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LANGUAGE CHANGE AND LINGUISTIC THEORY: THE CASE OF ARCHAIC INDO-EUROPEAN CONJUNCTION

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Abstract

Many archaic Indo-European languages exhibit a system of dual conjunction in which they possess both a head-initial exponent (e.g., Latin *et*) and an enclitic exponent (e.g., Latin *=que*). Mitrović (2014) and Mitrović & Sauerland (2016) argue that these two types of conjunctions instantiate the universal lexical categories J and μ. Several syntactic, semantic, and morphological properties are argued to result from this categorial distinction. For instance, J conjunctions are claimed to lack additive readings (i.e., 'too, also'). Diachronically, head-initial conjunctions are predicted to originate from combinations of J and μ heads (Mitrović & Sauerland 2016: 489). A closer look at the data reveals that neither of these predictions is borne out. The empirical motivation for the J/μ distinction is in fact paltry. I therefore offer a new history of Indo-European conjunction, in which I demonstrate first that the earliest attested Indo-European languages do not have this double system of conjunction. It is rather an innovation that resulted from the recruitment of new conjunctions across the family. These new conjunctions developed primarily from additive focus operators, and not from combinations of J and μ heads. Empirical issues aside, the analysis of Mitrović (2014) and Mitrović & Sauerland (2016) raises deeper questions about the relationship between linguistic theory and language change. I argue that some of the properties of natural language that Mitrović (2014) and Mitrović & Sauerland (2016) assign to Universal Grammar are better analysed as epiphenomena of language change.

1. Introduction

The archaic Indo-European languages are well known for their systems of double conjunction. Latin, for instance, has two primary conjunction morphemes, *et* and *=que* ('=' marks prosodic dependency; for more on Latin conjunction, see Kühner and Stegmann 1914: 3–37; Orlandini & Poccetti 2007; Torrego 2009):[1]

(1) *Latin conjunction strategies*

i.	tu	me	admonuisti	recte	**et**
	2SG.NOM	1SG.OBL	advise.2SG.PERF.ACT	properly	CONJ

[1] For extremely helpful criticism, I would like to thank two anonymous reviewers, James Clackson, Stephanie Jamison, Athena Kirk, Craig Melchert, Jeremy Rau, Jessica Rett, Julia Sturm, and Anthony Yates. Aaron Griffith, Brian Joseph, Dalina Kalluli, Bernhard Koller, Travis Major, Teigo Onishi, Georges-Jean Pinault, Christopher Stephens, and Conny van Scherpenberg kindly fielded questions during various stages of this study. All remaining faults are mine.

habeo gratiam
have.1SG.PRES.ACT gratitude.ACC.SG
'You have advised me properly **and** I am grateful.'

Plaut. *Men.* 1092

ii. arma virum=**que** cano
weapons.ACC.PL man.ACC.SG=CONJ sing.1SG.PRES.ACT
'I sing of arms **and** the man...'

Verg. *Aen.* 1.1

This pair of examples reveals the difference in surface distribution between *et* and *=que*. The former uniformly precedes its complement, whereas the latter is an enclitic that typically occurs after the first word of the second coordinand. Mitrović (2014) and Mitrović & Sauerland (2016) distinguish these two types of conjunctions by assigning enclitic conjunctions such as Latin *=que* to the lexical category μ and non-enclitic conjunction to the category J. They argue that these two classes differ not only in their syntax, but also in their semantics and morphology. More specifically, they claim that the following properties result from the J/μ categorial distinction:[2]

(2) i. *Semantics*
μ conjunctions are essentially quantifiers. J conjunctions lack quantificational readings.
ii. *Selectional restriction*
J and μ conjunction are in complementary distribution: the latter conjoins clauses, the former sub-clausal constituents.
iii. *Morphology*
J conjunctions are generally bimorphemic; μ conjunctions are generally monomorphemic.

These claims are beset by an array of empirical problems: there are J conjunctions that have quantificational readings, as well as μ conjunctions that lack them; in no archaic Indo-European language are J and μ conjunctions in complementary distribution; and J conjunctions are typically not bimorphemic. Simply put, there is far more diversity in the behaviour of conjunction morphemes than the analysis of Mitrović (2014) and Mitrović & Sauerland (2016) allows. Their synchronic account also obscures crucial syntactic changes that took place to create the double system of conjunction that we observe in Latin for instance.

I therefore offer a new account of conjunction in archaic Indo-European. The starting point of my analysis is the claim that the double system that is so robust across archaic Indo-European is actually an innovation. In the earliest attested archaic Indo-European languages (namely Hittite, Luvian, and Mycenaean Greek), we find only postposed conjunctions. The Indo-European languages underwent a remarkable series of parallel independent changes in which they recruited new conjunction morphemes. In most cases, the immediate diachronic precursor of these new conjunction morphemes was an additive focus marker.

The analysis of Mitrović (2014) and Mitrović & Sauerland (2016) raises a deeper question about the relationship between linguistic theory and language change. To account for the differences between enclitic and non-enclitic conjunction, their approach relies on the resources of Universal Grammar. I advocate a different approach, which does not locate the syntactic and semantic properties of head-initial and postposed conjunction directly in Universal Grammar. Properties such as the head directionality of conjunction and selectional restrictions on coordinands are instead epiphenomena of linguistic change. The head directionality of conjunction is inherited from its immediate diachronic ancestor. In archaic Indo-European, for instance, head-initial additives yield head-initial conjunctions and head-

[2] Many of the ideas in Mitrović 2014 appear in the more recent Mitrović 2018. Since the latter exists only in pre-publication form and is far less detailed than the earlier treatment, I typically cite Mitrović 2014.

final additives give rise to head-final conjunctions. In a similar vein, the selectional restrictions of conjunctions (that is, whether there are restrictions on the syntactic category of the second coordinand) often reflect the context in which they originally developed into conjunctions. Consequently, certain aspects of the synchronic behaviour of conjunction morphemes do not need to be directly encoded in Universal Grammar.

The remainder of this paper is structured as follows. Section 2 provides an overview of the surface conjunction strategies and exponents that are attested across archaic Indo-European. Section 3 presents the J/μ analysis of conjunction advanced by Mitrović (2014) and Mitrović & Sauerland (2016). Section 4 demonstrates that the predictions of their analysis are not borne out by the data. Section 5 offers a new history of archaic Indo-European conjunction, according to which most new conjunctions arose from additive focus quantifiers. Section 6 is devoted to the motivation and mechanics of this change. Section 7 argues for a symbiotic relationship between linguistic theory and language change. Section 8 offers brief concluding remarks.

2. Indo-European conjunction strategies and exponents

In example (1), I introduced two surface conjunction strategies. Several archaic Indo-European languages have a richer inventory of conjunction strategies at their disposal, including Latin itself:[3]

(3) *Conjunction strategies and their exponents in Latin*

i. *Head-initial*
ficos **et** oleas
fig.ACC.PL CONJ olive.ACC.PL
'figs **and** olives'
Cat. *De agr*. 42.1

ii. *Postposed*
bonum agricolam bonum=**que** colonum
good.ACC.SG farmer.ACC.SG=CONJ good.ACC.SG cultivator.ACC.SG
'a good farmer **and** a good cultivator'
Cat. *De agr*. Praef. 2

iii. *Mixed*
peregri=**que** **et** domi
abroad.LOC.SG=CONJ CONJ home.LOC.SG
'at home **and** abroad'
Plaut. *Amph*. 5

iv. *Double head-initial*
et iubeo **et** sino
CONJ command.1SG.PRES.ACT CONJ allow.1SG.PRES.ACT
'I **both** order **and** allow (you)'
Plaut. *Pers*. 189

v. *Double postposed*
atque id me sus=**que** de=**que** esse
CONJ DEM.ACC.SG 1SG.ACC up=CONJ down=CONJ be.PRES.INF.ACT
habituram putat
hold.PTCP.FUT.ACT.ACC.SG think.3SG.PRES.ACT
'And he thinks that I will consider this **both** up **and** down (= of no account).'
Plaut. *Amph*. 886

[3] By conjunction I mean specificially 'and'-words in contrast to other types of coordinating constructions (such as *but*, *moreover*, *however*, etc.). In general, I have used the descriptive terminology proposed by Haspelmath (2007: 50).

In example (3i), *et* precedes its complement *oleas* 'olives' and is therefore an example of head-initial conjunction.[4] The conjunction *=que* in example (3ii) is a second-position enclitic governed by 'Wackernagel's Law' (see, e.g., Hale 1987a; 1987b, Goldstein 2014; 2016a). On account of its second-position behavior, the conjunction is postposed, that is, its surface position lies within the second conjunct. So in example (3ii) *=que* occurs within the phrase *bonum colonum* 'a good cultivator'. Example (3iii) combines these two strategies with *=que* and *et* together meaning 'and' in the phrase *pergri=que et domi* 'at home and abroad'.[5] There are also two conjunction exponents in examples (3iv) and (3v). Here, however, the morphemes are identical. So *et iubeo et sino* in example (3iv) means 'I both order and allow you', while *sus=que de=que* in example (3v) means literally 'both up and down', but idiomatically something along the lines of 'of no account'.

Abstracting away from morphological exponence, the following inventory of surface patterns emerges ('co' abbreviates 'conjunction'; the asyndeton pattern is included here for completeness):[6]

(4) *Asyndetic*
A B

(5) *Monosyndetic*
A co_j B[7]
A B=co_i

(6) *Bisyndetic*
A=co_i B=co_i
co_j A co_j B
A=$co_{i\neq j}$ co_j B

2.1. Conjunction exponents

The following table presents the main conjunction exponents in the archaic Indo-European languages (S-AND and N-AND are used to describe conjunctions whose complements are restricted to clausal and sub-clausal constituents, respectively):[8]

[4] The head-initial conjunctions are thought to be (at least sometimes) proclitic. I abstract away from this property here, as it has no bearing on my analysis.

[5] This pattern is typologically uncommon (Dik 1968: 43–5; Haspelmath 2007: 10–1). It is worth noting that the A=co co B pattern contradicts the predictions of Jayaseelan (2014), whose analysis rules out this type of twofold surface realization of conjunction. In fact, most of the non-Anatolian archaic Indo-European languages pose a challenge to her parametric generalization, since they lexicalize both the concatenation operator (= the head-initial conjunctions above) as well as the choice-function operator (= the postposed conjunctions above). The account of Jayaseelan predicts that just one operator be lexicalized. The mixed strategy has other realizations, such as *et* A B=*que* in Latin, which I abstract away from here.

[6] Mitrović & Sauerland (2016: 481) remark that they are only aware of one Indo-European language, Southeastern Macedonian, that allows the pattern A=co co B=co. There is at least one attestation of this construction in Latin (Lucilius 111 Marx = 3 fr. 8 Charpin).

[7] Abbreviations such as 'A co B' are mere shorthand expressions for surface patterns of conjunction phrases. They should not be interpreted as statements of linear adjacency (i.e., that 'co B' must immediately follow 'A').

[8] This table takes no account of fossilized traces of conjunction morphemes, such as Hittite *takku* < **to-k*$^{\text{w}}$*e* (Watkins 1985: 492). Note in addition that this table only reports the most frequent head-initial conjunction in each language. So, e.g., Latin *atque* is not included because it is less frequent than *et*.

