The Split T Analysis

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Abstract

This essay pursues *The Split T Analysis*, claiming that finite clauses have three syntactically active T heads, roughly corresponding to the Reichenbachian S, R, E: Speech Tense, $\mathbf{T_S}$, in the C-domain, Referential Tense, $\mathbf{T_R}$ (or simply T) in the T-domain, and Event Tense, $\mathbf{T_E}$, in the v-domain. This analysis, it is argued, enables a coherent account of the relationship between tense morphology (including Tense Agreement) and Tense syntax (including Sequence of Tenses phenomena and Double Access Readings).

Keywords: Double Access Readings, Sequence of Tenses, Tense, Tense Agreement, Tense computation, the syntax-PF correlation

1. **Introduction**[*]

Tense more than most other categories illustrates that grammar is a computational system. This was shown to be the case already in *Elements of Symbolic Logic* by Hans Reichenbach (1947) and has since been further corroborated in the work of Chomsky (1957 onward) and in numerous individual studies (including Dahl 1985, Hornstein 1990, Giorgi and Pianesi 1997, Cinque 1999, Julien 2001, Guéron and Lecarme 2004, Sigurðsson and Maling 2012). The fundamental problem raised by Tense and the various Tense systems found in languages of the world can be stated as the simple but big question in (1).

(1) How do humans compute and express Tense?

The classical Reichenbachian approach to Tense is a three part model, based on the notions Speech Time, Event Time, and, crucially, Reference Time, abbreviated as **S**, **E**, **R**, respectively. Tense systems typically involve a non-finite and a finite part. The non-finite part expresses a computational relation between E and R (E "sooner than" R, etc.). Designate this

[*] Many thanks to … for valuable remarks and discussions.

relation as **E↔R**, where the double edged arrow simply denotes "a computational relation." The finite part, in turn, expresses a computational relation between S and E↔R (and not only R itself, as in Reichenbach 1947): **S↔(E↔R)**. To illustrate this I will be using the following connectives (following Sigurðsson and Maling 2012):

(2)	a.	=	unshifted	'simultaneously as'
	b.	≥	–FUTURE (present/past)	'no later than'
	c.	>	+PAST	'sooner than' ('before')
	d.	≤	–PAST (present/future)	'no sooner than'
	e.	<	+FUTURE	'later than' ('after')

In the simple tenses this double computational relation, S↔(E↔R), is not discernible, as R and E are simultaneous. This is illustrated in (3).

(3) *The simple tenses:*

	Non-finite	**Finite**	Reading	Example
a.	(E = R)	> S	**past**	Hans left
b.	(E = R)	≤ S	**present/future**	Hans leaves
c.	(E = R)	< S	**future**	Hans will leave

In addition to the unshifted E = R, the non-finite part of tense systems like the English one has two potentially shifted relations–towards past (≥) and towards future (≤), as illustrated in (4).

		Non-finite	Reading		Example
(4)	a.	E = R	unshifted	as in (most) gerunds[1]	working
	b.	E ≥ R	present/past	as in past participles	(has/had) worked
	c.	E ≤ R	present/future	as in infinitives	(to) work

[1] I agree with Stowell (1982:563) that "the understood tense of the gerund is completely malleable to the semantics of the governing verb," at least in unmarked cases (in contrast, Hornstein (1990:115ff), argues that gerunds have their own temporal structure). That is, the internal Event Time of gerunds (and of nominalizations, as in "They witnessed the destruction of their town") is dependent or parasitic on the Tense computation of the governing predicate.

The clear-cut past (>) and future (<) relations between E and R are not disambiguated by grammatical or systematic means in languages of this type, instead being subsumed under the more general, ambiguous relations present/past (≥) and present/future (≤). This ambiguity of the non-finite tenses is widespread across languages, perhaps universal.

The PAST-IN-THE-PAST reading of the regular past perfect renders the cooperation of the non-finite and the finite parts of the tense system more easily detectable. It is exemplified in (5).

(5) [Einstein:] Hans had read the book (at 9 o'clock)

In (5) the time of the reading event, E, was prior to R, the reference time expressed by *had* [at 9 o'clock], E↔R in turn being prior to the speaker's (here Einstein's) saying so, S. The perfect tense system in English type languages involves the nonfinite –FUTURE (present/past) relation, E ≥ R, as sketched in (6).

