 1988) and the BBC (Haider 1993). The tree grows to the right starting from the root, Force/CP.

The structure in 30) is adequate to explain the fact that Subject and Object always appear ahead of the verbal block. This proposal is not a new invention, since other languages are known to systematically place the Subject and/or Object in Topic or Focus positions (Neeleman et al. 2009). It is understood that there may be several kinds of Topics and Focus, and therefore there are many possible positions for them in the clause. We may also note that, although Topic and especially Focus constructions are often contrastive, these categories can also fulfil other discourse pragmatic needs without contrast (like Focus/Topic fronting or scrambling). For the cartography of Sumerian, at this point, what matters is that these full DPs are not inside the verbal block.

5.4.3 Functional Heads

Functional heads that do not determine the truth value are placed on the left side of the spine, as are possible Specifiers. This is the case of the Negation, Modality, Finiteness and Coordination prefixes as well as the Voice function.

5.4.3.1 Negation and Modality

It is widely accepted that modality is located in Functional Heads above the VP. In Sumerian, we see modal prefixes at the beginning of the verbal complex. From a cartographic point of view, modality is in the "middle field", above the verb nodes and below the higher functions of the "left periphery".

According to Zólyomi (2017, p. 240), Slots 1 and 2 are occupied by Negation and/or Modality prefixes.

Since the negation morpheme **/nu/** is in Slot 1, it could be either the head of a hybrid Functional Negation Head or the Specifier/adverb of a Lexical Negation Head, as happens in many other languages (see for example Cinque 1999). For simplicity, I propose to consider the Negation morpheme as a Functional Head in this work, without discarding the possibility that Negation be a Lexical Head.

The epistemic modals are also attributed to Slot 1, although it is obvious that they have their own functional node, different from the Negation node and immediately below it. Accordingly, it would be better to say that there are two slots instead of only one: Slot 1a for the negation morpheme and Slot 1b for the epistemic modal morpheme.

Slot 2 is occupied by the deontic and other non-epistemic modals. The deontic node houses the verbal stem in affirmative imperative clauses. Hortative and negative imperatives put the verb stem at the usual place, in Slot 12. See the example in Section 5.6.7 below.

The Modal prefix **ḫa** is always in Slot 1, as is the Negation prefix **nu**. Other modal prefixes (**ga**, **bara**, **na(n)**) are in Slot 2. The prefix **ga** is always deontic, while **ḫa** is usually epistemic, but can also be found in some deontic cases[35].

[35] Many languages use the same verb or adverb as either epistemic or deontic modal, for example French *pouvoir* and *devoir*.

Negation in the indicative mood is relatively simple and is found in Slot 1 under the form of the morpheme **nu**. However, the prefix **nu** interacts with modality and appears under the form of the morpheme **na(n)** in "weak" modality (negative wishes, requests, commands) but under the form **bara** in "strong" modality (negative assertions).

According to Jagersma (2010, p. 551), **ḫa** and **nu** (Slot 1) are proclitics that need the presence of another prefix immediately after them. The modal negative prefixes (**ga**, **bara**, **na(n)**) can appear at the beginning of the verbal complex without need of the proclitics in Slot 1.

5.4.3.2 Finiteness

A possible point of controverse is the node FinP.

The morpheme most frequently interpreted as a finite marker in Sumerian is the prefix **/i/** (with its allomorphs **/a/** and **/a(l)/** and a regional variation of **/i/, /e/**, all of which were probably preceded by a glottal stop) (Jagersma 2010, Zólyomi 2017). This finite marker morpheme is constrained by a phonological rule: it appears only when the verbal form that follows starts with a consonant cluster. Some authors assume that if the verbal form starts with a vowel or a single consonant, then the “vocalic prefix” or finite marker is a null morpheme Ø. Therefore, it could be a simple phonological requirement that makes utterances pronounceable, rather than a true marker of finiteness. In any case, for our purpose in this work, whatever its function might be, it can be placed in between the two modal positions without affecting the rest of our reasoning.

In Rizzi's cartography, the finite marker is at the end of the "periphery", therefore above the Modal Heads. If Functional Heads in the OV order were all final and if the Sumerian finite marker of Slot 2 were above the middle field, it would have to be linearized after slots 13 and/or 14. Alternatively, if the Functional Heads are initial even in OV orders, the finite marker would have to come before the modal **ḫa**, which always occupies Slot 1, and not in Slot 2, as described in Table 4.

To address this issue – since Slot 2 can be occupied by other modals than **ha** – it is conceivable that Slot 2 does not contain finite markers, but only certain classes (or flavours) of modals (deontic, volitional, etc.).

5.4.3.3 Coordination

The atypically located Coordination head (morpheme **-nga)** in Slot 3 has very little statistical support, since it occurs only in few instances in the known corpus. I wrote it down in the structure, but perhaps it should be ignored as it might be only a contaminant coming from Akkadian (Jagersma 2010, p. 513). If it is a true feature of Sumerian, then it is probably an adverb meaning *also* or *too*.

5.4.3.4 Voice

Slot 4 (and the first part of slot 5) corresponds to the Voice node. Woods (2008) proposes that the morpheme **mu** in slot 4, as well as its phonological/allophonic variations (**i**, **ib**, **im**, **imma**), and the prefix **ba** in slot 5, are part of the Sumerian voice system. This explanation is coherent with a general linguistic approach and sheds light on the nature of what Sumerologists and Assyriologists call the *ventive or cislocative prefix* **mu**. The concept behind the "ventive" is that it expresses predication from the point of view of the Subject, including the idea of an abstract movement towards the subject (either in space or in time or yet in other dimensions). Opposite to this, the middle voice prefix **ba** expresses a predication from

the point of view of the object, i.e., away from the subject. In linguistic terms, this directionality of action is explained by the diathesis as defined by Zúñiga and Kittilä (2019) and the connections between voice and grammatical/thematic roles.

Woods' (2008) explanations are compatible with the structure proposed by Legate (2012), according to which the Voice function is immediately above the VP, as in Figure 5 (p. 32).

In summary, Slots 4 and 5 in the Sumerian VP template carry the Voice function and contribute to establishing the thematic roles of the participants in the next slots. Since **mu** and **ba** are mutually exclusive, it can be said that these two slots are in fact a single cartographic position.

5.5 The verbal complex

In the tree in 31), the content of slot 6 (and the last part of slot 5), that I called "Clitic", is in a position that enables local agreement with the first Applicative, as described in Table 10.

Inside the VP, the various High Applicative projections are placed on the spine and fill Slots 7 to 10 (recall the description of Applicatives in Section 3.5, p. 41), essentially as proposed by Niedzielski (2017).

As seen in Section 3.2.2 and Figure 4, Slot 13 can be explained by the presence of an Inner Aspect head next to the lexical verb stem of Slot 12.

If Aspect is an internal property of the verb, one can explain the existence of the -**/ed/** suffix in Sumerian as a way to give *marû* aspect to some verbs that use the same root for both their *ḫamtu* and *marû* forms (Class 3 verbs in Table 5 above). If the syntactic structure contains a node for aspect within the verb domain, this node can accommodate the -**/ed/** suffix within the verb stem. This view clarifies the role of -**/ed/** as an Aspect marker and not as a Tense inflexion, and at the same time corroborates the idea that Sumerian does not have a Tense function.