(7) *Conjunction exponents in archaic Indo-European*

Sub-group	Language	Postposed	Head-initial
Anatolian	Palaic	=*(i)a*? <*=*h_2o[9]	—
Anatolian	Hittite	=*(y)a* < *=*h_2o	—
	Hittite	=*(k)ku* < *=*k^we	—
Anatolian	Cuneiform Luvian	=*ḫa* < *=*h_2o	—
Anatolian	Hieroglyphic Luvian	=*ḫa* <*=*h_2o	—
Anatolian	Lycian A	—	*se*
Anatolian	Lycian B	=*ke* < *=*h_2o?	*sebe*
Anatolian	Carian	=*q* < *=*h_2o	*sb*
Anatolian	Lydian	=*k* (N-AND?) < *=*h_2o?	?
Tocharian	Tocharian A	=*śkaṃ*	*yo* (N-AND)
Tocharian	Tocharian B	=*spä*	*wai* (N-AND)
Indo-Iranian	Vedic Sanskrit	=*ca* <*=*k^we	*utá*[10]
Indo-Iranian	Pali	=*ca* < *=*k^we	*atha*
Indo-Iranian	Old Avestan	=*čā* < *=*k^we	*utā*
Indo-Iranian	Middle Persian	—	*'wd*
Greek	Mycenaean	=*qe* < *=*k^we	—
Greek	Attic-Ionic	=*te* < *=*k^we	*kaí*
Italic	Latin	=*que* < *=*k^we	*et*
Italic	Faliscan	=*cue* < *=*k^we	*et*[11]
Italic	Oscan	=**p**[12](S-AND?) < *=*k^we	**ínim**
Italic	Umbrian	=**p**[13](S-AND?) < *=*k^we	**et** (N-AND) **ene** (S-AND)
Baltic	Old Prussian	—	*be*
Baltic	Latvian	—	*un*
Baltic	Lithuanian	—	*ir̃*
Slavic	Old Church Slavic	—	*i*
Germanic	Gothic	=*(u)h* (S-AND) <*(u)=*k^we?[14]	*jah*
Germanic	Old High German	—	*unti*
Germanic	Old Saxon	—	*endi*
Germanic	Old Frisian	—	*and*
Germanic	Old English	—	*and*
Germanic	Old Norse	—	*ok*
Armenian	Classical Armenian	—	*ew*
Celtic	Old Irish	=*ch* (S-AND) < *=*k^we[15]	*ocus*
Celtic	Middle Welsh	—	*ac*

[9] I am at present agnostic on the question of whether the handful of examples of Palaic =*(i)a* should be analysed as conjunctions or additive focus operators. This issue has no bearing on my analysis.

[10] Vedic *utá* is predominantly head-initial, but also attested as a head-final conjunction. This issue is discussed below in Section 7.1.

[11] Faliscan *et* is only attested once. See Bakkum 2009: 303, 540.

[12] Following standard practice, I use boldface text for Oscan and Umbrian forms that are attested in the native writing systems. Oscan =**p** is attested among conjoined negated clauses (see *WOU*: 494–5). Given the paucity of data, it is not possible to determine whether its use was restricted to clausal constituents. James Clackson calls my attention to Sa 30 Rix (= Fagifvlae 3 Crawford; see further Benelli et al. 2008), where Pisani restored an enclitic conjunction =**pe**. If correct, this would be an example of =**p** conjoining noun phrases.

[13] As with Oscan =**p**, Umbrian =**p** is attested with conjoined negated clauses (see *WOU*: 494–5). There are not enough examples of the conjunction =**p** to be able to decide whether it was used exclusively as a clausal conjunction.

[14] See Wilson 2017: 523 for an overview of the debate surrounding the etymology of Gothic =*(u)h*.

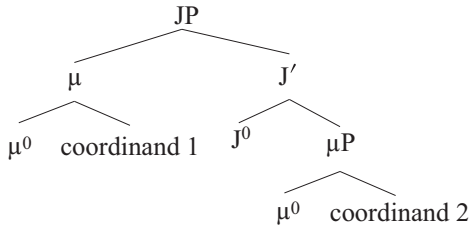
[15] See Thurneysen 1921: 299–300.

Celtic Celtic	Celtiberian Gaulish	*=kue* < **=k*^{w}*e* —	*ekue*? *etic*
Albanian	Albanian	—	*e*
?	Venetic	*=kve* < **=k*^{w}*e*	*ke*
?	Phrygian	*=ke* < **=k*^{w}*e*	*akke*?
?	Messapic	*=θi* < **=k*^{w}*e*	?

3. The J/μ analysis of Indo-European conjunction

Mitrović & Sauerland (2016) and Mitrović (2018) argue that all archaic Indo-European languages exhibit a twofold system of conjunction parallel to that observed in Latin in example (1) above.[16] The Juncture Phrase of Den Dikken (2006) underlies their analysis:

(8) *Juncture phrase*



According to their analysis, conjunction morphemes belong either to the category J or the category μ. In example (7) above, head-initial conjunctions (such as Sanskrit *utá*) are predicted to be J heads, whereas postposed conjunctions (such as Sanskrit *=ca*) belong to the category μ. Mitrović (2014) and Mitrović & Sauerland (2016) argue that J and μ conjunctions differ in their morphology, syntax, and semantics.

Perhaps the most perspicuous difference between J and μ conjunctions lies in their alleged selectional restrictions. The former are said to conjoin clauses, while the latter are said to be restricted to sub-clausal constituents. In the following example, Sanskrit *=ca* conjoins two noun phrases:

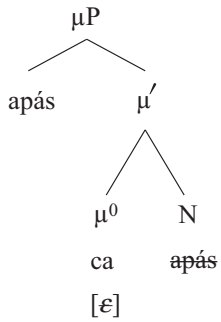
(9) *NP-conjunction*
ájanayan mánave kṣā́m apáś**=ca**
create.IMPF.ACT.3SG Manu.DAT.SG earth.ACC.SG water.ACC.SG**=*μ***
'For Manu he created earth **and** water.'

RV 2.20.7c

Mitrović (2014) derives this postposed surface behavior of *=ca* from an underlying head-initial configuration. He postulates an EPP-like feature [*ε*], which induces movement of the closest syntactic terminal to the left of the conjunction:

[16] Mitrović (2014: 150), however, notes that the double system is not found in Albanian or Classical Armenian.

(10) *Movement of second conjunct*



The noun *apás* is first merged with μ then then moves up to Spec,μP to check the [ε] feature on μ^0. At PF, *=ca* incorporates prosodically with *apáś* to its left, which results in the string *apáś=ca* at spell-out.[17]

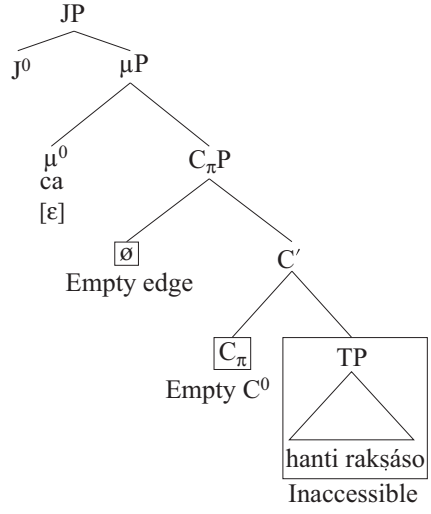
When the conjuncts are CPs, however, μ conjunctions run into a problem. The feature [ε] can only be checked by heads. Since CPs are phases, they block the head movement necessary to check [ε]. Consider the following clause:

(11) hanti rakṣáso
slay.PRES.ACT.3SG demon.ACC.PL
'(He) slays the demons.'

RV 5.83.2a

Were *=ca* to occupy μ^0 in example (12), the derivation would crash because there is no accessible head that can check its [ε] feature. On the assumption that the sentence in example (11) is a TP, both C^0 and Spec,CP are empty. Since CP is a phase, the TP itself is inaccessible to μ^0. The following tree summarizes the conundrum:

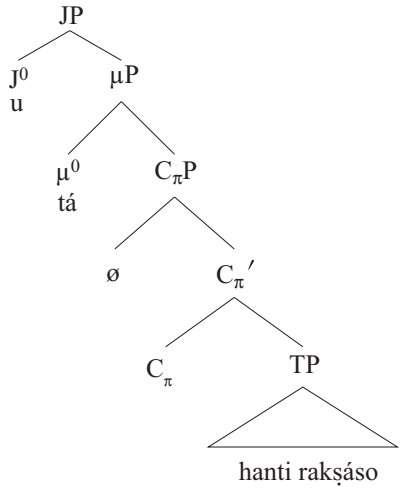
(12) *The problem with μ^0 and $C_\pi P$*



[17] This mechanism is not adequate to capture the surface distribution of second-position conjunctions in Greek, Latin, or Sanskrit. Discussion of this topic lies beyond the scope of this paper, however. For a recent analysis of the distribution of second-position clitics and the syntax-phonology interface, see Goldstein & Haug 2016.

This scenario triggers a 'last resort' mechanism, whereby a J^0 checks the [ε] feature on μ^0 and thereby keeps the derivation from crashing:

(13) *Last resort: overt* J0



Mitrović compares expletive subjects that serve as a last resort in, e.g., *It is raining*. The result of this last resort mechanism is the following sentence:

(14) μ^0 *incremented by* J^0
u-tá hanti rakṣáso
J-μ slay.PRES.ACT.3SG demon.ACC.PL
'He slays the demons.'

RV 5.83.2a

The J head saves the derivation by checking the [ε] feature of the μ^0 conjunction *=ca*. As a result of this 'last resort' operation, we end up with a bimorphemic clausal conjunction composed of a J head and a μ head.

The derivation in example (13) is faulty, however, because the form that the analysis predicts is **uca*, which does not exist. The last resort mechanism should simply supply a J head that checks the [ε] feature of the μ^0 conjunction *=ca*. This is not what happens, however. The conjunction *=ca* is supplanted by *-tá*. There is nothing in Mitrović's analysis that licenses the replacement of *=ca* with *-tá*, however.

The proposed syntax for J and μ conjunctions makes the following predictions about their morphological composition (Mitrović 2014: 82–5; Mitrović & Sauerland 2016: 488):

(15) i. μ conjunctions are monomorphemic.
ii. J conjunctions are bimorphemic.[18]
iii. J conjunctions can be decomposed into J and μ heads. (cf. Szabolcsi 2015).

As predicted, μ conjunctions such as Latin *=que* and Sanskrit *=ca* (which both continue **=k^{w}e*) and Hittite *=(y)a* are monomorphemic. Likewise, the Sanskrit J conjunction *utá* can be

[18] Mitrović (2018: 31) tempers this claim by saying that J conjunctions are 'generally' bimorphemic and μ^0 conjunction are 'generally' monomorphemic.

decomposed into *u-* and *-tá*. Although these forms bear out the predictions of (15), we will see below in Section 4 that most J conjunctions do not.

Finally, we come to the semantic differences between J and μ conjunctions. Mitrović (2014: 86) and Mitrović & Sauerland (2016: 471–2) assert that μ conjunctions bundle together universal quantification, negative polarity, additivity, and conjunction. Japanese *=mo* is presented as the parade example of this category (the data and glosses are from Mitrović & Sauerland 2016: 471–2):

(16) *Universal quantification*
 i. dare=**mo** wakaru
 who-μ understand
 '**Everyone** understands.'
 ii. dono gakusei=**mo** wakaru
 INDET student-μ understand
 '**Every** student understands.'

(17) *Negative polarity*
 i. dare=**mo** wakarimas-en
 who=μ understand-NEG
 'No one (= not **anyone**) understands.'
 ii. dono gakusei=**mo** wakarimas-en
 INDET student=μ understand-NEG
 'No student (= not **any** student) understands.'