(6) *The English perfect tense system:*

	Non–finite	**Finite**	Construction	Example
a.	(E ≥ R)	> S	perfect **past**	Hans **had** read the book
b.	(E ≥ R)	= S	perfect **present**	Hans **has** read the book
c.	(E ≥ R)	< S	perfect **future**	Hans **will** have read the book

Conversely, a truly progressive tense system, such as the Icelandic one,[2] involves the main verb –PAST (present/future) relation, E ≤ R, plus past (>S), present (=S), or future (<S) of the finite auxiliary *vera* 'be'. This is illustrated in (7)–(8) (modeled on (13)–(14) in Sigurðsson and Maling 2012).

(7) a. Hans var að lesa.
Hans was to read ≈ 'Hans was reading.'
b. Hans er að lesa.
Hans is to read ≈ 'Hans is reading.'

[2] "[T]here is no real *temporal* distinction between the progressive tenses and the simple tenses in English, English using the progressive to express the simple tense relations even more commonly than Icelandic does (where this is also possible, and is currently spreading, due to the ambiguity of (E ≤ R), which means both 'future' (E < R) and 'present' (E = R))" (Sigurðsson and Maling 2012:375).

c. Hans verður að lesa.
she will-be to read ≈ 'Hans will be reading.'[3]

(8)	Non-finite	**Finite**	Construction	English glosses
a.	(E ≤ R)	> S	progressive, **past**	Hans **was** to read
b.	(E ≤ R)	= S	progressive, **present**	Hans **is** to read
c.	(E ≤ R)	< S	progressive, **future**	Hans **will be** to read

A central question linguistics needs to address and try to answer is where in grammar or language this tense computation takes place–is it morphological, semantic/pragmatic (as commonly assumed), or is it syntactic? In the following I will sketch a syntactic analysis.[4]

2. Basic analysis

The most basic hypothesis pursued here (see also Sigurðsson and Maling 2012) is that finite clauses have three syntactically active (but often silent) T heads, roughly corresponding to Reichenbachian S, R, E, as stated in (9).

(9) a. Speech T, $\mathbf{T_S}$, in the C-domain
b. Referential T, $\mathbf{T_R}$ (or simply T) in the T-domain
c. Event T, $\mathbf{T_E}$, in the v-domain

The "T-spine" of the clause is as sketched in (10).

(10) $[_{CP} \ldots T_S \ldots [_{TP} \ldots T_R \ldots [_{vP} \ldots T_E \ldots]]]$

[3] The sentence in (7c) may also have the modal reading 'Hans must read', but that reading is irrelevant here.

[4] For my present purposes the term "computation" is confined to the narrowly syntactic computation. Much like other grammatical categories Tense has both semantic and morphological correlates (in languages with Tense morphology)–thus having "many faces." The semantic interpretation of Tense takes the syntactically computed tense values as input into semantic/pragmatic processes, and the externalization component also takes the syntactically computed values as input into interface-specific processes (such as the morphological decision of past tense forms like *sang* and *shouted*). I will only be concerned with the syntactic computational system here, setting interface-specific processes aside. As we will see, Tense syntax is quite distinct from Tense morphology, the former building relations, the letter interpreting these relations in terms of discrete units (morphemes, etc.). The distinction between Tense syntax and interface-specific Tense semantics/pragmatics is less clear.

The PAST-IN-THE-PAST reading of the past perfect in (5) can thus be analyzed as in (11).

(11) NOW [$_{CP}$ … T_S ... [$_{TP}$ ... T_R ... [$_{vP}$ ... T_E ...]]]

had *read*

↑_ _ _ _ _ _ _ ↑↑_____↑↑_____↑

Contextual control *Agree* *Agree*

simultaneous *past* *past*

On this approach, Agree is a *valuing relation* (pace Chomsky 2001:5). Thus, in (5)/(11) T_E (the time of the reading event) is valued under Agree as "past" in relation T_R, which in turn is valued as "past" in relation to T_S (the speech time).[5] In contrast, control, whether full or partial, syntactic or contextual, is an *identity relation* (regardless of whether it is derived by movement).[6] Thus, in (5)/(11), T_S is set under contextual control as identical or simultaneous with speaker NOW.

The interpretation of any clause is subject to matching relations between the v-domain (containing the propositional content), the T-domain, and the C-domain. Thus, an event participant (a vP-internal NP) is valued in relation to a Person head in the T-domain, as being either +Pn or –Pn, NP_{+Pn} in turn being positively or negatively valued in relation to abstract "speaker" and "hearer" categories in the C-domain, thereby getting their 1st, 2nd or 3rd person values.[7] The general, universal computational scheme of full clauses is sketched in (12).