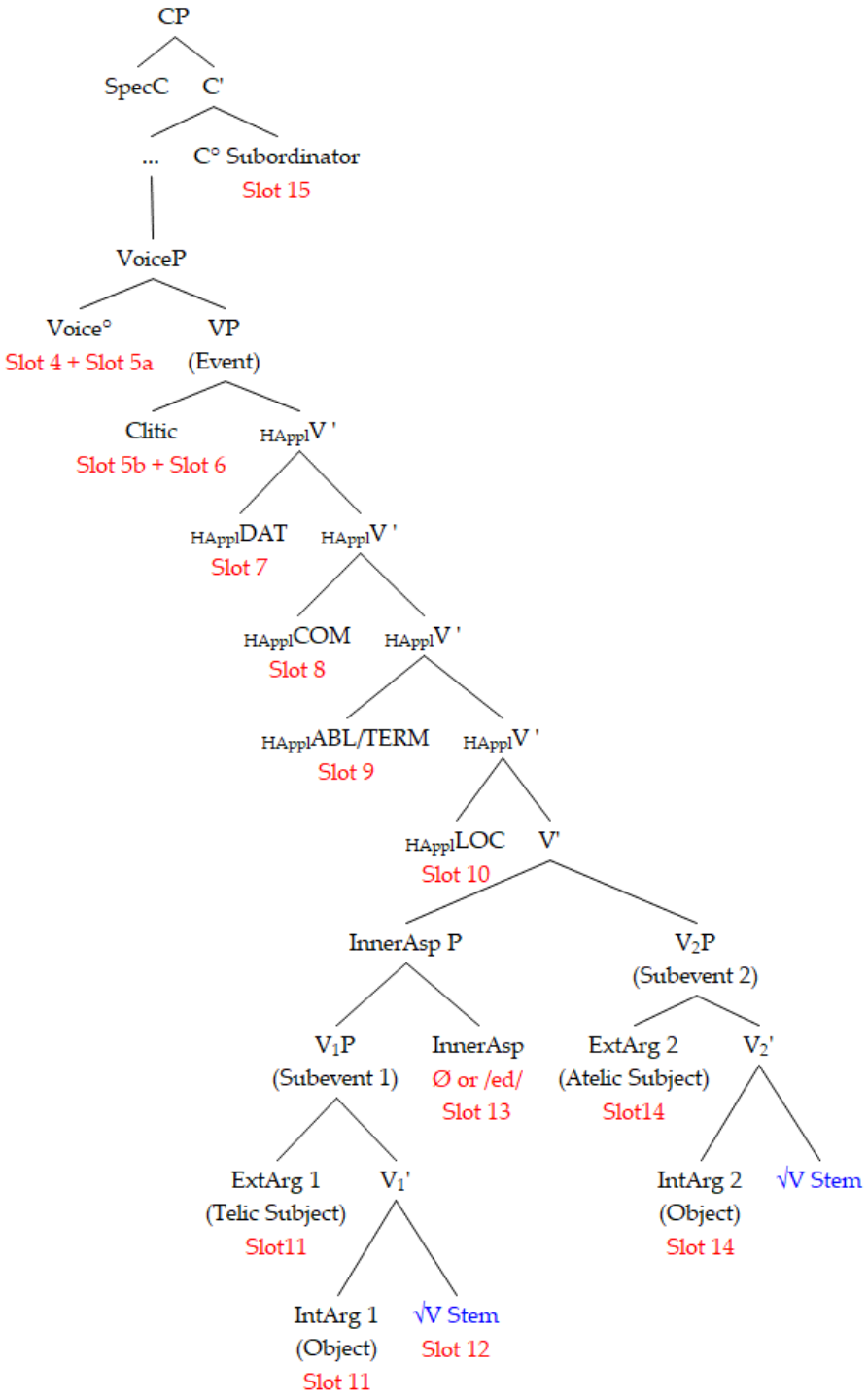
Slots 11 and 14 have alternating contents. As seen in Table 6 (p. 24), the morphemes in these slots can cross-reference the ergative (agentive) subject (A), or the unergative subject (S) or the object (P).

Following Ramchand (2008, 2024) (see section 3.4), I consider the predicate as a complex event, composed of subevents that create the different types of verbs. The set of subevents determines the lexical specification of the verb, for example the power to assign case and the number of arguments. The main idea behind this view is that the syntactic projection of arguments is based on event structure.

As discussed in section 3.4 (p. 36), both the telicity of the event and the types of participants (Agent, Patient, Goal/Path, Location, etc.) are reflected in the syntactic structure. This observation leads to convincing explanations of phenomena such as the cross-linguistic transitive/intransitive alternation of some verbs (like *drink* or *eat*) or the agent/patient alternation when active voice clauses are expressed in the passive voice. Building on these observations (see Van Hout 2002a and 2002b), I propose an internal structure of the verb in Sumerian that places the Agent and the Patient in different positions according to both Aspect and Transitivity (whose telicity depends on Aspect).

(Syntax tree on next page)

31)



In 31), there are two possible candidates to fill both Slot 11 and Slot 14. The fact that there is no attested sample showing the contents of Slots 11 and 14 appearing one immediately after the other, neither before the verb nor after the verb, indicates that there is a constraint that makes their presence in the same slot mutually exclusive. One possibility is a phonological conflict between the pronoun-like morphemes. Or, if the constraint is structural, it is possible that the mapping of the event structure into syntax does not create a X-bar structure and the

V_1 and V_2 verb stems have no intermediate projection V_1' and V_2', which means there would be only one place for an argument on each side of the verb.

I will keep the trees with a V' intermediate projection because the concept of event structure calls for a differentiation between subevent "Subjects" or THEMES and "Objects" or RHEMES, but the option with a single argument on each branch is acceptable too.

If the event is intransitive, the subject-referencing morpheme is the argument identified first (there is no direct object, anyway) and it appears in slot 14, while slot 11 is left empty or else cross-references the oblique object (if it exists and an Applicative brings it into the verbal field). This happens both in the perfective and imperfective Aspect (Figure 14).

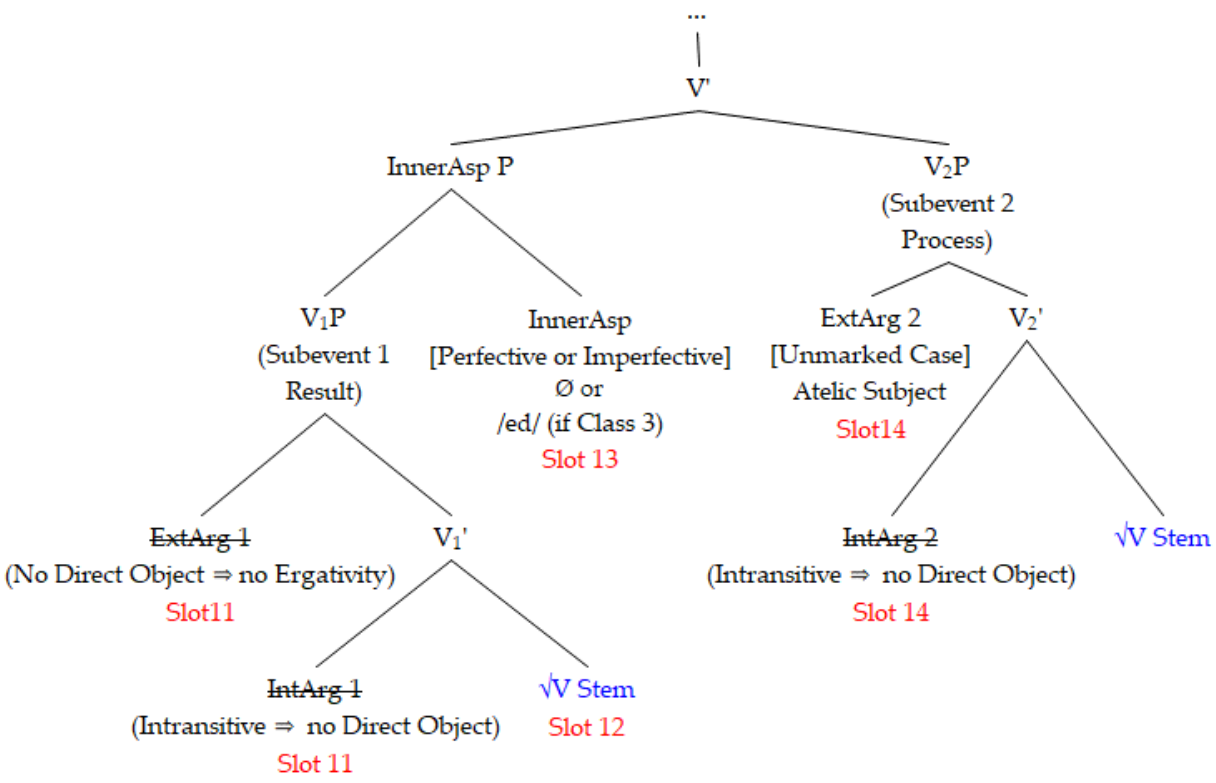


Figure 14. Argument projection of intransitive verbs.

Transitive verbs are telic in the perfective Aspect, but atelic in the imperfective (imperfective events don't set an ending point).

Transitive perfective events must identify a Patient (or Theme) and an Agent. The external argument surfacing in Slot 11 is identified as the Agent. At this point, Slot 11 becomes unavailable for the object. Therefore, the internal argument surfacing in Slot 14 is identified as the Direct Object. Ergative case is attributed to the Agent/Subject. An unmarked case, called absolutive by opposition to ergative, is attributed to the Patient/Object. (Figure 15).