(18) *Additive*
 Mary=**mo** wakaru
 Mary=μ understand
 '**Also** Mary understands.'

(19) *Conjunction*
 Mary(=**mo**) John=**mo** wakaru
 Maru=μ John=μ understand
 '(**Both**) Mary **and** John understand.'

J conjunctions are said to lack all of these readings. English *and* is offered as a representative illustration of J conjunction (Mitrović & Sauerland 2016: 481). Thus, Japanese and English are the paragons of μ-type languages and J-type languages, respectively (Mitrović & Sauerland 2016: 491).

4. The illusion of uniformity

The above analysis of Mitrović and Sauerland makes the following predictions about the syntax and semantics of J and μ conjunctions:

(20) J-type conjunction (Mitrović & Sauerland 2016: 481)
 i. Conjoins propositions
 ii. Cannot be doubled
 iii. Cannot have quantificational readings
 iv. Cannot have additive readings

(21) μ-type conjunction (Mitrović & Sauerland 2016: 481)
   i. Conjoins NP/DPs and cannot conjoin propositions (Mitrović & Sauerland 2016: 477)
   ii. Can be doubled
   iii. Can have quantificational readings
   iv. Can have additive readings
   v. When doubled, cannot have a collective interpretation (Mitrović & Sauerland 2016: 478)

As we will see, their analysis predicts far more homogeneity among both types of conjunctions than is actually attested.

To begin with the most obvious issue, there are only a few examples of conjunctions that exhibit the category restrictions in examples (20i) and (21i). The only J conjunction that is limited exclusively to propositional conjunction is Umbrian **ene**. The only conjunctions that are restricted to NPs are Tocharian A *yo*, Tocharian B *wai*, and Umbrian *et* (and perhaps Lydian *=k*). In both Gothic and Old Irish, the μ conjunctions *=(u)h* and *=ch* are only attested as clausal conjunctions.[19] All remaining conjunctions conjoin both sentential and sub-clausal constituents. (The selectional constraints of these conjunctions is discussed in greater detail in Section 7.2 below.)

According to the analysis of μ conjunction in Section 3 above, reflexes of **=k^{w}e* can only conjoin NPs and not clauses. This is empirically wide of the mark, however. With the exceptions of Old Irish *=ch* and Gothic *=(u)h* just mentioned, postposed conjunctions in archaic Indo-European exhibit a selectional *bias* for sub-clausal constituents, but they can also conjoin clauses (e.g., Gonda 1954; 1957; Dunkel 1982; 2014: 689, 694; Klein 1992: 2, 7, 10; Goedegebuure 2014: 436–7, 443–4), as revealed by the following quantitative data from Homeric Greek and Vedic Sanskrit:[20]

(22) *Frequency of conjoined clauses and sub-clausal constituents* (Klein 1992: 2, 11)

Language	Conjunction	Sub-Clausal	Clausal
Vedic Sanskrit	*=ca*	902	91
	utá	380	320
Homeric Greek	*=te*	69	5
	kaí	26	37

The data reveal that the behavior of head-initial and postposed conjunctions is a usage property, not a grammatical property. Contrary to the account of Mitrović (2014) & Mitrović & Sauerland (2016), head-initial and postposed conjunction are not in complementary distribution. None of the alleged μ conjunctions in archaic Indo-European fully parallel Japanese *=mo* or Malayalam *-um*, two μ conjunctions that cannot conjoin clauses (Mitrović & Sauerland 2016: 472, 476).

Turning to J conjunction, there are cases where it can both be doubled and used as an additive, contra predictions (20ii) and (20iv). Latin *et* is one such case:

[19] This is also true for Oscan **=p** and Umbrian **=p**, but as noted in the table in example (7), this may be due to the paucity of data.

[20] The numbers for Vedic Sanskrit are based on the entirety of the *Rigveda*, whereas those for Greek come from the first 610 lines of book one of the *Iliad*.

(23) i. *Additive* J

inponit	finem	sapiens	**et**	rebus	honestis.
impose.3SG.PRES.ACT	limit.ACC.SG	wise.NOM.SG	ADD	things.DAT.PL	honest.DAT.PL

'The wise person places a limit **even** on honest pursuits.'

Juv. 6.44

ii. *Doubled head-initial*

et	iubeo	**et**	sino
CONJ	command.1SG.PRES.ACT	CONJ	allow.1SG.PRES.ACT

'I **both** order **and** allow (you)'

Plaut. *Pers.* 189

Doubling of a J conjunction can also be found in a number of other languages, such as with ancient Greek *kaí*, Vedic Sanskrit *utá* (Klein 1985: 354–9), Gothic *jah* (Matthew 10:28; John 7:28), and Albanian *(e)dhe* (Dalina Kallulli, p.c.). Example (58) in the Appendix provides a range of additional cases in which additive semantics are found with a J conjunction. Mitrović (2014: 149) acknowledges the doubling problem (but not the additivity problem) and deals with it by assigning Latin *et* to yet another lexical category, η. He does not provide a full analysis of this category, however, and nothing is said about it in Mitrović & Sauerland 2016.

The claim that head-initial conjunctions can be decomposed into J and μ heads, which falls out from the syntactic analysis illustrated above in example (13), is also wide of the mark. Most J conjunctions are in fact monomorphemic:

(24) *Monomorphemic J conjunctions*

i. Albanian *e*
ii. Albanian *dhe*
iii. Classical Armenian *ew*
iv. Greek *kaí*[21]
v. Latin *et*
vi. Lithuanian *ĩr*
vii. Lycian *se*
viii. Middle Persian *'wd*
ix. Old Church Slavic *i*
x. Old High German *ja*
xi. Old High German *unti*
xii. Old Norse *ok*
xiii. Old Prussian *bhe*
xiv. Tocharian A *yo*

Although the following examples are bimorphemic, none of them can be confidently decomposed into a J and a μ morpheme:[22]

(25) *Bimorphemic J conjunctions*

i. Albanian *edhe* < *e-dhe* (*AED*: 85–6)
ii. Gaulish *etic* < **éti-k^{w}e* (*LEW*: 1.421; *WOU*: 240; Delamarre 2003: 167–8; Dunkel 2014: 263)

[21] The bimorphemic analysis of this conjunction advanced by Mitrović & Sauerland (2016: 488) is not only incorrect but is also not to be found in the scholarship that they cite in support of their analysis.

[22] It is perhaps the case that Tocharian A *=śkaṃ* and Tocharian B *=spä* continue bimorphemic sequences. The identity of the constituent morphemes is anything but clear, however.

iii. Gothic *jah* < *ja-(u)h* < **yo=k^{w}e* (Lehmann 1986: 210)
iv. Gothic *jau* < **yó-h$_2$i/u* (Dunkel 2014: 348)
v. Latin *atque* < **at-k^{w}e* (Dunkel 1980; Goldstein 2018)
vi. Vedic Sanskrit *utá* < **h$_2$u-té* (Dunkel 2014: 337)

Albanian *e-dhe* in example (25i) is formed from two conjunctions, but not from a combination of a J head and a μ head. In examples (25ii), (25iii), and (25v) one of the constituent morphemes is indeed **=k^{w}e*, but there is no evidence that the other morpheme was a J head at the time the conjunction was formed. Among the remaining morphemes in the above list, none can be characterized as conjunctions with any confidence.

Finally, there is one head-initial conjunction that appears to be formed from an erstwhile collocation. Griffith (2009) argues that the Old Irish conjunction *ogus* continues the following pre-Irish string:

(26) *The precursor of Old Irish conjunction*
oc(c)o as
by.it.3SG.NEUT 3SG.PRES.REL.COP
'Beside that which is'

The form *oc(c)o* is a conjugated form of the preposition *oc* 'by' and *as* is a relative form of the copula. Together they yield the paraphrase 'beside that which is'. One could perhaps make the argument that *ogus* is bimorphemic, but like the conjunctions in example (25) it did not originate in the combination of a J morpheme with a μ morpheme.

Turning to semantics, the predictions for μ conjunctions in example (21) are upset in various ways. First, Tocharian A *yo* and Tocharian B *wai* are NP-conjunctions that lack both quantificational and additive semantics. According to the semantics that Mitrović & Sauerland (2016: 480) assign to μ, when μ is doubled, the conjoined phrase should not be compatible with collective interpretations of predicates (Mitrović & Sauerland 2016: 473, 478, 480). This prediction is not borne out:

(27) índraś=**ca** yád yuyudháte áhiś=**ca**
Indra.NOM.SG=CONJ COMP fight.3SG.PERF.MID serpent.NOM.SG=CONJ
'When Indra **and** the serpent fought…'
RV 1.32.13c (Klein 1985: 131)

Crucially, the predicate 'fight' here is used in a reciprocal sense: Indra and the serpent fight one another and not some other entity. By contrast, Mitrović & Sauerland (2016: 480) predict a distributive reading.

Finally, J heads are predicted not to occur in quantifiers, but in fact this does happen. As Mitrović (2014: 91) himself notes, head-initial conjunction in Bosnian/Serbian/Croatian does show up in quantifiers:

(28) *Bosnian/Serbian/Croatian*
i. *Head-initial conjunction*
Ivan **i** Ana rade
Ivan CONJ Anna work
'Ivan and Anna are working.'
ii. *Indefinite pronouns* (Willis 2013: 393)
*****i****-tko* > ***i****-ko* 'anyone'
i*-šta* 'anything'

Mitrović (2014: 91) handles this problem by designating *i* a μ conjunction. His motivation for this analysis is not presented in detail, but appears to be the fact that Bosnian/Serbian/

Croatian lacks μ conjunction. Since the language has only one conjunction exponent, it apparently takes on the properties of both J and μ. In itself, this reasoning is unproblematic. Within the context of his larger analysis, it creates serious problems, however. For instance, English is also a language with a single conjunction exponent, but it is a centrepiece of the analysis of Mitrović & Sauerland (2016) that it exhibit strictly J-type properties.

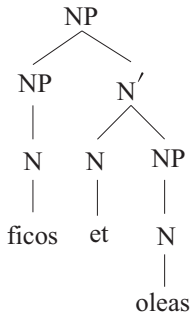
The preceding array of empirical problems makes it clear that the fundamental problem facing the analysis of Mitrović (2014) and Mitrović & Sauerland (2016) is that lexicons are language-specific entities. The universal categories J and μ are simply not fine-grained enough to capture the diversity that we find in the behavior of conjunctions in archaic Indo-European.[23] I therefore see no motivation for the view that head-initial and postposed conjunction differ in lexical category.

4.1. The lexical category of conjunction

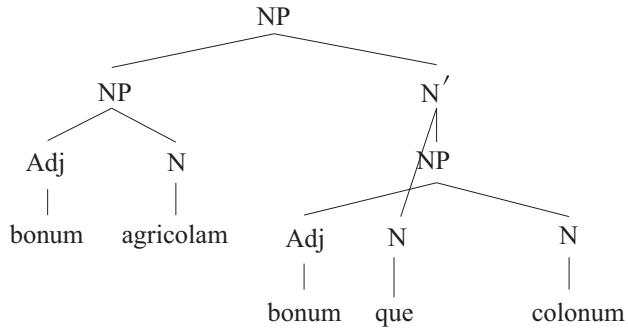
I follow Zhang (2010) in the view that cross-categorial conjunctions actually lack categorial content altogether.[24] So examples (3i) and (3ii) from above have the following structures:

(29) *Conjunction without categorial content*

i. *Head-initial conjunction*



ii. *Postposed conjunction*



[23] It may be possible to parameterize conjunction morphemes with a more fine-grained inventory of parameters. This is a question that lies beyond the scope of the current investigation, however.