(12) CONTEXT [$_{CP}$ …… [$_{TP}$ ..... [$_{vP}$ ……]]]

↑_ _ _ _ _ _ _ _ _ _ _ _ _ ↑ ↑_____↑↑_____↑

Contextual control *Agree* *Agree*

(identity/reference) (valuing) (valuing)

[5] This is a slight simplification–it is actually the relation $T_E \leftrightarrow T_R$ that is valued as "past" in relation to T_S.

[6] Syntactic control is more heavily constrained than contextual control, but both are referential identity relations.

[7] This is a big issue and a detailed discussion of it would take us much too far afield. I refer the reader to Sigurðsson 2013 and the references there.

On this approach, thus, the vP-phase relates to (or "agrees with") the CP-phase via grammatical elements in the T-domain (most centrally Tense and Person). In the next section, I will demonstrate how Tense computation adheres to this general scheme.

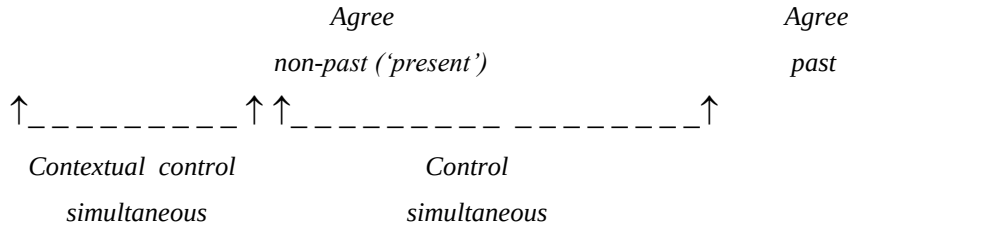
3. Anaphoric T_S

In the unmarked case, T_S is *deictic* (much as indexical pronouns prototypically are deictic). For example, this is the case for both the matrix and the subordinate clauses in (13).

(13) a. [Peter:] This morning I discovered that Mary will leave in a week.
b. [Peter:] Mary works tonight because Susan left in the afternoon.

The Tense structure of (13b) in shown in (14) ($T_R = T_E$ in both CPs).

(14) NOW [$_{CP}$ … T_{S1} ... … works-T_{E1} … [$_{CP}$ … T_{S2} ... … left-T_{E2} …



As shown, both T_{S1} and T_{S2} are set as identical or simultaneous with NOW under control (direct contextual control in the matrix CP, indirect syntactic control in the subordinate CP). Thus, the matrix event of WORKING and the subordinate event of LEAVING both acquire their temporal reading (here non-past vs. past) in relation to the fundamental speaker NOW.

However, in some widely discussed contexts, subordinate T_S is shifted. Kiparsky (2002) refers to shifted T_S as "perspective time," which is a nice pedagogical term, but as I have argued in previous work (e.g. Sigurðsson 1990, 2004b, 2013), the shifted T is really a perceived secondary Speech Tense (serving as an additional T_R for the subordinate $T_R \leftrightarrow T_E$). In the following, I will take a closer look at T_S Shift. As we will see, it crucially involves a shift of embedded T_S under control by a matrix T head, the embedded T_S thereby becoming

anaphoric in relation to a locally c-commanding superordinate element.[8] In this respect, the behavior of Tense parallels the behavior of Person in so-called indexical shift phenomena (see, most recently, Sigurðsson 2013; cf. Schlenker 2003, Bianchi 2006, Anand 2006). As we will also see, T_S Shift is commonly masked by overt morphological Tense Agreement, a fact that has caused much confusion in the literature.

3.1 Sequence of Tenses (SOT)

T_S Shift is observed in Sequence of Tenses, as in (15).[9]

(15) I **realized** that it **was** Mary (when I said hello). *English*

(16) %Maria **krävde** att vi **läste** boken (nästa dag).[10] *Swedish*
Mary demanded that we read book.the (next day)
'Mary demanded that we would read the book (next day).'

The matrix and the subordinate verbs form a sequence of past tense, hence the term Sequence of Tenses, SOT for short. The phenomenon is sometimes referred to as Tense Agreement, a slightly more pertinent term (see, e.g., Anderson 1990). Both notions are formal or morphological. Semantically, the subordinate clauses in (15) and (16) have a shifted tense reading, such that the past forms *was* and *läste* 'read' are not past but present or non-past in relation to the matrix event of saying. That is, semantically and syntactically, (15)–(16) illustrate T_S Shift, with a NON-PAST-IN-THE-PAST reading.[11] This reading is a regular property of subordinate past subjunctives in many languages. Example (17) is Icelandic.