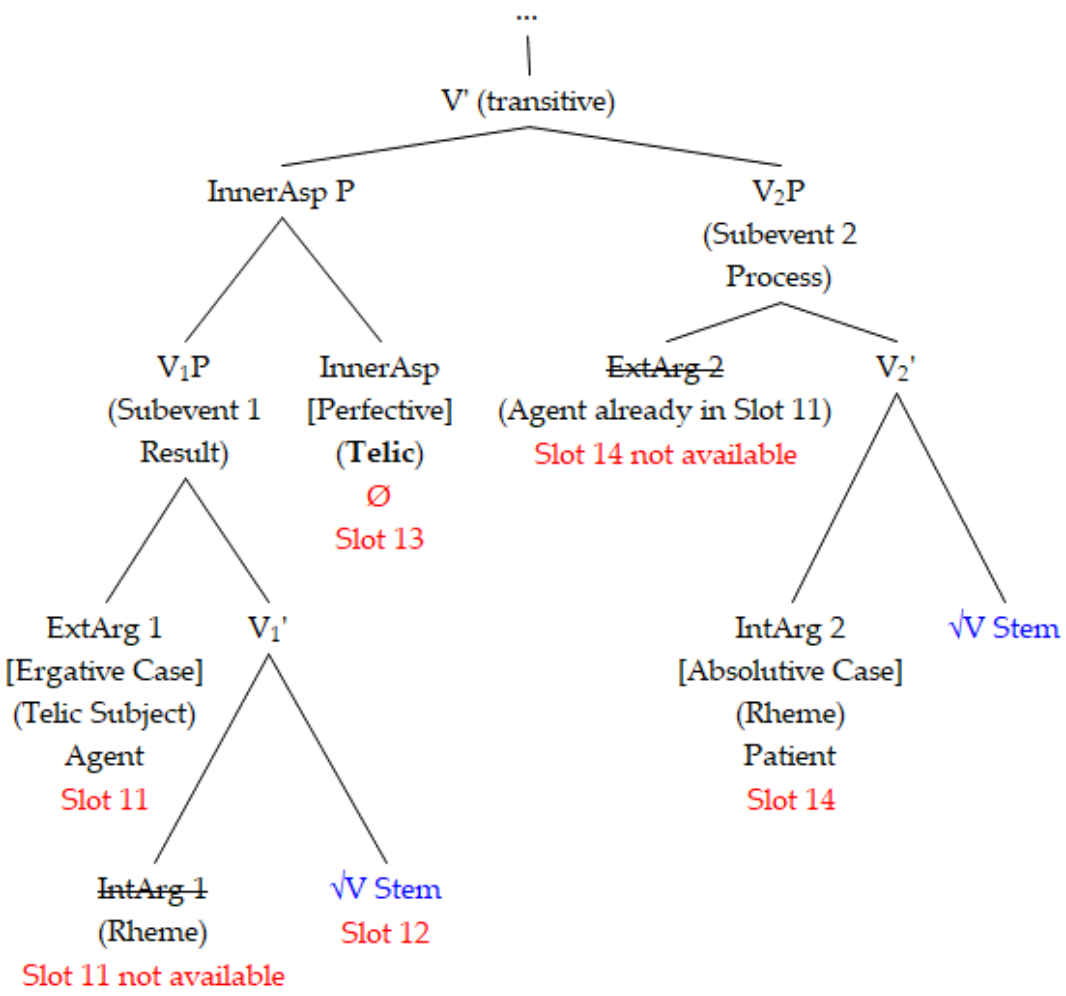


Figure 15. Argument projection of transitive verbs in the perfective aspect.

Transitive imperfective events, on the other hand, are atelic.

The transitive process must identify the Patient as well as the Agent. The first argument needed is the Initiator of the process, the Agent. It is projected to the external argument position that surfaces in Slot 14, which is licensed by the atelic subevent V_2. Since this subevent is not c-commanded by a Telic Aspect head, it cannot attribute ergative case. Therefore, a default, unmarked, case is attributed to this argument, which assumes the role of Subject. The case of the Subject is called nominative in the grammatical tradition, and this name can be used here too.

Next, a Transition Event must identify a Patient/Direct Object. The internal argument of the Process subevent, Slot 14, is not available anymore, so the object is projected to the next closest available position, the internal argument place of the Result subevent V_1, which surfaces in Slot 11. Since this is an Atelic event and since this element is in the patient role, it cannot be attributed an Ergative case, therefore it gets an unmarked case. If the Subject's unmarked case was called nominative, then the Object's case, equally unmarked, is called accusative by opposition (see Figure 16).

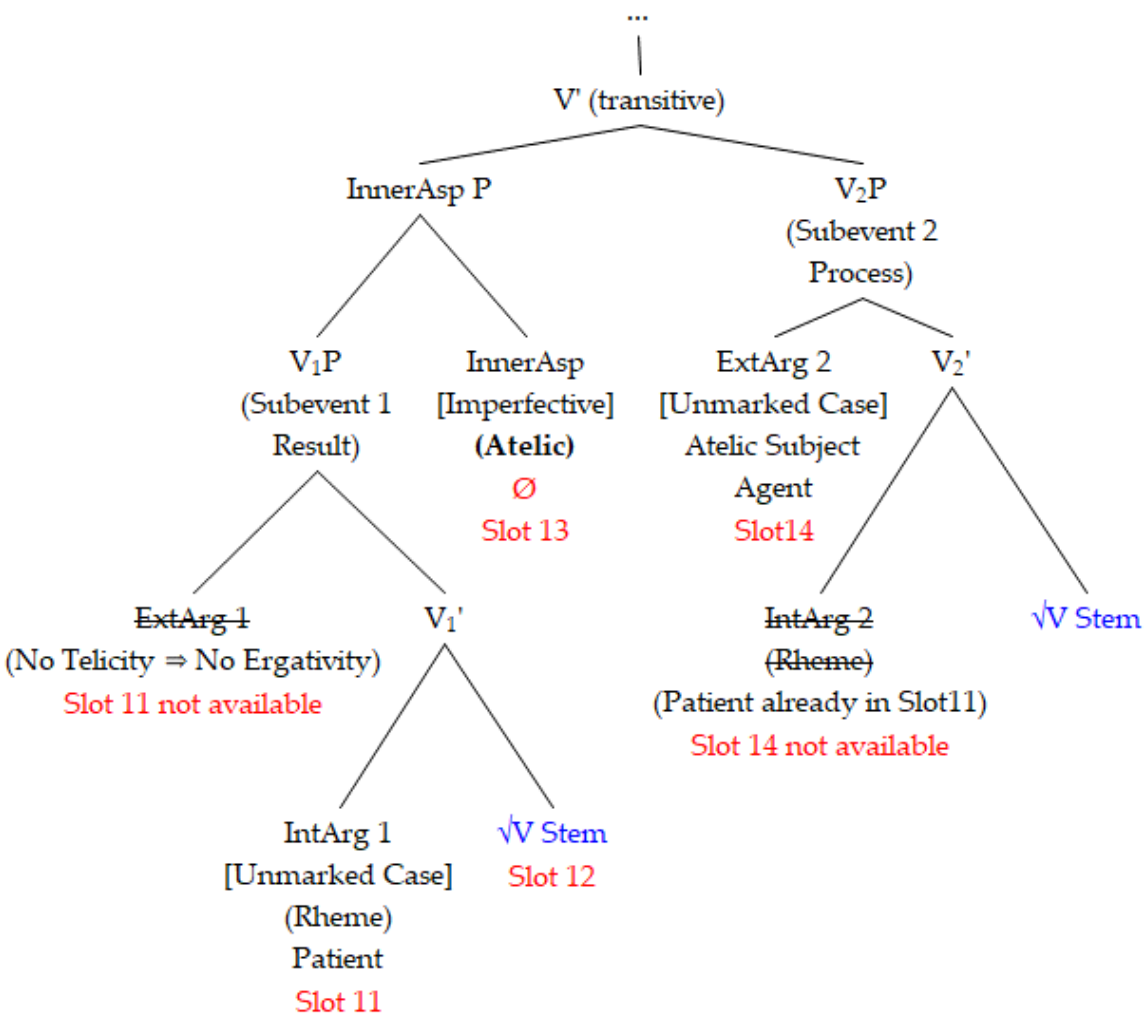


Figure 16. Argument projection of transitive verbs in the imperfective aspect.

5.6 Applying the template

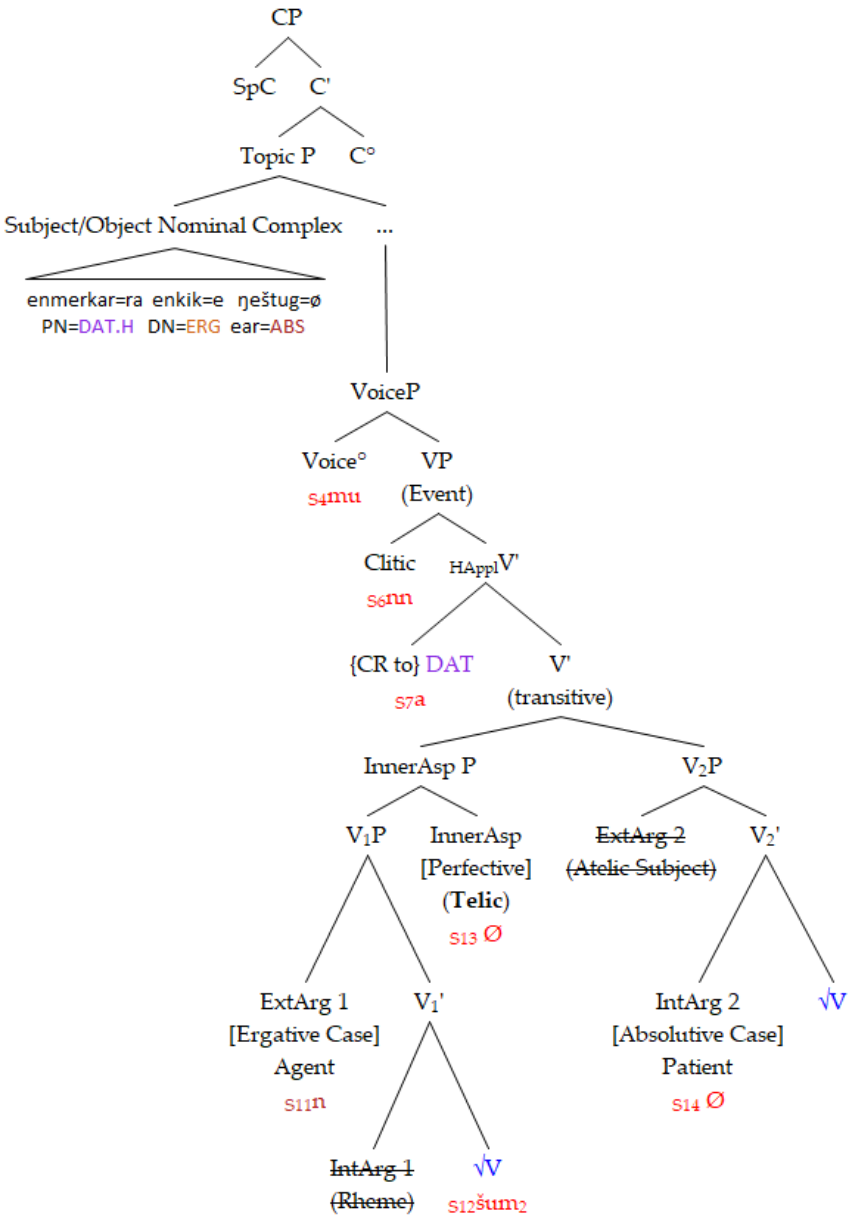
The following examples show the application of the template to phrases extracted from the corpus of Sumerian inscriptions and literature:

5.6.1 Indicative

The transitive sentence in 32) shows how Slot 7 in the VP, the dative phoneme **a**, cross-references the nominal object **Emmerkar**, which bears the dative case marker **ra**. The Subject **Enki** bears the ergative case marker **e** and is in agreement with the pronominal prefix **n** in Slot 11. The object **ŋeštug**, bearing the null marker of nominal absolutive case, is cross-referenced in Slot 14 by the absolutive null suffix. The clitic in Slot 6, **nn**, agrees with the gender (human), person (3rd) and number (singular) of the dative phoneme in Slot 7.

32) From *Enmerkar and the Lord of Aratta 420 (ETCSL 1.8.2.3)*

en-me-er-kara -ra ^{d}en-ki-ke$_4$ ŋeštug$_2$ mu-na-an-šum$_2$
enmerkar=ra enkik=e ŋeštug=ø $_{S4}$mu-$_{S6}$nn-$_{S7}$a-$_{S11}$n-$_{S12}$šum$_2$-$_{S14}$ø
PN=DAT. DN=ERG ear=ABS VEN-3SG-DAT-3SG.A-give-3NH.P



"The god Enki gave wisdom to Enmerkar."

5.6.2 Interrogative

33) From *The three ox-drivers form Adab 15 (ETCSL 5.6.5)*

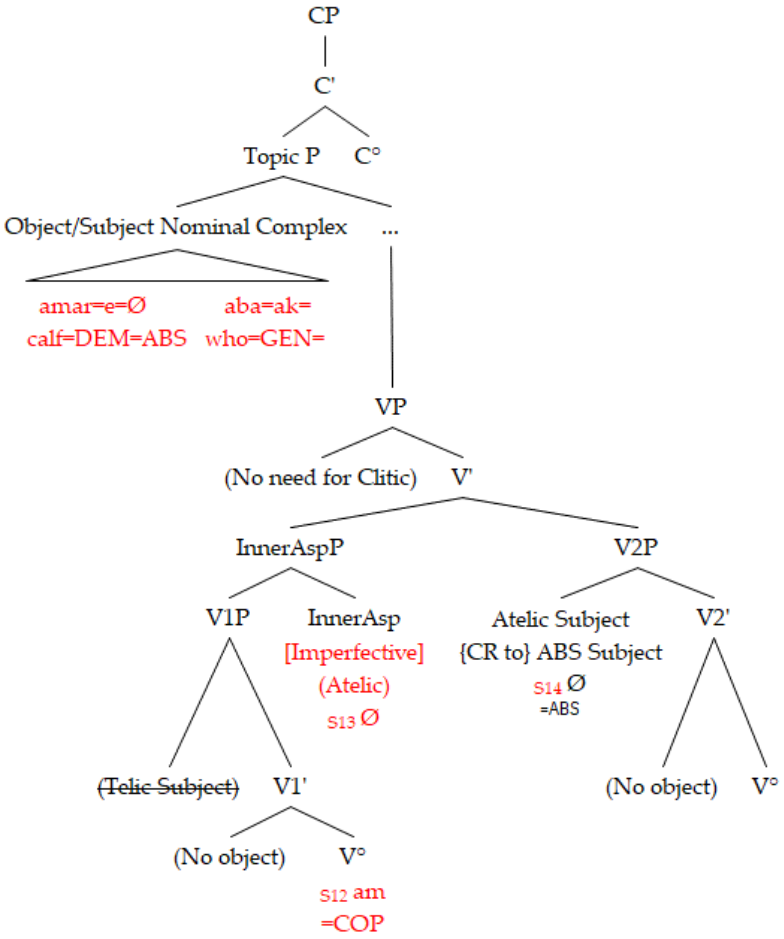
amar-e a-ba-kam
amar=e=ø aba=ak=am-ø
calf=DEM=ABS who=GEN=COP-3SG.S
"This calf of whom is?" or *"Whom does this calf belong to?"*

Legend:

{CR to}= "Cross-reference to"

PN=Personal name

DN= Divinity name



The copula **am** is intransitive and imperfective. There is no pronominal prefix in Slot 11, since there is no ergative subject. Instead, the pronominal suffix in Slot 14 cross references the absolutive Subject **amar-e** (where **-e** is the demonstrative "this" applied to the noun **amar** "calf").

The Wh-word **aba** is part of the Subject/Object complex. Since the nominal complex has not been properly examined in this work, I chose to show it as a whole, without structural detail. However, it is interesting to note that the Wh-word is not cross referenced outside the nominal complex.

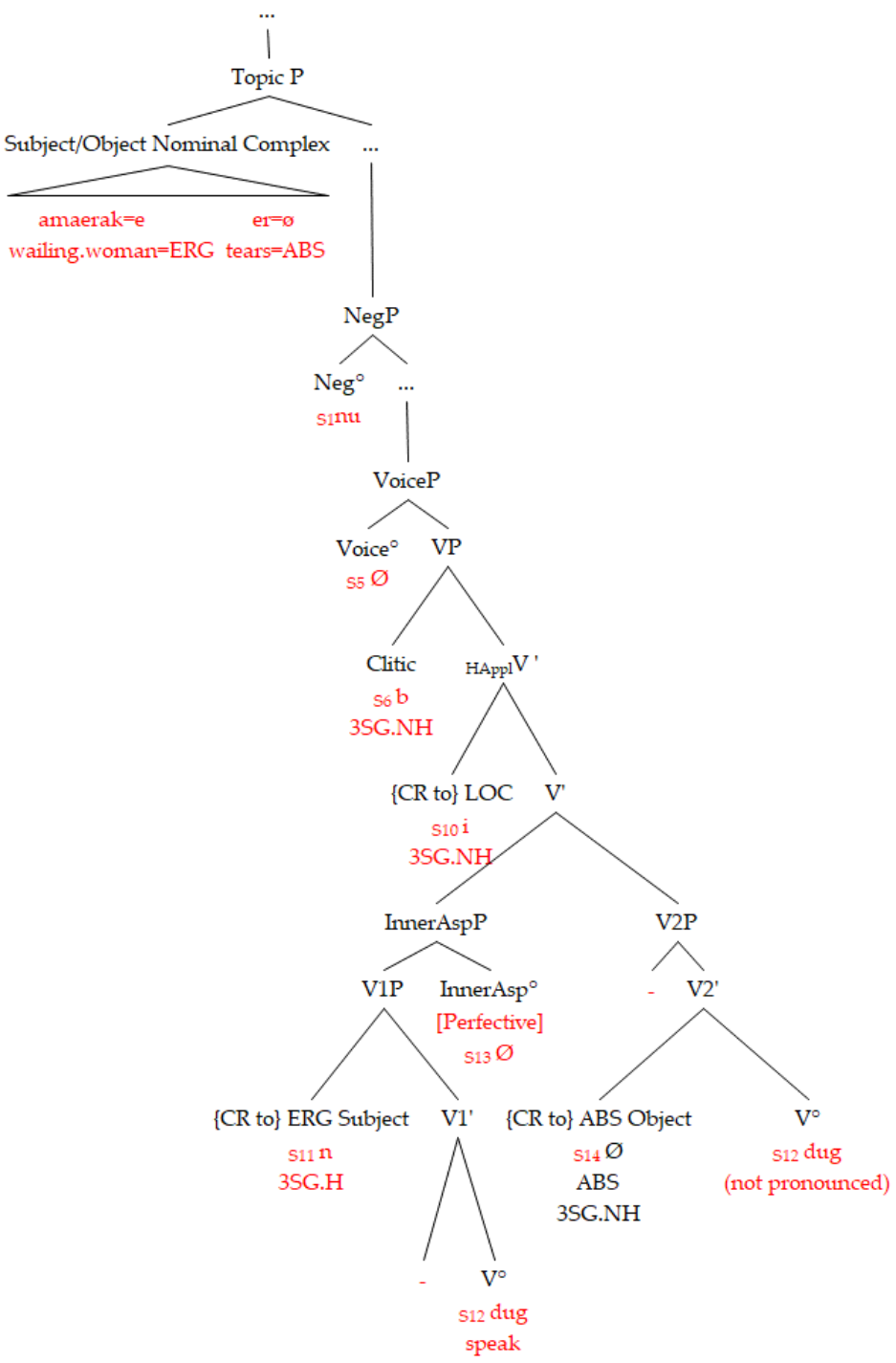
5.6.3 Negative

The structure of the negative phrase in 34) shows the negation prefix **nu** in Slot 1. The rest of the structure is identical to that of the indicative sentence.