[24] Conjunctions that exhibit c-selectional restrictions do possess intrinsic categorial content. E.g., DP-conjunctions are assigned to the category D (Zhang 2010: 57–9).

The external conjuncts (*ficos* in example 29i, *bonum agricolam* in example 29ii) of the conjoined noun phrases determine the category of the entire phrase (Zhang 2010: 56). The represenation of postposed conjunction in example (29ii) makes use of the multiple-context free grammar analysis advocated by Goldstein & Haug (2016). Nothing in the remainder of the analysis depends on this category-less view of conjunction or this particular analysis of postposed conjunction, however.

I agree with Mitrović (2014) that conjunction in archaic Indo-European is binary branching. In Sanskrit (e.g., Klein 1985: 52, 58, 298–9, 301, 317), Greek (Devine & Stephens 1999: 157–61; Agbayani & Golston 2010a: 143–5), and Latin (Devine & Stephens 2006: 410–1, 568–70, 586–91; Agbayani & Golston 2016: 13–4), evidence for this view comes from violations of the Coordinate Structure Constraint (Ross 1967):

(30) i. *Sanskrit*
bṛ́haspate yuvám índraś≠ca vásvo
Bṛhaspati.VOC.SG 2PL.NOM Indra.NOM.SG≠CONJ treasure.GEN.SG
divyásya_īśā́the **utá** pā́rthivasya
divine.GEN.SG_rule.2PL.PRES.MED CONJ earthly.GEN.SG
'Bṛhaspati and Indra, you rule the heavenly **and** earthly treasure.'
RV 7.97.10ab

ii. *Greek*
ourẽ:as mén prõ:ton epó:ik^{h}eto **kaì** kúnas argoús
mule.ACC.PL PTCL first.ACC.SG assail.3SG.IMPF.MED CONJ dog.ACC.PL swift.ACC.PL
'He first assailed the mules **and** the swift dogs.'
Hom. *Il.* 1.50

iii. *Latin*
ibi cacumina populorum serito **et** harundinetum
there tops.ACC.PL poplar.GEN.PL plant.IMPV CONJ reed.bed.ACC.SG
'Plant poplar tops **and** a reed bed there.'
Cato 6.3

These examples all violate the conjunction condition of the Coordinate Structure Constraint, which forbids movement of a coordinand out of a conjoined phrase (Zhang 2010: 3). So in example (30iii), *cacumina populorum* 'poplar tops' is not adjacent to *et harundinetum*. Violations of the conjunction condition are always asymmetric. Although it is possible for the first and second conjuncts to be non-adjacent, the second coordinand must immediately follow the conjunction (as illustrated by the examples in 30). In other words, the first coordinand can move out of the conjoined structure, but the second cannot. I interpret this asymmetry as evidence for the binary-branching structures in example (29).

Although J and μ are alleged synchronic categories, their removal has critical diachronic consequences, since Mitrović (2014: 85) locates the origin of head-initial conjunctions in combinations of of J and μ conjunctions (as illustrated for Sanskrit *utá* in example 13 above). Without such particles, a new source for head-initial conjunction must be identified. In Section 6, I argue that this source was predominantly additive focus quantifiers. Before addressing the rise of head-initial conjunction, a number of points about the diachrony of conjunction in archaic Indo-European need to be clarified.

5. A new history of Indo-European conjunction

The first thing to establish is that not all archaic Indo-European languages exhibit the double system of conjunction found in Latin. As the table in example (31) below reveals, some

archaic Indo-European languages—foremost among them Hittite and Mycenaean Greek—lack head-initial conjunction:[25]

(31) *Conjunction strategies in archaic Indo-European*

	INVENTORY	LANGUAGE
Type 1	A B=co	Hittite, Luvian, Mycenaean Greek (Palaic?, Messapic?)[26]
Type 2	A B=co$_i$, A co$_j$ B	Vedic Sanskrit, Pali, Old Avestan, Alphabetic Greek, Latin, Oscan, Umbrian, Venetic, Lycian B, Carian, Tocharian A, Tocharian B, Gothic, Old Irish (Celtiberian?, Phrygian?)
Type 3	A co B	Old English, Old High German, Old Saxon, Old Norse, Old Frisian, Middle Welsh, Classical Armenian, Old Prussian, Latvian, Lithuanian, Albanian

There is a correlation between time depth and conjunction system. The Type 1 languages, Hittite, Luvian, and Mycenaean Greek, are the Indo-European languages with the earliest textual attestation. Crucially, there is no evidence for head-initial conjunction in these languages (see, e.g., Ruijgh 1971: §15).

There is some question of how to interpret the absence of head-initial conjunction in Mycenaean. The pre-form of the head-initial conjunction in alphabetic Greek, *kaí*, is thought by many to be the comitative adposition **kṃti* (for further details, see the Appendix). One way to derive *kaí* from **kṃti* is via metathesis followed by loss of the final stop: **kṃti* > **kati* > **kait* > *kaí* (Kiparsky 1967: 132–3). The loss of word-final stops in Greek is an early sound change, so under this analysis the pre-form of *kaí* has to antedate the Linear B texts.[27] That is, the form *kaí* itself has to exist at the time of Mycenaean. One could then argue that the absence of head-initial conjunction in Mycenaean is simply an accident. Although there are about five thousand Linear B texts extant, they are by and large very short and confined to administrative records.

My objection to this analysis is that there is no shortage of the postposed conjunction *-qe* in the Mycenaean texts. So if *kaí* had already developed into a conjunction by the time these texts were composed, we should see it in the texts. Although the form *kaí* itself came into existence at an early stage of Greek (i.e. before the Mycenaean period), its use as a conjunction did not. As Ruijgh (1966: 204) contends, *kaí* is unattested in Mycenaean because at that time it was still an additive (and not yet a conjunction), and there was no need for additives in administrative records.[28]

[25] This taxonomy abstracts away from selectional restrictions, i.e., if a conjunction is restricted to clausal or subclausal conjuncts. It also takes no account of whether or not a language allows the mixed type of conjunction introduced in example (3iii) above.

[26] It is possible that one could add the very earliest Latin to this group. In the *suovetaurilia* prayer, the language of which is agreed to be extremely archaic, there are thirteen tokens of conjunction, all of which are postposed (see Elmer 1887: 293–4. Likewise, the only conjunction used on the Columna Rostrata (260 BCE) is *=que* (*CIL* VI 31611; Lindsay 1894: 599, cf. Watkins 1963: 8–9).

[27] I am grateful to Jeremy Rau for calling my attention to these details.

[28] Willi (2003) asserts that *kaí* was originally a clausal conjunction and attributes the absence of *kaí* in Mycenaean to the nature of the texts. In support of his claim, he advances Homeric examples of *kaí* that are alleged to exhibit a pre-conjunction meaning (Willi 2003: 239–40). Willi characterizes this archaic meaning of *kaí* as an adverb 'folglich, somit' and postulates a change to 'auch, und'. The conjunction would have been specifically a sentential conjunction. This analysis is untenable because it maintains that *kaí* turned into an additive and a conjunction at the same time. Moreover, I see no reason to think that the precursor of *kaí* was exclusively a sentential conjunction at any stage of Greek.

The Type 2 languages, which have both postposed conjunction and head-initial conjunction, are attested in a slightly later chronological layer. The loss of postposed conjunction then yields the Type 3 languages, which like English and the Indo-European languages of contemporary Europe, have exclusively head-initial conjunction. Some modern Indo-European languages, such as Romanian and Hindi, have even renewed the head-initial exponents inherited from antiquity. The Romanian conjunction *şi* (< Latin *sic* 'thus, so'), for instance, has replaced the Latin conjunction *et*, continuants of which are otherwise found in Romance.

Putting all this together, we end up with the following trajectory:[29]

(32) *Diachronic trajectory*
Type 1 > Type 2 > Type 3

In other words, Proto-Indo-European is a Type 1 language.[30] Most languages then acquire head-initial conjunction (the exceptions being Palaic, Hittite, and Luvian). Once postposed conjunction is lost, we end up with the Type 3 languages.

The analysis of Mitrović (2014) & Mitrović & Sauerland (2016) fails to establish the trajectory in example (32) because they use a permissive definition of conjunction (which they appear to have taken over from Agbayani & Golston 2010b). As a result, their inventory of conjunction exponents includes more lexemes than the one in example (7) above. The most important difference concerns Hittite *nu* (for a recent analysis of which, see Widmer 2016), which they classify as a head-initial conjunction (Mitrović 2014: 77):[31]

(33) kalulupi=šmit=ašta išg[(ara)]nta dāi
finger.INSTR.SG=3PL.POSS.INSTR.SG=PTCL fasten.PTCP.NEUT.PL take.3SG.PRES.ACT
[n]=e=n kiššari=šmi dāi
NU=3SG.ACC.PL=PTCL hand.DAT-LOC.SG=3PL.POSS.DAT-LOC.SG put.3SG.PRES.ACT
n=ašt[(a pa)]rā paiwani.
NU=PTCL forth go.1PL.PRES.ACT
'He takes the things fastened to their fingers. NU he puts them in their hands.
NU we leave.'

KBo 17.1 i 19–20 (OS) (Hoffner & Melchert 2008: §29.6)

This passage illustrates typical properties of *nu*: it does not occur discourse initially; it only takes clauses as complements; and when it takes a root clause as its complement, it moves the narrative forward temporally (cf. the narration relation in Asher & Lascarides 2003: 162–5).[32]

In the example above, *nu* occurs in the second and third sentences, but not in the first. The second sentence is temporally located after the first and prior to the third. Given these properties, *nu* prima facie looks like it could just be a clausal conjunction. The particle cannot, however, be equated with conjunction because it is semantically stronger than conjunction. Consider the following example:

(34) Jenny went home and Mark won the lottery.

[29] Although the Tocharian languages can be categorized in the above system, it should be noted that their histories differ from that of all other archaic Indo-European languages. Tocharian A and B grammaticalized both new head-initial and postposed conjunctions. This happened in no other attested archaic Indo-European language.

[30] For what it is worth, head-final conjunction is robustly attested across the Caucasian languages.

[31] Mitrović (2014: 84, 97–8, 141–2) also interprets Mycenaean *-de* and alphabetic Greek *=dé* as conjunctions. These are better analysed as topic markers (Goldstein 2016a: 7 n. 11, 121–74).

[32] Hittite *ta* and *šu* are syntactically and semantically similar to *nu*, but they come with the further requirement that they can only be used with certain tenses. By the time of New Hittite, *nu* does not always advance the reference of a narrative; it can also be used for logical progression. I am grateful to Craig Melchert for bringing this development to my attention.