(17) María **sagði** [að Ólafur **væri** veikur (*í gær)]. *Icelandic*

[8] Usually T_E, but T_R in certain exceptional cases (discussed in Sigurðsson 1990:329–330).

[9] SOT phenomena have been so widely discussed that it is almost pointless to mention some specific references, but see, for example, Enç 1987, Hornstein 1990, Giorgi and Pianese 1995, Abush 1997, Schlenker 2004, Giorgi 2010.

[10] The percent sign indicates variable acceptance. Some speakers prefer the periphrastic *skulle läsa* 'would read.'

[11] While the copula and other stative predicates typically get a PRESENT-IN-THE-PAST reading in SOT, dynamic predicates like *read* typically get a FUTURE-IN-THE-PAST reading. Both readings are subsumed under a general NON-PAST-IN-THE-PAST reading (parallel to the simple present).

Mary said that Olaf were.**PST**.SBJ sick (*in yesterday)
'Mary said that Olaf **was** sick (*yesterday).'[12]
(= sick at the moment of Mary's saying so).'

The Tense structure of (17) is illustrated in (18) (basically the same analysis applies to (15) and (16)).

(18) NOW [$_{CP}$ … T_{S1} **...** … said-T_{E1} … [$_{CP}$ … T_{S2} **...** … sick-T_{E2} …

↑_ _ _ _ _ _ _ _ _ ↑↑_____↑↑_ _ _ _ _ _ _ _ _ ↑↑_____↑

Contextual control *Agree* *Control* *Agree*
simultaneous *past* *simultaneous* *non-past ('present')*

That is, what is "past" in the past subjunctive is not the sickness eventuality (T_{E2}), but T_{S2} (the perspective time in Kiparsky 2002). While T_{S1} is deictic, T_{S2} is *anaphoric*, and the past tense of the embedded verb (*væri* in (17)) gets its form by uninterpretable morphological agreement, being semantically non-past with respect to the shifted T_{S2} (and the matrix T_{E1}).

This kind of uninterpretable Tense Agreement is even found in some infinitival complements. This is illustrated for Icelandic in (19).

(19) a. María **segist** þá **munu** fara. *Icelandic*
Mary says-herself then will.INF go PRES.IND – PRES.INF
'Mary (then) says that she will (then) go/leave.'

b. María **sagðist** þá **mundu** fara. PST.IND – PST.INF
Mary said-herself then would.INF go
'Mary (then) said that she would (then) go/leave.'

That is, meaningless Tense Agreement can be passed down into certain complement structures, seemingly in a top > bottom externalization process. As will be briefly discussed in section 4, case agreement sometimes behaves in a parallel manner.[13]

[12] I.e., the narrow scope reading of *yesterday* is out (the wide scope reading is irrelevant).

[13] Inasmuch as this kind of top > bottom feature copying is a general PF phenomenon, it casts serious doubts on the relevance of the Brazilian Portuguese infinitival agreement data that have been commonly assume to lend support to the Movement Theory of Control (see Boeckx et al. 2010).

3.2 Double Access Reading (DAR)

Double Access Reading (see, e.g., Schlenker 2004, Anand & Hacquard 2007, Giorgi 2010) is another relevant issue in the present context. It is demonstrated in (20) for English, in (21) for Italian, and in (22) for Icelandic.[14]

(20) [Anna:] John knew that Mary **is** sick. *English*

(21) [Anna:] Gianni ha saputo che Maria **è** malata. *Italian*
John has known that Mary is.IND sick
[Anna:] 'John knew that Mary is sick.'

(22) [Anna:] Jón vissi að María **er** veik. *Icelandic*
John knew that Mary is.IND sick
[Anna:] 'John knew that Mary is sick.'

The term "double access" refers to the fact that the subordinate event time or T_E (Mary's sickness eventuality) is temporally accessible to both the matrix T_E of John's knowing and the matrix T_{S1} (the time of the speaker's utterance, here Anna's). That is, Mary's sickness holds at both the time of John's knowing about it and Anna's time of telling somebody about this knowledge of his. Mary could for instance have been sick for the last six months when Anna tells somebody that John knew about her extended illness 2 months ago (he of course could not know that it would extend to the time of Anna's telling about this, but both Anna and her hearer know that it has).