34) From *Gudea Statue B 5:4 (Lagash, 22nd c.) (P232275)*

ama-er$_2$-ke$_4$	er$_2$	nu-bi$_2$-dug$_4$
amaerak=e	er=ø	nu-b-i-n-dug-ø
wailing.woman=ERG	tears=ABS	NEG-3.SG.NH-L2-3.SG.H.A-speak-3.SG.P

"The wailing woman did not utter laments."



5.6.4 Subordinated

This complex sentence is an example of administrative/legal reporting. In order to be extremely clear, the author repeats the name of **Ur-nigar**, once as the subject of the main sentence and another time as the indirect object of the subordinated sentence.

35) From *SNAT (Selected Neo-Sumerian administrative texts from the British Museum) 360 rev. 7-9 (Umma, 21st c.) (P130120)*

ur-niŋarŋar-ke$_4$ samx(NINDA×ŠE.A) geme$_2$
urniŋarak=e sam geme=ak=ø
PN=erg price maiden=GEN=ABS

ki lu$_2$-^{d}šara-ta šu la-ba-an-ti-a
ki lusara=ak=ta šu=e $_{S1}$nu-$_{S5}$ba-$_{S11}$n-$_{S12}$ti-$_{S14}$ø-$_{S15}$ʔa=ak
place PN =GEN=ABL hand=L3.NH NEG-MID-3SG.A-approach-3NH.P-SUB=GEN
"That Ur-nigar did not receive the price of the maiden (female servant) from Lu-Shara,

ur-niŋar^{ŋar}-ke$_4$ nam-erim$_2$-bi kud-dam
[urniŋarak=e namerim=bi=ø kud-ed=ø]=am-ø
[PN=ERG oath=3NH.POSS=ABS cut-PF=ABS]=COP-3NH.S
Ur-nigar is to take an oath about it."

"[Of (the fact) that Ur-nigar did not receive the price of the maiden] [Ur-nigar is to take an oath]"

The genitive at the end of the subordinated segment, **ak**, transforms it into an oblique object of the main sentence ("of the fact that…"). The subordinated part is a nominalized phrase, with the morpheme **ʔa** ("*that"*) in its Slot 15.

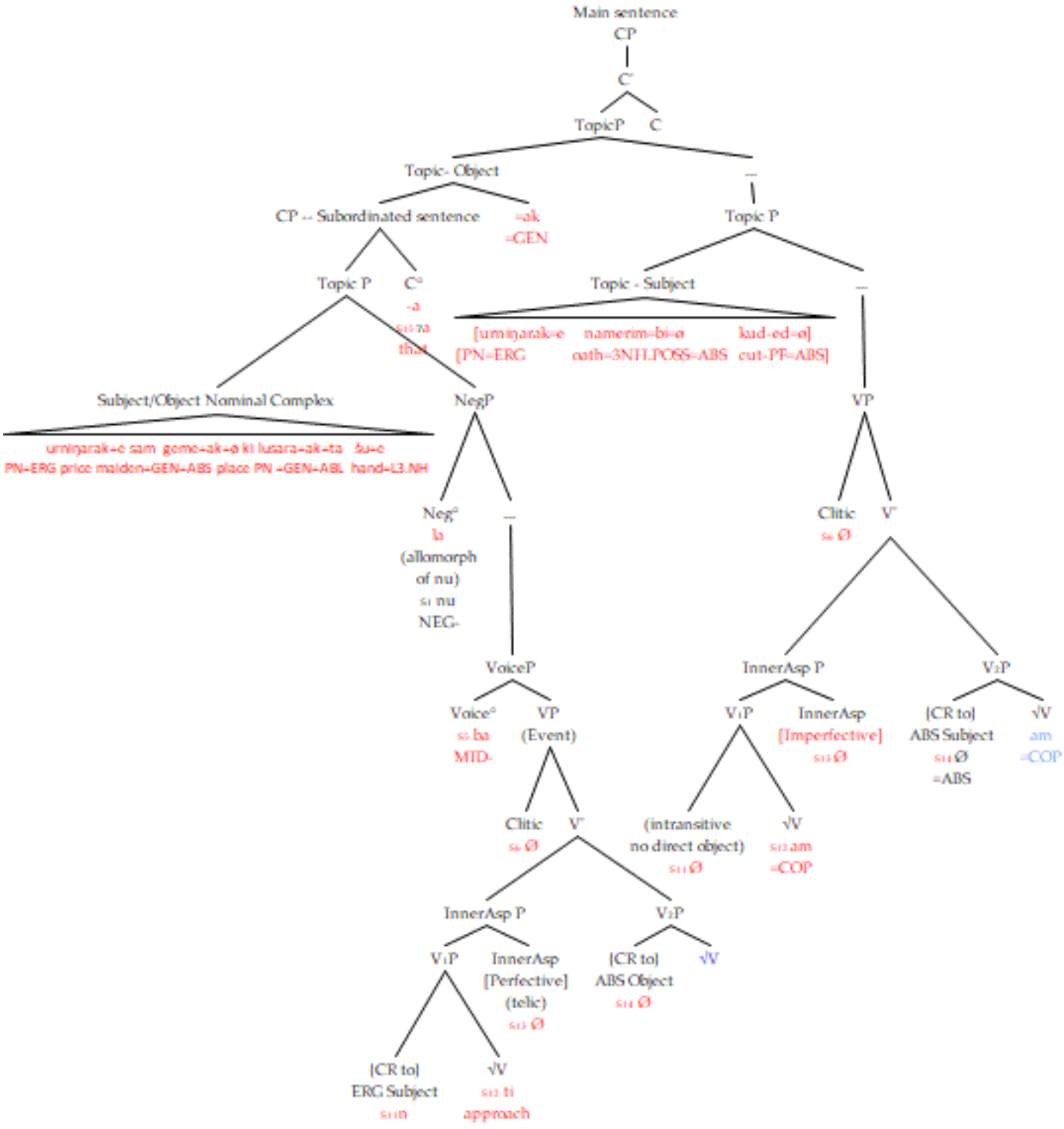
Both parts, main and subordinated, are complete sentences showing the cross-referencing of Subject/Object elements inside their respective VPs.

The verb of the main sentence is the copula **am**. The Subject is a participle construction whose verb, **kud**, bears the imperfective Aspect marker **ed**, to mean that the event has not taken place yet. The copula implies that it is expected to happen in the immediate future with a degree of obligation, in a way similar to the Latin construction "*Carthago delenda est".*

The verb of the subordinated sentence is a compound verb made of the noun **šu** ("*hand"*) and the verb **ti** ("*to approach"*), which means "*to receive"*. The morpheme **ba** in Slot 4/5 is the middle marker, acting as a passive prefix, indicating that "the payment for the slave maid is not received by Ur-nigar".

The combination of the noun **ki** ("*place"*) with the ablative **ta** in **ki lu$_2$-^{d}šara-ta** is a typical construction in Sumerian to designate the human source, in this case a man called **Lu-šara**.

(Syntax tree in next page)


Main sentence
CP
C'
TopicP C
Topic- Object
CP -- Subordinated sentence
=ak
=GEN
Topic P
C°
-a
s13 ?a
that
Subject/Object Nominal Complex
urninjarak=e sam geme=ak=ø ki lusara=ak=ta šu=e
PN=ERG price maiden=GEN=ABS place PN =GEN=ABL hand=L3.NH
NegP
Neg°
la
(allomorph of nu)
s1 nu
NEG-
VoiceP
Voice°
s5 ba
MID-
VP
(Event)
Clitic
s6 Ø
V'
InnerAsp P
V1P
InnerAsp
[Perfective]
(telic)
s13 Ø
{CR to}
ERG Subject
s11 n
√V
s12 ti
approach
V2P
{CR to}
ABS Object
s14 Ø
√V
_
Topic P
Topic - Subject
[urninjarak=e
[PN=ERG
namerim=bi=ø
oath=3NTI.POSS=ABS
kud-ed=ø]
cut-PF=ABS]
_
VP
Clitic
s6 Ø
V'
InnerAsp P
V1P
InnerAsp
[Imperfective]
s13 Ø
(intransitive
no direct object)
s11 Ø
√V
s12 am
=COP
V2P
{CR to}
ABS Subject
s14 Ø
=ABS
√V
am
=COP

5.6.5 Causative

The causative construction in Sumerian does not need a light verb, nor a specific morpheme to mark *cause* or *causer*, as is the case in other languages (see the Quechua example in section 4.4.2). The only syntactic difference is in the number of participants. However, the alternation causative / non-causative implies a transitive / intransitive alternation in the lexical specification of the verb.