This sentence can denote a situation in which Jenny first goes home and Mark then wins the lottery or vice versa. It is precisely this freedom that *nu* lacks. To label *nu* a conjunction is therefore misleading because it fails to acknowledge the differences that separate *nu* from conjunction. A more accurate paraphrase of this particle would be the adverb 'then'. In sum, there is no head-initial conjunction in Hittite (or Palaic or Luvian).[33]

5.1. Proto-Indo-European as a Type 1 language

Were we to reconstruct both head-initial and postposed conjunction to Proto-Indo-European, we would face two significant problems. The first is that Anatolian and Greek would be saddled with contorted histories. In the former, we would have to assume that head-initial conjunction was lost and that the postposed exponent *=$k^{w}e$ was replaced by *=h_2o. In Greek, we would have to assume that head-initial conjunction was lost at some point in the course of its history only to reappear in the earliest alphabetic texts. In both scenarios, the pace of the changes is at odds with the long lifespan of conjunctions that we observe elsewhere in Indo-European (e.g., reflexes of Latin *et* are still present in most Romance languages). Methodologically, this reconstruction also violates the principle of parsimony, according to which the account that posits the fewest changes to account for the attested data should be preferred. If we start with a system that had only postposed conjunction, languages with head-initial conjunction undergo just one change, namely the grammaticalization of head-initial conjunction (as opposed to two changes, i.e. both the loss and re-appearance of head-initial conjunction).

The second problem is that, among the head-initial conjunctions, there are no cognates across sub-groups. That is, each branch of Indo-European (e.g. Indo-Iranian, Greek, Italic, Germanic, Celtic, etc.) has recruited a different head-initial conjunction morpheme.[34] If Proto-Indo-European (PIE) had head-initial conjunction, we would expect to see inherited forms of head-initial conjunction preserved in more than one clade.

Having established that PIE was a Type 1 language,[35] we come now to the question of which postposed conjunction exponent should be reconstructed to Proto-Indo-European. There is robust comparative evidence to reconstruct *=$k^{w}e$ as the sole conjunction morpheme of Nuclear Proto-Indo-European (cf. Hettrich 1988: 260, Mallory & Adams 2006: 62, 421–2, Dunkel 2014: 344). Whether or not one can project this exponent back further depends on how one evaluates the Hittite evidence.

Watkins (1985) argues that traces of the conjunction =*(k)ku* < *=$k^{w}e$ can be ferreted out in Hittite (see also Puhvel 1997: 203–4, EDHIL: 483–4). The clearest example is perhaps the following:

(35) [n=aš] ēšzi=pat natta=**ku**w[=aš=apa ar]āi
NU=3SG.NOM sit.3SG.PRES.ACT=FOC NEG=CONJ=3SG.NOM=PTCL get.up.3SG.PRES.ACT
'She remains seated **and** she does not get up.'

KBo 19.163 ii.33′–34′ (NH)

[33] Even if one were to admit *nu* as a conjunction, this would not justify the reconstruction of head-initial conjunction for Proto-Indo-European. This is because Hittite *nu* has to be an innovation. Furthermore, it would be an innovation that is not shared with any other sub-groups. So even on an analysis in which Hittite acquires head-initial conjunction, the reconstruction of head-initial conjunction for Proto-Indo-European still lacks motivation.

[34] The only potential exception to this generalization is Albanian *e*. If this form is inherited and continues **éti* (as suggested by Matzinger 2006: 159–60), then Albanian and Italic would have recruited the same morpheme for conjunction. The grammaticalization of **éti* into a conjunction would have taken place separately in Latin and Albanian. Given the number of Latin loanwords in Albanian, however, it seems more likely that Albanian *e* was borrowed from Latin. Within Indo-European, Latvian *un* was borrowed from Germanic. On the borrowing of conjunctions, see further Campbell 1987, Matras 1998, and Hildebrandt 2007: 294.

[35] Dunkel (1982; 1983: 181) reconstructs several conjunction morphemes to (Pre-)Proto-Indo-European, many of which are extremely speculative. Since a full treatment of his claims would take us too far afield, I leave this for future work.

The string *natta≠ku* means 'and not'. Strings of negation plus a reflex of *$*≠k^we$* are robustly attested across archaic Indo-European and include Sanskrit *na≠ca*, Latin *neque*, and Old Irish *nach*. The behavior of *≠ku* in this passage thus parallels the behavior of reflexes of *$*≠k^we$* attested elsewhere. Although the attestation of reflexes of *$*≠k^we$* as a conjunction in Anatolian are scant, they are nevertheless present. With this piece of evidence, we can then reconstruct a conjunction *$*≠k^we$* to Proto-Indo-European with a reasonable degree of confidence.[36]

6. The rise of head-initial conjunction

I demonstrated in Section 4 above that, contra the account of Mitrović (2014) and Mitrović & Sauerland (2016), the innovative head-initial conjunctions do not originate in combinations of two conjunction morphemes, let alone in combinations of J and μ heads. The question then arises of where the new conjunctions came from. Haspelmath (2007: 10) suggests that the most common diachronic sources of conjunction are additives and comitatives (cf. König 1991: 1; Berg 2004: 217), a view that the Indo-European data support:

(36) *Diachronic precursors of conjunction*[37]

Sub-group	Language	Conjunction	Precursor
Indo-Iranian	Vedic Sanskrit	*utá*	Additive
Greek	Greek	*kaí*	Additive
Italic	Latin	*et*	Additive
Baltic	Old Prussian	*be*	Additive
Baltic	Lithuanian	*ir̃*	Additive
Slavic	Old Church Slavic	*i*	Additive
Germanic	Old Norse	*ok*	Additive
Armenian	Classical Armenian	*ew*	Additive
Celtic	Old Irish	*ocus*	Additive
Germanic	Gothic	*jah*	Additive+Conjunction
Celtic	Gaulish	*etic*	Additive+Conjunction
Italic	Oscan	**ínim**	Additive?
Italic	Umbrian	**ene** (s-and)	Additive?
Germanic	Old High German	*unti*	Additive?
Tocharian	Tocharian A	*yo* (n-and)	Comitative
Tocharian	Tocharian B	*wai* (n-and)	Two
Baltic	Latvian	*un*	Borrowing
Albanian	Albanian	*e*	Borrowing?
Indo-Iranian	Pali	*atha*	?
Anatolian	Lycian B	*sebe*	?
Celtic	Celtiberian	*ekue*?	?

Examples documenting the additive behavior of these conjunctions are provided in the Appendix. Here I will limit myself to an illustrative example from Latin, where *et* is also used as an additive:

[36] There is a considerable amount of debate about whether this conjunction is in some way related to the interrogative and relative pronoun stem *k^wi-/k^wo- (e.g., Gonda 1954; Dunkel 1983; Szemerényi 1987; Dunkel 2000). This debate does not bear on any of the claims made here, so I will have nothing to say about this issue.

[37] For cases in which daughter languages of a sub-group share cognates conjunctions, only one language is listed here. So for instance, Vedic Sanskrit *utá* is identified as having an additive precursor, so the Avestan *utā* and Middle Persian *'wd* cognates are not also listed as originating in an additive.

(37) Latin *et*

qui	sceleratus	**et**	furiosus	erit.
WH.NOM.SG	criminal.NOM.SG	ADD	madman.NOM.SG	be.3SG.FUT.ACT

'He who is a criminal will **also** be a madman.'

Hor. *Serm.* 221–2

In Section 6.2 below, I provide a detailed analysis of the change from additive to conjunction that also motivates its apparent unidirectional behaviour (that is, changes from conjunction to additive are either unknown or rare).

The table in example (36) is restricted to the identification of the immediate diachronic precursor of the innovative conjunctions across Indo-European. These additives themselves of course have an antecedent history. This deeper ancestry is, however, far more uncertain, so there is very little that can be said with confidence. (The Appendix contains remarks on the deeper lineages of a few conjunction morphemes.) It is difficult to say, for instance, whether any particular lexical category preceded the additive stage. Many of the additives above appear to have developed either from adverbs or adpositions. Old Irish *ogus* stands out because it is the only example that I am aware of where the conjunction morpheme developed from a lexicalized collocation (as presented above in example 26). Perhaps the most secure aspect of the earlier history of the above additives is that they all went through a process of diachronic funnelling. That is, the ultimate sources of head-initial conjunction in archaic Indo-European were diverse, but the stage immediately conjunction was far less so.

6.1. Motivating conjunction renewal

We come now to the question of why so many archaic Indo-European languages recruited new conjunction exponents (on which, see generally Meillet 1958). The answer lies in the defective nature of enclitic postposed conjunction (cf. Cardinaletti & Starke 1999; Kaufman 2010: 22–38). The differences between enclitic and non-enclitic conjunctions are not restricted to mere prosodic deficiency (i.e., the need for a host). For instance, they cannot take another enclitic, such as a clitic pronoun (Goldstein 2016a: 86), as a complement. The following hypothetical example from ancient Greek illustrates this point:

(38) *...min≠te
3SG.ACC≠CONJ
'... and him'

There are no examples in the entire corpus of ancient Greek in which the postposed enclitic conjunction *te* conjoins the enclitic pronoun *min*.[38]

Furthermore, enclitic conjunctions cannot be focused. That is, there is no way to get an emphatic reading such as the following from the enclitic conjunctions of archaic Indo-European:

(39) I went out to dinner AND watched a movie.

The intuition here is that there is something surprising or unlikely in the speaker's view about the addition of the second conjunct. Since enclitic conjunctions in archaic Indo-European cannot be stressed, emphatic conjunction of the type in example (39) was presumably impossible.

[38] Sequences of multiple enclitics are well attested in ancient Greek, so there is no reason to think that the absence of cases such as example (38) is due to a prosodic constraint.

Indeed, reflexes of *$=k^we$ in Greek, Sanskrit, and Latin are standardly said to conjoin conceptually related elements (Gildersleeve & Lodge 1895: §476; Ruijgh 1971: 168–86, Klein 1992: 19–20; Viti 2008; Torrego 2009: 457; Probert 2015: 422–3): [39]

(40) i. *Sanskrit*
amṛ́tam márt$_i$yaṃ=**ca**
immortal.ACC.SG mortal.ACC.SG=CONJ
'immortal **and** mortal'
RV 1.35.2b

ii. *Greek*
autoús dé helória teũkhe kýnessin
3PL.ACC PTCL fodder.ACC.PL made.3SG.AOR.IND dog.DAT.PL
oionoĩsi=**te** pãsi
bird.of.prey.DAT.PL=CONJ all.DAT.PL
'(Achilles' wrath) made them fodder for dogs **and** all birds of prey.'
Hom. *Il.* 1.4–5

iii. *Latin*
senatus populus=**que** romanus
senate.NOM.SG people.NOM.SG=CONJ Roman.NOM.SG
'The Roman senate **and** people'
Cic. *Planc.* 37.90

Given the deficiencies of enclitic conjunction, there was a need for renewal.[40]

6.2. From additive to conjunction

In this section, I motivate the reanalysis of additive focus markers as conjunctions. The semantic and syntactic similarities between conjunctions and additives have long been known. Consider the following pair:

(41) i. I was given a suitcase with a million dollars. In addition, I was told that the mission was a secret.
ii. I was given a suitcase with a million dollars and I was told that the mission was a secret.

The meaning of these two examples is intuitively very similar. Despite this similarity, it is of course possible to distinguish additives from conjunctions. Syntactically, additives are one-place operators. Conjunctions, by contrast, are two place operators, but are more tightly integrated with their second coordinand (see Zhang 2010). Semantically, conjunctions are weaker than additives. Sentential conjunction in English, for instance, appears to allow any two propositions to be conjoined. Additives, however, impose stricter requirements on the coherence relation between the prejacent and preceding discourse, as illustrated by the following pair:

[39] This bias toward conceptually related coordinands I assume developed only after the rise of head-initial conjunction. Prior to that development, *$=k^we$ presumably exhibited no such bias. I am grateful to an anonymous reviewer for the impetus to clarify this point.