Compare (22) and the examples in (23) and (24).

(23) [Anna:] Jón vissi að María **var** veik. *Icelandic*
John knew that Mary was.IND sick
[Anna:] 'John knew that Mary was sick.'

[14] DAR is more restricted in Icelandic than in English and Italian as it is excluded from the complements of verbs of saying and thinking (which take an obligatory subjunctive in Modern Icelandic, as opposed to Old Norse and, e.g., Italian; see Sigurðsson 2010).

(24) [Anna:] Jón vissi að María **væri** veik. *Icelandic*
John knew that Mary were.**PST**.SBJ sick
[Anna:] 'John knew that Mary was sick.'

In (23), Mary's sickness is either prior to or simultaneous with the time of John's knowledge, both the sickness and the knowledge times being prior to the moment of Anna's utterance (no double access). The example in (24), in turn, has an obligatory SOT reading; that is, Mary's sickness is simultaneous with John's knowledge, both being past in relation the moment of Anna's utterance (again, no double access).[15] The DAR in (20)–(22) conflates this "subjunctive" SOT reading and the plain present "indicative" reading in (25), where the times of Anna's saying, John's knowledge and Mary's sickness are all simultaneous.

(25) [Anna:] John knows that Mary is sick.

The Tense structure of the double reading of (20)–(22) is illustrated in (26), where (26a) is the "subjunctive" reading and (26b) the "indicative" one. For simplicity, I do not show contextual control, nor do I show the Agree (past) relation between the matrix T_{S1} and T_{E1} in the "indicative" reading. As shown, there is no computational relation between T_{E1} and T_{S2}/T_{E2} in the "indicative" reading.

(26) a. $[_{CP}$ … T_{S1} **...** … knew-T_{E1} … $[_{CP}$ … T_{S2} **...** … sick-T_{E2} …

Agree *Control* *Agree*
past *simultaneous* *non-past ('present')*

b.

Control *Agree*
simultaneous *non-past ('present')*

Basically, then, Double Access Readings are not single readings but two (simultaneous) distinct readings of two distinct clausal/temporal structures.[16] Notably, the "subjunctive" reading in (26a) sets the subordinate eventuality (sick-T_{E2}) as simultaneous with matrix

[15] This is a temporal bound variable reading.

[16] The two readings obligatorily go together (Giorgi 2010:18–19); that is, they cannot be teased apart and disambiguated.

eventuality (knew-T_{E1}), without copying the past morphology of the matrix verb onto the subordinate verb (which, in contrast, is what happens in SOT, as in (24), see section 3.4).

3.3 Non-SOT (absent Tense Agreement)

Non-SOT languages and split SOT languages do not apply Tense Agreement in complement clauses like the ones in (15)–(17), instead using the simple present tense, as illustrated for Russian and Japanese in (27) and (28).

(27) *Tanja* ***skazala*** *[čto ona* ***tancuet****]*. *Russian*
Tanja said that she dances (Comrie 1986:275)
'Tanja said that she was dancing
(at the moment of Tanja's saying so).'

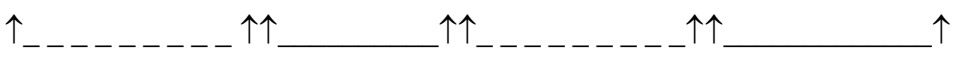
(28) *Taroowa [Hanakoga Siatoruni* ***iru****] to* ***itta****.* *Japanese*
Taro Hanako Seattle-in is that said (Ogihara 1996:5)
'Taro said that Hanako was in Seattle
(at the moment of Taro's saying so).'

Crucially, however, the present tense subordinate clauses in (27)–(28) have the same tense interpretation as the past tense subordinate clauses in (15)–(17): 'Non-past relative to the past saying in the matrix clause' (Kondrashova 2005). Reconsider the Icelandic example in (17) and its Tense structure in (18), repeated as (29) and (30).

(29) María **sagði** [að Ólafur **væri** veikur (*í gær) *Icelandic*
Mary said that Olaf were.**PST**.SBJ sick (*in yesterday).
'Mary said that Olaf **was** sick (*yesterday)[17]
(= sick at the moment of Mary's saying so).'

[17] I.e., the narrow scope reading of *yesterday* is out (the wide scope reading is irrelevant).