Sumerian, at least in the available corpus, does not seem to have stacked or clustered verb constructions. The causative construction 36), for example, differs from the non-causative form 37) only in the number of participants (Zólyomi 2017, p. 224).

36) ^{ŋeš}nu$_2$ gi-rin-na ḫe$_2$-bi$_2$-in-gub-en
nu girin-ø=ʾa $_{S1}$ḫa-$_{S5}$b-$_{S10}$i-$_{S11}$n-$_{S12}$gub-$_{S14}$en
bed flowery-TL=L2.NH MOD-3.SG.NH-L2-3.SG.H.**A**-stand-1.SG.**P**
"She (= Inana) indeed made me step onto the flowery bed."

37) ^{ŋeš}nu$_2$ gi-rin-na ḫe$_2$-ib$_2$-gub-en
nu girin-ø=ʔa $_{S1}$ḫa- $_{S2}$i-$_{S5}$b-$_{S10}$(i>)ø-$_{S12}$gub-$_{S14}$en
bed flowery-TL=L2.NH MOD-FIN-3.SG.NH-L2.SYN-stand-1.SG.**S**
"I indeed stepped onto the flowery bed."

For the reader's comfort, I cite here Zólyomi's explanation, adapted to my numbering (between square brackets []):

> "In ex. [37)] the [first] person "I" is the verbal participant who steps on a bed. In ex. [36)] the same person does the actual stepping, but the clause has an additional verbal participant, [a reference to] the goddess Inana, who causes "me" to step on the bed. The causer functions as the **A** of ex. [36)] and is marked accordingly in S11 with a 3rd ps. sg. human FPP [Final Pronominal Prefix]. The **S** of ex. [37)] functions as the **P** in ex. [36)]. Since in the preterite the pronominal suffix in S14 cross- references the participant in the absolutive, both the **S** in ex. [37)] and the **P** in ex. [36)] [are] cross-referenced with the same morpheme. In other words, the two verbal forms in exx. [37)] and [36)] differ only in the presence of a further verbal participant, the causer; and no other morpheme indicates its causative meaning."

The syntactic explanation of causative phrases in English requires an additional node in the tree. This additional node is in a *v*P shell (Larson 1988), and is occupied by the causative verb ("to make"). But in Sumerian there is no additional verb (no need for a *v*P shell), there is only an additional participant who assumes the role of **A**gent, relegating the first participant to the role of **P**atient.

The verb, **gub** ("to stand"), is intransitive in the non-causative sentence, with a Subject suffix in Slot 14 (absolutive). It becomes transitive in the causative sentence, with the Agent in Slot 11 (ergative) and the Patient in Slot 14 (absolutive). This behaviour is parallel to the transitive-intransitive alternations of unaccusative verbs in modern languages like English:

38)
a) I broke the cup.
b) The cup broke.

In an alternation that recalls the Active/Passive contrast in modern European languages, the Sumerian non-causative Subject becomes a causative Patient:

39)

Non-causative:

ŋešnu₂ gi-rin-na ḫe₂-ib₂-gub-en

nu girin-ø=ʔa $_{S1}$ḫa- $_{S2}$i-$_{S5}$b-$_{S10}$(i>)ø-$_{S12}$gub-$_{S14}$en (syncopated Locative2)

bed flowery-TL=LOC2.NH MOD-FIN-3.SG.NH-L2.SYN-stand-1.SG.**S**

"I indeed stepped onto the flowery bed."

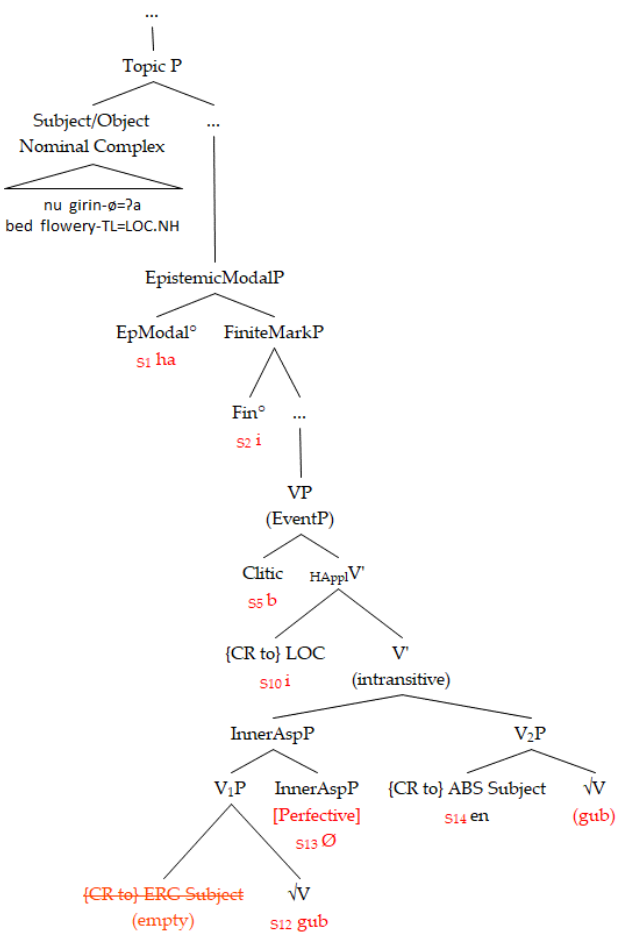
Causative:

ŋešnu₂ gi-rin-na ḫe₂-bi₂-in-gub-en

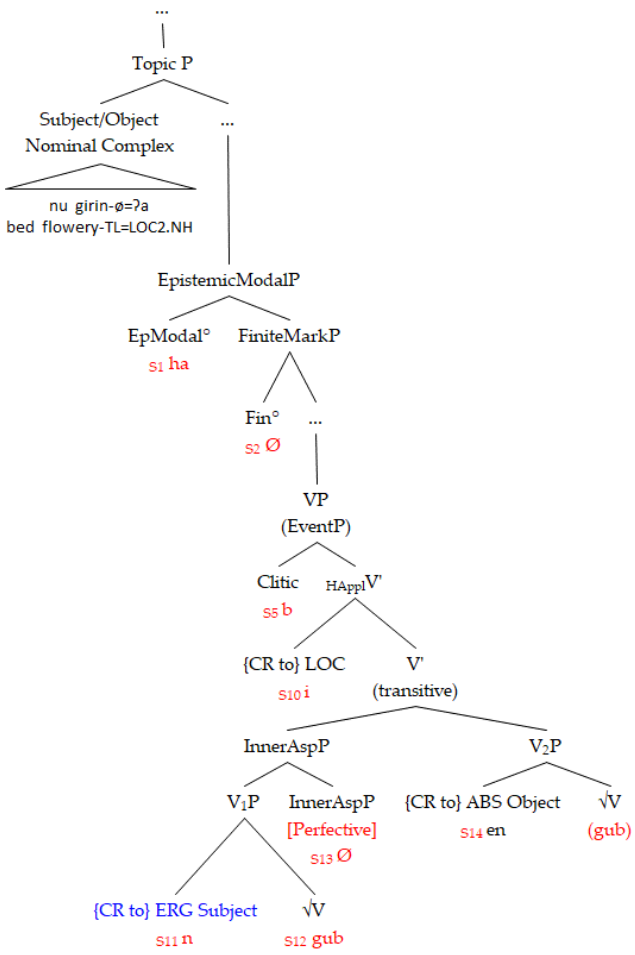
nu girin-ø=ʔa $_{S1}$ḫa-$_{S5}$b-$_{S10}$i-$_{S11}$n-$_{S12}$gub-$_{S14}$en

bed flowery-TL=LOC2.NH MOD-3.SG.NH-L2-3.SG.H.**A**-stand-1.SG.**P**

"She (= Inana) indeed made me step onto the flowery bed."