[40] A reviewer suggests that the motivation for the grammaticalization of new conjunctions across archaic Indo-European was the ability of enclitic conjunctions to occur inside syntactic constituents and thereby create surface discontinuities. I have not pursued this line of analysis for the following two reasons. First, syntactic discontinuity is a prominent feature of the syntax of Vedic, Greek, and Latin. The idea that speakers recruited non-enclitic conjunctions to avoid syntactic discontinuity is therefore at odds with the prominence of this feature in at least these three languages. Second, even after the archaic Indo-European languages acquired new conjunction exponents, it took a long time for the postposed conjunctions to die off. So it does not appear that head-initial conjunction was recruited as a replacement for postposed conjunction.

(42) i. I love turtles and fireflies lit up my night yesterday.
ii. I love turtles. In addition, fireflies lit up my night yesterday.

Both sentences are pragmatically unusual, but example (42ii) is odd because it is not easy to see how *I love turtles* and *fireflies lit up my night* form a coherent pair. There are then two aspects to the change from additive to conjunction. The first is an increase in the number of arguments of the operator, as conjunctions require two arguments. The second is a weakening of the coherence relations that characterize additive focus quantifiers.

To understand how the change from additive to conjunction works, we need to introduce a few concepts from focus semantics (Rooth 1985; 1992; 1996). Let us assume that discourse is organized around sets of questions that are under discussion (Roberts 2012). According to this view of discourse, focus is then the information that fills in a variable of a question:

(43) A: Who did Fatima invite to the party?
B: Fatima invited $[\text{Henry}]_{\text{F}}$.

The question *Who did Fatima invite to the party?* introduces a variable for which the answer will supply a value. The set of values that can fill in the variable is the set of focus alternatives.[41] The value that is selected as the answer is the focus of the utterance. In the example above, *Henry* is the focus of the utterance because it supplies a value for the variable introduced by the interrogative pronoun.

Two dimensions of meaning are typically recognized, the so-called ordinary meaning and the focus meaning (superscript *o* abbreviates 'ordinary meaning'; superscript *f* abbreviates 'focus meaning'):

(44) *Ordinary meaning*
$[[\text{Fatima invited Henry}]]^{o} = [[\text{Fatima invited Henry}]]$

(45) *Focus meaning (unordered)*
$[[\text{Fatima invited Henry}]]^{f} = \{[[\text{Fatima invited Henry}]], [[\text{Fatima invited Jack}]], [[\text{Fatima invited Noa}]], [[\text{Fatima invited Wilson}]], \ldots\}$

Recent work (e.g., Gast 2012; Kapitonov 2012; Ahn 2015) on the synchronic semantics of additive adverbials interprets them as focus quantifiers. Gast (2012: 106), for instance, breaks down the meaning of additive *too* as follows:

(46) i. John attended the meeting, too.
ii. *Presupposition*
$\{w|\exists\phi \in [[\text{John attended the meeting}]]^{f}: w \in \phi\}$
iii. *Assertion*
$[[\text{John attended the meeting}]]^{o}$

Additives require that the assertion contained in their prejacent be in the same set of focus alternatives as a preceding proposition in the discourse. In other words, the sentence in example (46i) presupposes that someone other than John from the discourse context attended the meeting.

With this background, we can now see how the change from additive to conjunction takes place. As with most if not all syntactic changes, this one too took place in a specific context (see further Garrett 2012), that of additives with null anaphor complements. I illustrate the reanalysis with Vedic Sanskrit *áti*, an adposition that means both 'beyond' and 'in addition to' (*WRV*: s.v. 3–9; Pinault 2008: 122–3). In the following example, it is possible to interpret *áti* as either an adposition or as a conjunction (*áti* continues **éti*, which is the source of the Latin

[41] I leave aside the issue of whether this set should be defined as the set of possible answers or the set of true answers.

conjunction *et*).[42] To be sure, the former interpretation is standard. Nevertheless, the ability to extract two readings from this example illustrates the proximity of additivity and conjunction. The following passage comes from a *dānastuti* hymn, in which the generosity of a patron is praised. The opening of the hymn answers a question such as *What did the patron give to me?*:

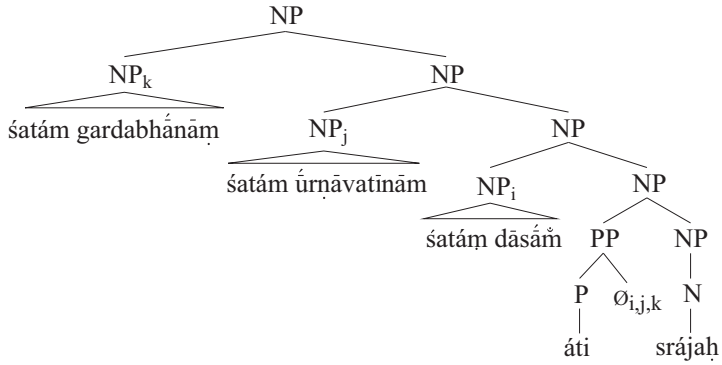
(47) *Adposition with null complement*

dáśa	máhyam	pautakratáḥ	
ten.ACC.SG	1SG.DAT	son.of.Pūtakratu.NOM.SG	
sahásrā	dásyave	vṛ́kaḥ	
thousand.ACC.PL	Dasyave.NOM.SG	Vṛ́ka.NOM.SG	
nítyād	rāyó	amaṃhata	
own.ABL.SG	wealth.ABL.SG	grant.3SG.IMPF.MID	
śatám≠me	gardabhā́nāṃ		
hundred≠1SG.OBL	donkey.GEN.PL		
śatám	ū́rṇrāvatīnām		
hundred	wooly.GEN.PL		
śatáṃ	dāśā́ṁ	**áti**	srájaḥ
hundred	slave.GEN.PL	beyond	garland.ACC.PL

'To me Dasyave Vṛ́ka, son of Pūtakratu, granted ten thousands from his own wealth.
A hundred donkeys for me
A hundred wooly (ewes),
A hundred slaves, **in addition to** (that) garlands'
RV 8.56.2–3 (tr. adapted from Jamison and Brereton 2014: 1139)

The complement of the adposition *áti* is a null anaphor bound by the preceding NPs, *śatám gardabhā́nāṃ*, *śatám ū́rṇrāvatīnām*, and *śatáṃ dāśā́ṁ*.[43] These NPs satisfy the presupposition of *áti* presented in example (46). The prepositional phrase is adjoined to the final noun *srájaḥ* 'garlands':

(48) *Adjoined adposition with a null anaphor complement*



[42] It is not entirely clear how far back **éti* should be reconstructed. No reflex of the adverbial or adposition **éti* is attested in Anatolian, but the ablative-instrumental case marker *-ti* may continue **éti* (see Oettinger & Melchert 2009: 57–9 for a discussion). The Tocharian A ablative ending *-äṣ* is thought by many to continue **-eti* (Jasanoff 1987: 109). I am grateful to Craig Melchert for bringing these references to my attention.

[43] One might wonder whether it is possible to parse *áti* in example (47) as a head-final adposition, with the preceding noun phrases as its complements. This analysis seems to me unlikely given the caesura between *dāśā́ṁ* and *áti*.

In this context, *áti* has a semantic relationship with both the preceding NPs and the NP *srájaḥ*. Although the null complement of *áti* is bound by the preceding NPs, its function is to add *srájaḥ* to the set of those NPs, which are all members of the same set of focus alternatives (i.e., contribute to the same question).

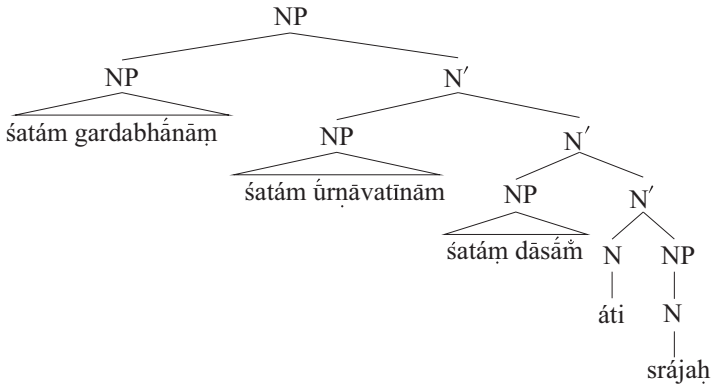
Semantically, there is thus an impetus to interpret *áti* as pairing *srájaḥ* and the previous NPs. It is this semantic impetus that encourages the reanalysis of *áti* as a two-place operator (for expository convenience, the following example only contains the last two conjuncts):

(49) $[_{NP}\ [_{NP}$ śatáṃ dāśā́ṁ$_i$ $]\ [_{NP}\ [_{PP}$ áti ø$_i$ $]\ [_{NP}$ srájaḥ$]\ ]\ ] > [_{NP}$ śatáṃ dāśā́ṁ áti srájaḥ$]$

In the context of a null anaphor, *srájaḥ* appears to be the complement of *áti*. The semantics of the adposition in fact encourage this perception, since the function of *áti* is essentially to add *srájaḥ* to the set of NPs that have already been advanced as answers to the question under discussion. In essence what has happened is that the requirement on the discourse context (i.e. the presupposition) has turned into a requirement on the local syntactic context, namely the requirement that *áti* have two arguments.[44]

Under the analysis of *áti* as a conjunction, we end up with the following structure:[45]

(50) *Adposition reanalyzed as conjunction*



áti no longer heads a prepositional phrase adjoined to *srájaḥ*, but rather takes *srájaḥ* as its complement. I suggest that the change from additive **éti* to conjunction in Italic took place originally in a context such as that sketched above.[46]

If the development from additive to conjunction followed a similar pattern in other languages, then this analysis would motivate the bias in directionality that we find in this change. Cross-linguistic research has revealed that the change from additive to conjunction is far more robustly represented than the change from conjunction to additive (Mithun 1988; Stassen 2000; Stassen 2001; Heine & Kuteva 2002: 43; Orlandini & Poccetti 2007: 191, 193;

[44] One could argue that *áti* in example (48) should be analysed as a postposition with a null complement and not a preposition. Under such an analysis the conjunction reading would entail a change in head directionality, namely from a head-final adposition to a head-initial conjunction. In cases such as this, I would argue that the head directionality of the conjunction is still a diachronic epiphenomenon, in as much as it results from the reanalysis. That is, in an example such as (48), *áti* added the constituent to its right to the set of answers to the question under discussion. It is this contextual property that led to its development as a head-initial conjunction, as elaborated above. So even in cases where there is a change in head directionality, such a shift can still be an epiphenomenon of diachrony. The issue of head directionality is taken up in greater detail in Section 7.1 below.

[45] For the assumption that conjunctions lack categorial content, see Section 4.1 above. Without this assumption, the change from additive to conjunction would look much the same. The only difference would be a change in the categorial content from P to, say, &.

[46] This change in all likelihood took place first among NPs, which led to the Umbrian NP-conjunction *et*. Cross-categorial *et* in Latin would then have resulted from loss of this selectional restriction. This issue is discussed in more detail in Section 7.2 below.

Eberhardt 2017). According to the analysis above, the motivation for the reanalysis exists only for the change from conjunction to additive. The opposite direction of the change (assuming that it does in fact exist) would be motivated by a different set of factors.