(30) NOW [$_{CP}$ … T_{S1} ... … said-T_{E1} … [$_{CP}$ … T_{S2} ... … sick-T_{E2} …



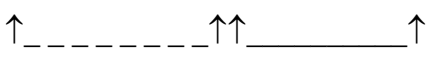
Contextual control *Agree* *Control* *Agree*

simultaneous *past* *simultaneous* *non-past ('present')*

Evidently, in SOT examples of this sort in Icelandic morphology, uninterpretable morphological +PAST is silently copied onto T_{S2} under control and spelled out on the verb in T_{R2} under PF-agreement with T_{S2}, as sketched in (31).

(31) [$_{CP}$ … said-T_{E1} … [$_{CP}$ … T_{S2} ... … T_{R2}/sick-T_{E2}

+PAST +PAST



Control *PF-agreement*

This morphological agreement process is not operative in the Russian and Japanese examples in (27) and (28); that is, Russian and Japanese are morphologically different from but syntactically similar to Icelandic, English, etc.

4. Concluding remarks on the syntax-PF correlation

Tense Agreement (overt SOT) behaves like a reflex of sorts, utilizing a syntactic control relation between T_{E1} and T_{S2} as a kind of a path or a gateway to pass down the morphological tense value from the matrix verb. Strikingly, the value in examples like (15)–(17) is *shifted* (+PAST), while the syntactic control relation between T_{E1} and T_{S2} establishes an *unshifted* identity relation (as control relations generally do; here, the identity is temporal simultaneity). Tense Agreement is thus quite distinct from the syntactic matching processes (Control/Agree) that yield tense interpretation.

- Tense Agreement operates with non-syntactic features (morphological +PAST, etc.)
- Tense Agreement evidently utilizes a Control/Agree path (already laid in the syntactic *bottom > top* derivation) in a directional *top > bottom* externalization PF process

Much the same behavior is seen in other meaningless (uninterpretable) agreement phenomena, including, for example, NP-internal concord and optional case agreement of Icelandic PRO, illustrated in (32)–(33) (see Sigurðsson 2008 and the references cited there).

(32) Hún bað Ólaf [að PRO fara bara **einan** í veisluna].
she.NOM asked Olaf.ACC to go just alone.ACC to party.the
'She asked Olaf to just go alone to the party.'

(33) [$_{CP}$ … Olaf.ACC ... [$_{CP}$ … PRO ... … alone.ACC ...][18]
↑_____↑↑_____↑
Control *PF case agreement*

Like overt Tense Agreement, case agreement is semantically vacuous. That is, there are no semantic differences between the Acc *einan* 'alone' in (32) and the Nom *einn* 'alone' in (34).[19]

(34) Hún bað Ólaf [að PRO fara bara **einn** í veisluna].
she.NOM asked Olaf.ACC to go just alone.NOM to party.the
'She asked Olaf to just go alone to the party.'

Overt agreement processes in general are PF processes (Sigurðsson 2004a, 2006, etc., Bobaljik 2008), taking place in the post-syntactic externalization component of language, out of sight for syntax and semantics. Accordingly, overt agreement reflects syntax but has no syntactic or semantic import. Simple data from well-documented languages further substantiate this conclusion (see the documentation of the extensive meaningless agreement variation across the Germanic languages in previous work, e.g. Sigurðsson 2004a). Thus, inasmuch as speakers of English accept clauses like *The girls **is** here* (see Henry 1995), they arguably have abstract Agree, only lacking overt PF agreement.

[18] Regardless of how one analyzes control, the syntactic and the morphological deriavations are quite distinct (the latter only indirectly bearing on the former).

[19] In general, locally licensed NOM is the unmarked option in Icelandic PRO infinitives, but object controlled ACC (as opposed to the more marked subject controlled ACC, object controlled DAT, etc.) is also unmarked and widely acceptable (see Sigurðsson 2008:414).

The mapping from abstract internal language to perceptible external language is fundamentally non-isomorphic. While syntax builds relations, for example, relations between distinct Tense heads (i.e., between phases), PF reinterprets and expresses these relations as morphological and perceptible units or items (audible, visible, tactile, or combinatory, depending on the externalization mode). Lexical approaches (including Chomskyan lexicalism or "itemism" and Distributed Morphology), make (variable) sense as partial models of externalization, but they do not make sense as theories of internal syntax–the system of linguistic thought. Internal language operates with abstract minimal roots and atomic features, such as T_S, T_R, and T_E, constructing relations between such elements, whereas external language expresses discrete items such as English *sang* and *-ed*.

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