Non-causative form



Causative form

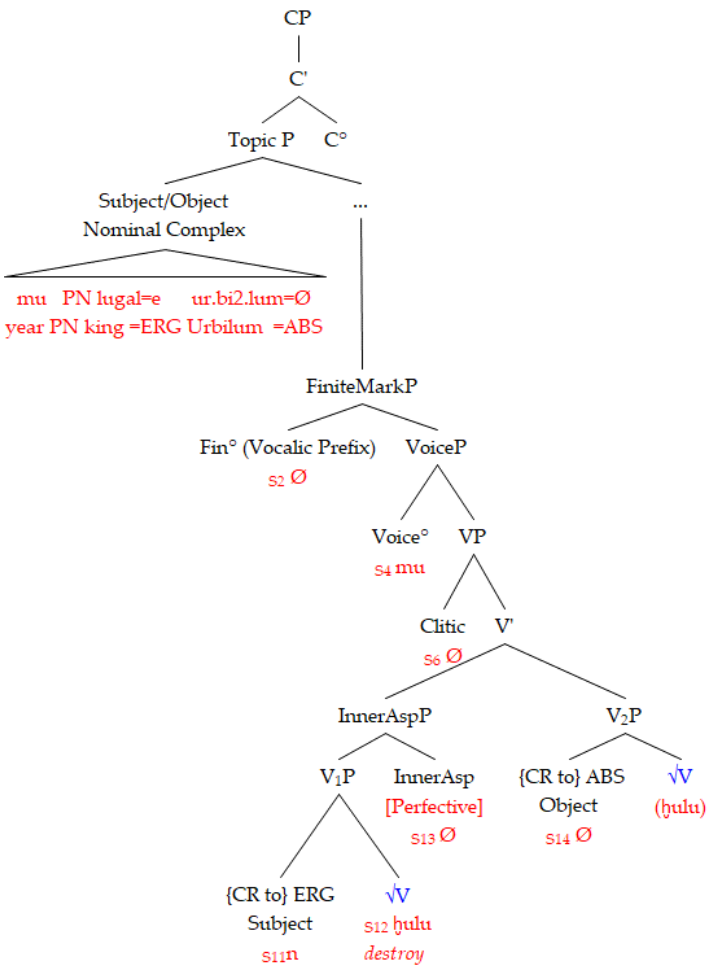
5.6.6 Active vs. Passive

The alternation active/passive resides exclusively on the Voice prefix in Slot 4. The active voice uses **mu** (or a form interacting with the so called "vocalic prefix" **i**, depending on the perspective) and the passive voice uses the middle marker **ba**.

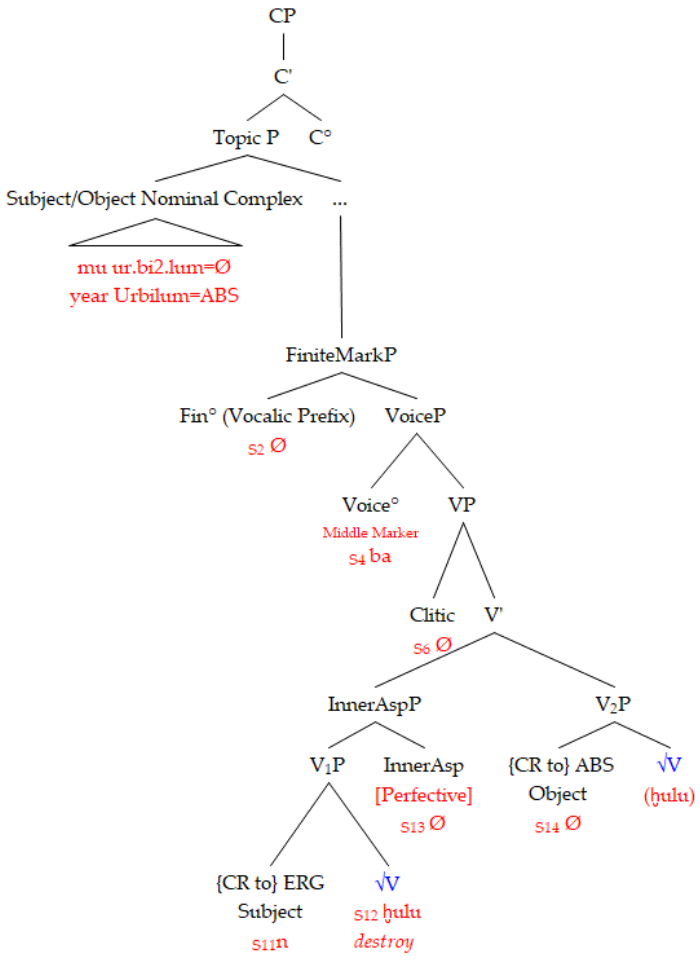
40) (from Jagersma 2010, p. 494)

Active:
mu PN lugal-e ur-bi$_2$-lum^{ki} mu-ḫulu
mu PN lugal=e ur.bi$_2$.lum=Ø Ø-mu-n-ḫulu-Ø
year PN king =ERG Urbilum=ABS VP-VENT-3SG.**A**-destroy-3N.S.**P**
"The year PN, the king, destroyed Urbilum." (AUCT 1:70 7; D; 21)

Passive:
mu ur-bi$_2$-lum^{ki} ba-ḫulu
mu ur.bi$_2$.lum=Ø Ø-ba-n-ḫulu-Ø
year Urbilum=ABS VP-MM-3SG.**A**-destroy-3N.S.**P**
"The year Urbilum was destroyed." (AUCT 1:883 7; D; 21)



Active



Passive

5.6.7 Imperative

In Sumerian, the imperative clause puts the verb stem ahead of all the slots. The contents of the slots continue to be pronounced, as in 41):

41) ku$_3$ urdu$_2$-da ře$_6$-um
ku$_3$.g urdu$_2$.d=ak=Ø ře$_6$-Ø-mu
silver slave=GEN=ABS bring-$_{S2}$VocP-$_{S4}$VENT
"Bring the silver of (for) the slave!"

The LPH theory, seen in Section 3.2.4 on p. 32, would have the imperative stem *after* Slot 4, *before* Slot 5-6. Therefore, we cannot use a vP shell to explain the position of the verb stem in Sumerian imperatives. Only a functional node above the Voice system would be adequate.

A functional node like the JussiveP of Zanuttini (2008) is said to require head movement of the verb towards this higher position, which explains the subject or prefix/proclitic inversion phenomenon in imperatives in other languages. However, until now at least, there has been no need to invoke movement in the syntax of Sumerian. To keep away the need for syntactic movement, it is possible to use the idea of a functional node (a kind of JussiveP) above VoiceP (Slot 4), on which the imperative stem could be generated directly. Another stem (a copy), with the same characteristics, could be generated in the lowest V° position (Slot 12) to license the prefixes in Slots 5-11. But since both stems would have the same morphophonological form, only the first one would be pronounced. This explanation, although not totally satisfying, is – at this point – empirically adequate.

However, there is another possibility that does not require the creation of a specific functional node:

The negative imperative (prohibitive) behaves as a normal phrase, keeping the verb stem inside, in Slot 12, as in 42):

42) *The instructions of Shuruppak* 154 (ETCSL 5.6.1)
[kar]-kid na-an-sa$_{10}$-sa$_{10}$-an
karkid=ø $_{S2}$na -$_{S11}$n -$_{S12}$sa~sa -$_{S14}$en
prostitute=ABS NEG.MOD-3.SG.H.P-buy~PF-2.SG.A
"Do not buy a prostitute!"

This indicates that, in Sumerian like in other languages, the canonical imperative acts as a deontic modal. In affirmative imperatives, the locus of the IMP feature is on Slot 2, where the deontic modals sit. In the absence of the standard modals and the negation morpheme, the verb stem is fronted to the beginning of the verb domain as a kind of modal auxiliary. Semantically, this verb fronting indicates the central importance of the verbal predicate in this type of phrases. There is no surprise here, since imperatives have a modal nature: they are operators for the handling of a possible world in which the will of the speaker is imposed over the addressee.