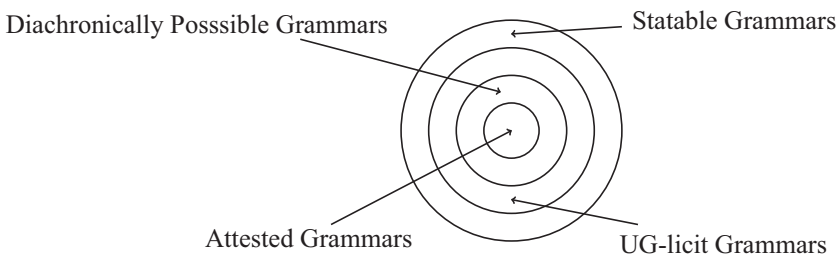
7. The symbiosis of linguistic theory and language change

Having now presented my own account of the history of conjunction in archaic Indo-European, I address a larger question raised by the analysis of Mitrović (2014) and Mitrović & Sauerland (2016), namely: What should the relationship between linguistic theory and language change be? In this section, I argue, building on the insights of Hale (2007) and Kiparsky (2008), that the relationship should be one of mutual symbiosis.

There are at least two reasons why historical linguists need a formal, synchronic theory of language. The first is that, as Kiparsky (2008: 23) remarks, 'synchronic assumptions have diachronic consequences'. If a theory of syntax contains a transparency principle (Lightfoot 1979) that constrains the synchronic complexity of syntactic derivations, that principle will have diachronic consequences. In a similar vein, if we think that certain cells in a paradigm have a privileged status (e.g., Albright 2002), then those forms are likely to play a role in morphological change. The second reason why historical linguistics, and the study of syntactic and semantic change in particular, needs a formal theory is simply precision (cf. Hale 2007: 47). The syntactic and semantic changes (such as category change, structural reduction, and semantic bleaching; see, e.g. Condoravdi & Deo 2014; Goldstein 2016b) involved in grammaticalization are difficult to characterize adequately without a formal apparatus.

Language change, in turn, has critical contributions to make to linguistic theory. In particular, it enables linguists to determine what properties of natural language are properties of Universal Grammar and which are not (cf. Culicover and Jackendoff 2005: 41; Deo 2015: 181). Hale (2003) makes this point with the following diagram:

(51) *Typology of grammars (adapted from Hale 2003: 363)*



The crucial point is that set of diachronically possible grammars is a proper subset of the UG-licit grammars. So in principle the typological distribution of linguistic properties can reflect properties of Universal Grammar or it can reflect processes of linguistic change. Anderson (2001: 14) elaborates on this point (cf. Baudouin de Courtenay 1972: 63):

> Linguistic theory *per se* is not the only factor that determines the range of linguistic systems found in nature. The theory of possible linguistic systems interacts with other effects, and in particular with the range of possible diachronic developments and their sources, to yield the range of attested linguistic systems. That is, the set of actual languages lies in the intersection of those permitted by linguistic theory with the set of those for which a possible developmental scenario can be constructed.
>
> Anderson (2001: 14)

In the following subsections, I present two cases of grammatical properties that Mitrović (2014) and Mitrović & Sauerland (2016) attribute to Universal Grammar which are better analysed as diachronic epiphenomena. These are the head directionality and selectional constraints of conjunctions.

7.1. Head directionality

According to Mitrović (2014) and Mitrović & Sauerland (2016), the head-initial behavior of conjunctions such as Sanskrit *utá* results from a universal head-initial configuration (cf. Kayne 1994). Given that cross-linguistically conjunctions are predominantly head-initial, it is prima facie attractive to attribute this property to Universal Grammar. From a diachronic perspective, the head-initial configuration of Universal Grammar could then motivate the repeated grammaticalization of head-initial conjunctions across archaic Indo-European.

Despite these apparent advantages, the assumption that conjunction morphemes are universally head-initial is problematic. For one, typological predominance is not tantamount to a linguistic universal (Kiparsky 2008). When it comes to Indo-European conjunction specifically, we do not need Universal Grammar to account for the head directionality of innovative conjunctions. The head directionality of conjunction is an epiphenomenon of its source construction. The conjunctions in example (36) that arose from additive focus operators are head-initial because their precursors were themselves head-initial and this property was maintained after the reanalysis. Likewise, when the diachronic precursor of conjunction is head-final, then the conjunction too is head-final.[47] Sanskrit *utá* illustrates both of these changes. It was used as both a head-final and a head-initial additive:

(52) *Head-initial and head-final additives*

i. yūpavraskā́ utá yé
hew.sacrificial.post.NOM.PL CONJ REL.NOM.PL
yūpavāhā́ś caṣā́laṃ yé
convey.sacrificial.post.NOM.PL knob.ACC.SG REL.NOM.PL
aśvayūpā́ya tákṣati
horse.post.DAT.SG fashion.3PL.PRES.ACT

yé cā́rvate pácanaṃ sambhárant
REL.NOM.PL steed.DAT.SG cooking.vessel.ACC.SG gather.3PL.PRES.ACT
utó téṣām abhígūrtir na invatu
ADD 3PL.GEN hymn.of.praise.NOM.SG 1PL.OBL impel.3SG.PRES.ACT.IMPV
'The hewers of the sacrificial post and its conveyors, those who fashion the knob for the post for the horse, and those who assemble the equipment for cooking the steed–let the applause **also** of those urge us on.'
RV 1.162.6 (tr. Jamison & Brereton 2014: 345; cf. Klein 1985: 448)

ii. Sanskrit *utá* (*WRV*: 247, 249; Klein 1985: 440–60; Dunkel 2014: 337)
evá-id índraḥ suté
thus.ADV-FOC Indra.NOM.SG press.PAST.PART.LOC.SG
astāvi sóme bháradvājeṣu kṣáyad
praise.3SG.AOR.PASS soma.LOC.SG Bharadvāja.LOC.PL rule.3SG.INJ.ACT

[47] In Anatolian, PIE *≠h_2o (> Luvian ≠ḫa, Hittite ≠(y)a) developed into a postposed conjunction from a postposed additive.

in maghónaḥ
FOC liberal.GEN.SG
ásad yáthā jaritrá **utá** sūriíḥ
be.3SG.PRES.SUBJ.ACT COMP singer.DAT.SG ADD lord.NOM.SG
'Thus was Indra praised when the soma was pressed in the presence of the Bharadvājas. He shall rule the liberal ones, so that a lord (i.e., a benefactor) will appear for the singer **as well**.'

RV 6.23.10 (tr. Klein 1985: 442–3)

As a conjunction, *utá* again exhibits both head-initial and head-final behavior:

(53) *Head-initial and head-final conjunction*

i. ávantu naḥ pitáraḥ supravācanā́ **utá**
help.3PL.PRES.ACT.IMPV 1PL.OBL father.NOM.PL worthy.of.good.praise.NOM.PL CONJ
devī́ deváputre
goddess.NOM.DU sons.are.heavenly.NOM.DU
'Let the Fathers help us, those good to proclaim, **and** the two goddesses [=Heaven and Earth], whose sons are the gods'

RV 1.106.3ab (tr. Jamison & Brereton 2014: 253; cf. Klein 1985: 300)

ii. *Head-final conjunction* (Klein 1985: 344–53)
agníḥ pū́rvebhir ṛ́ṣibhir ī́dyo
Agni.NOM.SG previous.INSTR.PL Rishi.INSTR.PL to.be.praised.NOM.SG
nū́tanair **utá**
current.INSTR.PL CONJ
'Agni, to be invoked by ancient sages **and** by the present ones– he will carry the gods here to this place.'

RV 1.1.2ab (tr. Jamison & Brereton 2014: 89; cf. Klein 1985: 344)

The head directionality of the conjunction is thus conditioned by the head directionality of its diachronic source.[48]

This claim raises the possibility that the cross-linguistic distribution of conjunction is not a reflection of Universal Grammar but rather a reflection of the diachronic sources from which conjunctions develop. If head-initial additive focus operators provided the source for conjunctions in other languages families as often as they did in Indo-European, then the typological distribution of conjunction could not be interpreted as evidence in support of head-initial conjunction in Universal Grammar. This broader typological claim lies beyond the scope of this paper, however.

7.2 Selectional constraints

Mitrović (2014) and Mitrović & Sauerland (2016) also rely on universal lexical categories to account for the selectional restrictions of conjunctions. Only a few conjunctions in archaic Indo-European exhibit selectional constraints on the category of their complement:

[48] One might wonder whether cross-category harmonizing plays any role in the development of head-initial conjunction across archaic Indo-European. The basic idea of such an analysis would be that the head-initial setting of head-directionality parameter in other categories (such as the verb phrase or adpositions) is responsible for the development of head-initial conjunction. Vedic Sanskrit and the Tocharian languages present challenges to this approach that in my view are insurmountable. Such an account would not be able to account for the data in example (53). In a similar vein, the Tocharian data would also be hard to account for, since Tocharian recruited new head-final and new head-initial conjunction morphemes. More generally, it would be difficult to identify a head-initial phrasal category in for example, Vedic Sanskrit that would have served as the model for conjunction. Biberauer & Sheehan (2013: 4–15) describe further shortcomings of cross-category harmonizing.

(54) N-AND
i. Umbrian *et*
ii. Tocharian A *yo*
iii. Tocharian B *wai*

(55) S-AND
i. Umbrian **ene**
ii. Old Irish *=ch*
iii. Gothic *=(u)h*

The histories of these conjunctions are somewhat muddled, but what clues there are suggest that these synchronic selectional restraints reflect the context from which they developed into conjunctions.

The clearest cases are Tocharian B *wai* and Umbrian **ene**. Van Windekens (1976: 30) made the comparison between Tocharian B *wai* and Tocharian *we*, the feminine form of 'two', both of which would straightforwardly continue PIE **dwai* (cf. Blažek 1998: 14).[49] Grammaticalization of an NP-conjunction from 'two' is, while apparently not common, certainly known from elsewhere. Haspelmath (2007: 36–7) refers to this phenomenon as SUMMARY CONJUNCTION (see also Devine & Stephens 1999: 147, 159; Heine & Kuteva 2002: 303–4):

(56) *Mongolian*
bagš, Gombo xojor
teacher Gombo two
'teacher and Gombo'

Conjunction is signalled not by an operator that pairs elements together but rather by a numeral that that sums up the coordinands.[50] Since this conjunction strategy is restricted to NPs, the category restriction on Tocharian B *wai* would be a remnant of its earlier status as a numeral.[51]

If we can locate the origin of the Umbrian NP-conjunction *et* in an adposition that took NPs as complements (as illustrated with its Sanskrit cognate *áti* in example 50), then this diachronic source would also motivate its synchronic selectional restrictions.[52] The Tocharian A NP-conjunction *yo* also appears to have developed from an adverbial that originally took noun phrases as complements, but there is less agreement on the history of this word (see, e.g., Pinault 2008: 472–4; 2011: 394–6; Kim 2012: 131; 2014: 129 n. 5).

The Umbrian sentential conjunction **ene** is cognate with Latin *enim*, which also takes clauses as arguments:

(57) solet **enim** aliud sentire et loqui
do.usually.3SG.PRES.ACT PTCL other.ACC.SG think.PRES.INF CONJ say.PRES.INF
'**For** he usually thinks one thing and says another.'

Cic. *Fam*. 8.1.3

[49] To my knowledge, it has not been observed that the analysis of Van Windekens accounts for why the Tocharian B lexeme for 'two' does not morphologically encode grammatical gender, while Tocharian A has masculine *wu* and feminine *we*. The recruitment of Tocharian B *wai* as a conjunction would be responsible for this difference.