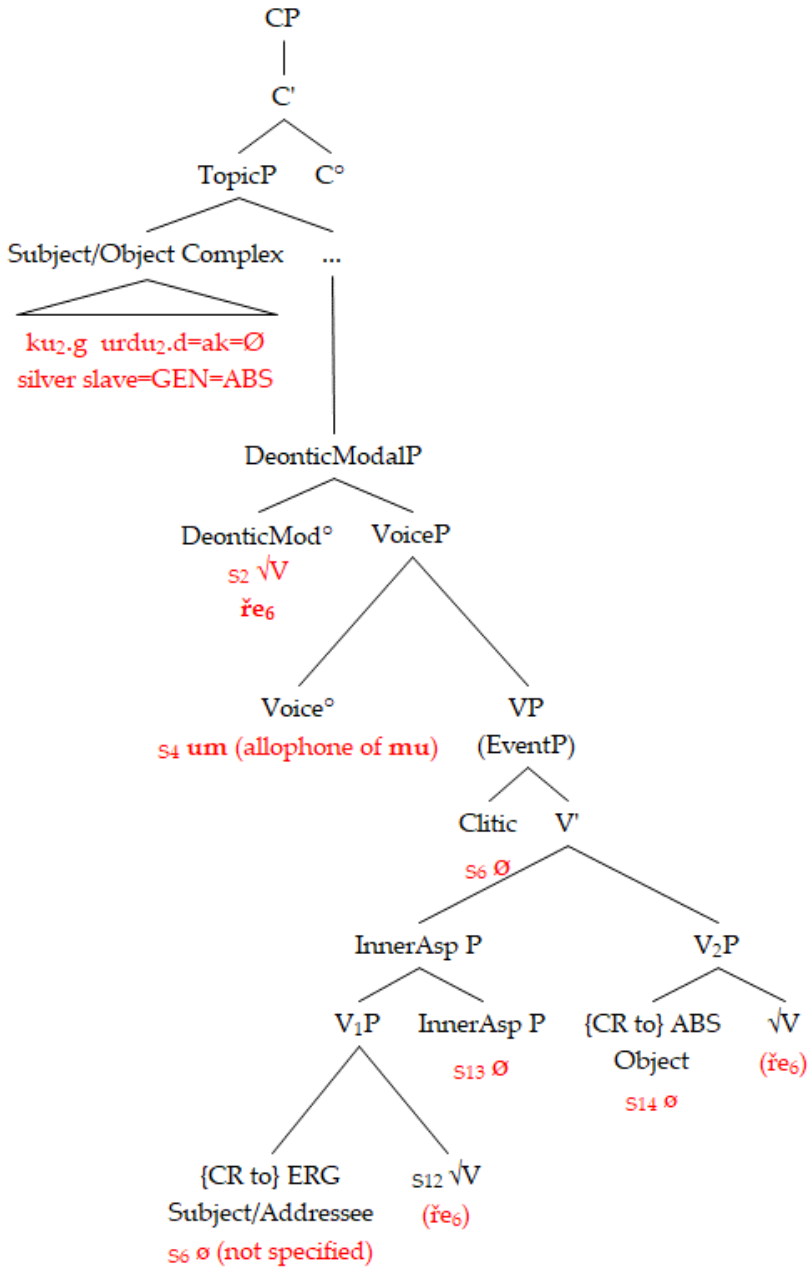
In negative imperatives, Slot 1 is occupied by the Negation morpheme and Slot 2 by the deontic modal. Like in many other languages, the negation of the imperative has a different syntactic, and probably semantic, mechanism.

In examples 41) and 42), the Subject and Object remain ahead of the verbal complex; there is no subject inversion as in other languages. The reason for this, I propose, is that Subject and Object are higher above the Slots positions, as Topic or Focus, while the canonical imperative

in Sumerian places the verb stem in Slot 2, as a deontic modal, without affecting the placement of Subject and Object.

43) From *Studies Sigrist p. 138 BM 106527 rev 4; U; 21*

Ku$_3$ urdu$_2$-da ře$_6$-um
Ku$_3$.g urdu$_2$.d=ak=Ø $_{S2}$ře$_6$-$_{S4}$mu
silver slave=GEN=ABS bring-VENT
"Bring me the silver of (for) the slave!"



Note again the placement of the verb stem in the slot that usually carries the Deontic Modal prefix. Lower copies of the verb stem **ře$_6$** are not pronounced.

6 Summary and conclusion

Sumerian is the oldest language of which we have a documented trace, because Sumerians were the first to implement a writing system capable of representing human speech. It is also a peculiar language with no surviving relatives, a language isolate. It appeared more than five thousand years ago, and it probably reflects characteristics of the human cognition system at that time, since a language is an attribute of the collective mind of its speakers. When Sumerian was a vernacular, civilization – with the radical changes in the structure of human societies that came with it – was a relatively fresh development. Many dimensions of social life were different in the sedentary world versus those that prevailed in previous nomadic groups. The mental system of those early civilized humans was very different from those of modern societies. Not in a physiological way – the state of biological evolution of *homo sapiens* at that time was essentially the same as today's state – but rather psychologically and culturally. Naturally, their language structure and characteristics are very different from those of modern languages.

As Diakonoff (1983) noted, Sumerian, like other very old languages, is an "archaic"[36] language, "*lacking the means to express abstract ideas"*. Grammatically, one of its distinguishing characteristics is the absence of a Tense function ("*very inadequate means to express the idea of time, etc."*). But perhaps it would be better to say that "archaic" languages had other ways of expressing abstract ideas, and that those abstractions were different from those me make in the modern world. Regarding time, the fact that the Sumerian language does not have a very specific feature to deal with Tense means simply that those societies had different ways to consider and track time – especially relative time, which is the kind that the Tense function encodes. What looks inadequate to Diakonoff was surely adequate enough for the Sumerians.

Sumerian is also a systematically agglutinative language, where all the grammatical components are explicit. It has a rigid (invariable) disposition of lexical and functional elements organised in "slot systems", separately for the nominal group and for the verbal group.

The abundant empirical data to which we have access – through hundreds of thousands of clay tablets written using the cuneiform script – is sufficient to describe the grammar of Sumerian in a quite complete way. Of course, since this is now a dead language for the last four thousand years or so, we cannot know to which extent the written language was different from the ordinary speech. Most likely, since the access to writing was limited to a very small part of the society, the clay tablets tell us only about the sociolects of the scribal classes, and in a very restricted way.

Despite many attempts to find a language that would be related to Sumerian, it has not been possible to establish similarities with other languages. My own comparison with languages similar in terms of head-final and/or agglutinative typology, like Japanese, Quechua and Navajo, shows no useful syntactic resemblances.

[36] Diakonoff writes: "*In order to escape subjectivity in using the latter term, I shall define as 'archaic' any language which, on the lexical level, has no or only poorly developed means of expressing abstract ideas, and on the grammatical level, is based on the opposition 'action vs. state' (or 'transitive action' vs. 'Intransitive action and state')".*

On the other hand, we dispose of several grammars that describe the Sumerian language in a complete fashion, written and constantly improved by generations of Sumerologists and Assyriologists since the 18th century.

Armed with those grammars, we can apply modern linguistic concepts and analyse Sumerian with a generativist view.

The basic concepts I use in this work start with an axiomatic principle called *merge*, a concept elaborated inductively from a logical reasoning that attempts to describe the recursive combinatorial system the human brain uses for the construction of syntactic structures.

From the empirically established structures of the many languages of the world, we can understand some basic mechanisms and characteristics of *merge*, for example its fundamental asymmetry (asymmetric c-command) and the fact that syntax trees grow through *right branching* in all the attested languages.

Further rules can be deducted from cross-linguistic studies, like the parametric choice of order in the *merge* operations – that leads to head-initial or head-final constructions – and grammatical concepts such as selection, lexical specification, telicity and aspect.

Other necessary aids are generalised syntactic models such as the hierarchically organised chain of functional and lexical heads that all languages use (Cinque 1999), as well as particular mechanisms that only some languages use, like the system of applicatives that modify the valency of the verb.

On the semantic dimension, the concept of *event* is capital to understand what goes on inside the VP. Predicates are the description of events, which have a semantic structure that can be mapped to argument structure in syntax.

These relatively few tools – and the very fortunate existence of the invariable slot system of Sumerian – enabled the cartography of the verbal domain described in Section 5.3. In particular, the concept of applicatives has been essential to explain the verbal prefixes (an idea already proposed by Niedzielski 2017). And understanding that there is a link between event structure and argument structure has been the key to propose a solution to a puzzling mystery, characteristic of the Sumerian grammar: the alternations of cross-references to Subject, Agent and Patient between pre- and post-verbal positions.

Based on the above, we can answer the three questions I formulated in the beginning:

1. The constituents in Sumerian are arranged cartographically in a (SO/OS)V order. The Subject and the Objects form a nominal complex that includes case morphemes, indispensable for the identification of thematic roles, in a hierarchical chain. The SO complex appears in a high position, probably a Topic or Focus node, away from the usual subject and direct object positions close to the verb stem.

2. The prefixes appearing before the verb stem are of three types:
    a) Functional morphemes for negation, modality, finiteness, and voice. A coordination prefix, encountered rarely in the corpus, might be and adverb.
    b) Prefixes close to the verb stem:
        - First, a clitic ensuring agreement of person, gender and number of the objects listed in the SO complex with the first cross-reference to indirect objects in the prefix chain that follows.

        - Then, a chain of applicative morphemes that modify the valence of the verb and enable attribution of thematic roles to the event participants.
    c) A prefix contiguous to the verb stem is a cross reference to the ergative subject of perfective transitives. In imperfective transitives, this position is empty or occupied by a null morpheme that could be a cross reference to the absolutive or otherwise unmarked object. In intransitive clauses, which do not have a direct object, this position is empty.
- The suffixes following the stem are:
    d) A marker of imperfective aspect used only by Class 3 verbs.
    e) A cross-reference to either the absolutive Patient, in transitive perfective clauses, or else the Agent of imperfective transitives or the Subject of intransitives.

3. The mechanism of split ergativity obeys to the internal structure of the event being described by the verb phrase. In this structure, a Lower Aspect function, which includes a feature establishing whether the predication is telic or atelic, is responsible for the positioning of cross references to the Agent, Patient or Subject. If this feature is positive for telicity, [+ telic], ergative case is attributed to the prefix preceding the stem. Only perfective, telic verbs can attribute ergative case. If the telicity is missing, the Agent of transitive imperfective clauses is cross-referenced by a suffix appearing after the verb stem. Also, in intransitive clauses, which do not have an object and therefore do not include ergativity, the Subject is cross-referenced by this suffix.

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