[50] Weber (1989: 351) notes that summary conjunction is found not only with numerals, but also quantifiers such as 'all' and 'whatever'.

[51] It is far from clear how the head-initial behavior of *wai* developed. One possibility would be a reduction from X *wai* Y *wai* > X *wai* Y. The doubling of a conjunction that originates in 'two' is also found in Mparntwe Arrernte (Australia; Haspelmath 2007: 37).

[52] The absence of categorial restrictions in Latin *et* would then have resulted from a later generalization. In fact, the freedom from selectional restrictions on the phrasal category of their complements that is so typical of the archaic Indo-European conjunctions would be the result of generalizing the conjunction beyond its context of origin.

Enim is a second-position enclitic that introduces reason clauses. In this example, its argument is the entire sentence. It is reasonably clear that Latin *enim* and Umbrian **ene** originate in an adverbial pronominal form (Orlandini & Poccetti 2007: 196), which perhaps meant 'in this respect' (*WOU*: 344). Whatever the exact precursor was, it had propositional scope, which is maintained in both Latin and Umbrian.[53] Further evidence for selectional restrictions as diachronic by-products also comes from clausal operators such as Hittite *nu* (see example 33 above), which originates in a temporal adverb 'now' that scoped over propositions.

In sum, if the goal of linguistic science is to adequately characterize the nature of the linguistic faculty, it is essential that we be able to distinguish properties of language that are synchronically motivated from those that are epiphenomena of change (see further Givón 2015; Madariaga 2017). Linguistic theory therefore needs language change to know what the scope of its theory should be. As Hale observes above, we study language change so that we know which properties of language belong to Universal Grammar and which do not. Evolutionary Phonology (Blevins 2004; Blevins & Garrett 2004), for instance, relieves a synchronic theory of phonology of a range of constraints by attributing the cross-linguistic distribution of phonological properties to historical change. In a similar vein, my analysis of archaic Indo-European conjunction demonstrates that we do not necessarily need to enrich the ontology of linguistic theory to account for prominent cross-linguistic morphosyntactic patterns. Synchronic properties that Mitrović (2014) and Mitrović & Sauerland (2016) encode directly in Universal Grammar are on my analysis epiphenomena of linguistic change.

8. Conclusion

I have advanced a new history of conjunction in archaic Indo-European according to which the earliest attested daughter languages and reconstructed Proto-Indo-European have only postposed conjunction. Every branch of Indo-European then grammaticalizes a new conjunction morpheme, which results in languages with both head-initial and postposed conjunction. Contra the analysis of Mitrović (2014) and Mitrović & Sauerland (2016), the syntactic and semantic differences of the two types of conjunction do not result from a difference in categorial content. Their attempt to account for the archaic Indo-European data by means of Universal Grammar raises the question of the relationship between linguistic theory and language change. Building on work by Mark Hale and Paul Kiparsky, I have argued that this relationship should be one of mutual symbiosis. Synchronic theories of language need to take diachronic patterns into account in order to distinguish contingent properties of language from true universals (Kiparsky 2008). The prevalence of head-initial conjunction in archaic Indo-European is best accounted for as a by-product of its diachronic precursors. In a similar vein, the selectional constraints of conjunctions reflect the context from which they originally develop and are not determined by a universal lexical category. I suspect that the evidence from archaic Indo-European conjunction is not unique in what it offers to linguistic theory, and that further investigation of diachronic morphosyntax will reveal more such cases.

Abbreviations

AED: Vladimir E. Orel (1998). *Albanian etymological dictionary*. Leiden: Brill.
ALEW: Wolfgang Hock (2015). *Altlitauisches etymologisches Wörterbuch*. 3 vols. Hamburg: Baar.

[53] If we assume that *et* was originally a NP-conjunction and **ene** a sentential conjunction, then the loss of the former could have lead to the generalization of the latter in Oscan, with the result **ínim** was left as the only conjunction. This is only one possible scenario, however.

Charpin: François Charpin (1978–1991). *Lucilius: Satires*. 3 vols. Paris: Les Belles Lettres.
CIL: *CIL* (1853–). *Corpus inscriptionum Latinarum*. Berlin: Berlin-Brandenburgische Akademie der Wissenschaften.
Crawford: Michael Hewson Crawford, Will Broadhead, James Clackson, Federico Santangelo, Errietta M. A. Bissa & Gabriel Bodard (eds.) (2011). *Imagines italicae: A corpus of Italic inscriptions*. 3 vols. London: Institute of Classical Studies University of London.
EDG: Robert S. P. Beekes (2010). *Etymological dictionary of Greek*. Leiden: Brill.
EDHIL: Alwin Kloekhorst (2008). *Etymological dictionary of the Hittite inherited lexicon*. Leiden: Brill.
EWDS: Friedrich Kluge (2011). *Kluge: Etymologisches Wörterbuch der deutschen Sprache*. Ed. by Elmar Seebold. 25th ed. Berlin: de Gruyter.
GP: John D. Denniston (1954). *The Greek particles*. 2nd ed. Oxford: Oxford University Press.
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APPENDIX

The following examples illustrate additive readings for head-initial conjunctions:[54]

(58) *Head-initial conjunctions that also have an additive meaning*

i. Sanskrit *utá* (= 58i above; Klein 1985: 298-344)
yūpavraskā́ utá yé yūpavāhā́ś
hew.sacrificial.post.NOM.PL CONJ REL.NOM.PL convey.sacrificial.post.NOM.PL
caṣā́laṃ yé aśvayūpā́ya tákṣati
knob.ACC.SG REL.NOM.PL horse.post.DAT.SG fashion.3PL.PRES.ACT
yé cā́rvate pácanaṃ sambháranty
REL.NOM.PL steed.DAT.SG cooking.vessel.ACC.SG gather.3PL.PRES.ACT
utó téṣām abhígūrtir na invatu
ADD 3PL.GEN hymn.of.praise.NOM.SG 1PL.OBL impel.3SG.PRES.ACT.IMPV
'The hewers of the sacrificial post and its conveyors, those who fashion the knob for the post for the horse, and those who assemble the equipment for cooking the steed–let the applause **also** of those urge us on.'
RV 1.162.6 (tr. Jamison & Brereton 2014: 345; cf. Klein 1985: 448)

ii. Greek *kaí* (*GP*: 293–308; Lüttel 1981; Crespo 2014: 135; Dunkel 2014: 391)
p^{h}aínetai dé **kaì** taũta … trie:éresi mén olígais
seem.3SG.PRES.MID PTCL ADD DEM.NOMP.PL … trireme.DAT.PL PTCL few.DAT.PL
k^{h}ró:mena.
have.PERF.PART.MID.NOM.PL
'These (navies) **too** seem to have … few triremes.'
Thuc. 1.14.1

iii. Latin *et* (= example 37 above; *OLD*: s.v. 4–6; Buck 1928: 20; Dunkel 2014: 261)
qui sceleratus **et** furiosus erit.
WH.NOM.SG criminal.NOM.SG ADD madman.NOM.SG be.3SG.FUT.ACT
'He who is a criminal will **also** be a madman.'
Hor. *Serm.* 221–2

iv. Gothic *jah* (Lehmann 1986: s.v.; Streitberg 2000: s.v.; Dunkel 2014: 385)
in≈uh þis nu **jah** leik mans andnam
in≈CONJ this.GEN.SG now ADD body.ACC.SG man.GEN.SG assume.3SG.PRET.ACT
'On account of this (God) then **also** assumed the body of man.'
Skeireins 1d:9

v. Armenian *ew* (Schmitt 2007: 216; Dunkel 2014: 245)
erknêr erkin erknêr erkir
be.in.labour.3SG.IMPF.ACT heaven.NOM.SG be.in.labour.3SG.IMPF.ACT earth.NOM.SG
erknêr **ew** cov-n cirani
be.in.labour.3SG.IMPF.ACT ADD sea.NOM.SG-DEF purple.NOM.SG
'Heaven was in labour, earth was in labour, the purple sea was **also** in labour.'
Hist. Arm. 1.31

[54] A reviewer wonders about the validity of the Old Church Slavic data presented below. Since the example is drawn from a translation of the New Testament, the question arises as to whether the additive behaviour of Old Church Slavic *i* is due to Greek *kaí*. We can rule out this possibility, since *i* functions as an additive in East and West Slavic, which means that this property is inherited.

vi. Old Church Slavic *i* (Vaillant 1964: 369; Sadnik and Aitzetmüller 1989: 34; Dunkel 2014: 339)
posъla **i** togo...
send.3SG.PRET.ACT ADD 3SG.ACC
'He sent him **too** ...'

Mark 12:6

vii. Old Norse *ok* (Cleasby and Vigfússon 1957: s.v. B)
hann heyrir **ok** þat er gras vex
3SG.NOM hear.3SG.PRES.ACT ADD 3SG.ACC COMP grass.NOM.SG grow.3SG.PRES.ACT
á jörðu
on earth.DAT.SG
'He **also** hears this, how grass grows on the earth.'

Gylfaginning 27

viii. Lithuanian *ĩr* (Fraenkel 1962-5: 15; Endzelīns 1971: §453; Dunkel 2014: 337, 661; *ALEW*: s.v.)
alkanám **ir** juodà dúona skaní.
hungry.DAT.PL ADD dirty.NOM.SG bread.NOM.SG tasty.NOM.SG
'**Even** dirty bread tastes good to the hungry.'

(Senn 1957: 15)

ix. Albanian *dhe*
Jap gjithçka për të, **dhe** jetën
give.1SG.PRES.ACT everything for 3SG.ACC ADD life
'I give everything for him, even (my) life.'

(Buchholz & Fiedler 1987: 387)

In some cases, an additive meaning for a conjunction is not attested, but is nevertheless thought to have existed at some point. Untermann (*WOU*: 344), for instance, suggests that an additive meaning preceded the development of conjunction in Oscan **ním** and Umbrian **ene**. Although Old High German *inti* is not attested as an additive (Axel 2007: 159), there is good reason to believe that its precursor meant 'demgegenüber' (Behagel 1932: §1448; *EWDS*: s.v. *und*) and from there developed into an additive and then a conjunction. Likewise, Old Prussian *bhe* appears to be used exclusively as a conjunction, but Lithuanian *be* preserves an older meaning of 'still, yet' (Endzelīns 1971: §454). Old Irish *ocus* is not used synchronically as an additive (*eDIL*: s.v.), but appears to have developed from one. Albanian *e* is evidently not used in an additive sense (p.c., Dalina Kallulli). Given its uncertain history (see note 34 above), it is not possible to assume an additive stage for this conjunction as we did for Germanic. Finally, in Venetic, Celtiberian, Gaulish, and Lycian, the paltry remains of the languages do not enable us to know whether their conjunction morphemes could also be used as additives.

In a few cases, we have traces of the deeper lineage of conjunction morphemes. For instance, Greek *kaí* was in all likelihood once a comitative adposition meaning 'with'. The evidence for this view comes from the compound *kasí-gne:tos* 'brother' (lit., 'with-born'; *EDG*: 653-4) and the Hittite adposition *katta*/*kattan*/*katti* 'beside, next to, with' (Legerlotz 1858; Lejeune 1960; Lüttel 1981; Hackstein 2010: 403; Hackstein 2011: 196). So this would be an example of the well-attested change from comitative to conjunction (Haspelmath 2007: 10). In most cases of conjunction, however, we are unable to say much with certainty about their prehistory. For my purposes, however, it is shallow diachrony that is crucial.