Götz Keydana*

Language change and the actuation problem: grammaticalization in Vedic Sanskrit

https://doi.org/10.1515/jsall-2023-1007
Published online July 3, 2023

Abstract: One of the structures denoting the future in Sanskrit is the so-called *-tā́-* future, based on an agent noun and a present tense copula. Typologically, this grammaticalization path is unique. In this paper, this astonishing fact is tied to another unique feature of hysterotone *-tŕ̥-*nouns, their situative semantics, which forces a presupposition relating the event depicted by the noun to another event taken from the context. In ambiguous contexts, this relation could be (re-)interpreted by hearers as one between the event and the speech act itself. The grammaticalization, then, is hearer-based and triggered by semantic reanalysis. The process is essentially identical to phonemicization. The scenario developed in this paper thus further strengthens the position that grammaticalization is ontologically not distinct from other types of language change based on speaker–hearer interaction.

Keywords: actuation; grammaticalization; Sanskrit; semantic reanalysis; *-tā́-*future

1 Introduction

The so-called *-tā́-*future, an analytic finite verb form based on an agent noun and the copula, is a remarkable innovation of Sanskrit.[1] In this paper, a scenario for the actuation of the grammaticalization process behind this form is proposed. In Section 2, I give an overview of the state of affairs in Late Vedic and Classical Sanskrit. Section 3 describes the Early Vedic system, while Section 4 gives an account of the actual actuation and the proposed reanalysis. In Section 4.3 a parallel from phonology is

1 Only after this paper was accepted for publication in *JSALL* was Fries' (2021 [2023]) article on the *-tā́-*future published. The paper contains a very detailed and highly valuable overview of the functions of this construction. The diachronic account presented by Fries follows and expands on Tichy (1992, 2006), on which see below.

***Corresponding author: Götz Keydana**, Sprachwissenschaftliches Seminar, Georg-August-Universität Göttingen, Käte-Hamburger-Weg 3, 37073 Göttingen, Germany, E-mail: gkeydan@gwdg.de

introduced to show that grammaticalization is in no way ontologically different from other diachronic developments. The paper ends with a short conclusion (Section 5).

2 How to talk about the future in Sanskrit

In Late Vedic and Classical Sanskrit, two means of expressing future tense exist. One is the synthetic *-sya-*future, the other the periphrastic *-tā́-*future. The latter is based on the NOM.SG or NOM.PL of an agent noun in *-tṛ́-*, thus SG. *-tā́*, PL. *-tā́raḥ*, combined with a copula in the indicative of the present tense in the 1st and 2nd person. The building blocks of this analytic future were most probably transparent to native speakers, as they existed independently in the language. Still, this future is clearly fully grammaticalized. Evidence comes from various observations. When used as part of the analytic form, the agent noun shows reduced agreement. Plural agreement is only attested in the 3rd person as it lacks a copula that encodes the number feature in the 1st and 2nd person. Gender is not instantiated at all: the masculine form is used throughout, although in principle the agent noun allows for gender distinction. While proper agent nouns outside the future construction cannot be formed from verbs denoting states such as *bhav*^{i} 'become', forms like *bhavitā́* are feasible in the analytic future. Finally, analytic futures are always attested with VP-syntax (Lowe 2017: 133). This last point is, however, slightly weaker than the first three, as the akrotone deverbal agent nouns of Early Vedic and some deverbal adjectives, e.g. reduplicated *i*-stems, share this property (see Section 3.2).

It should be noted that throughout the history of Sanskrit the agent noun in *-tṛ́-* remains productive. Thus, a sentence like the following is ambiguous as it may be a present tense with a predicative agent noun or an analytic future:

(1) *kartā́=asi*
maker:NOM=be:PRS.2SG
You are a man of action.
Or: You will make [it].

Beginning with the Indian grammarians, there is a general consensus that the synthetic and the analytic futures had slightly different semantics. Pāṇini (ed. Katre [1987]: 277) notes the following on the semantics of the *-tā́-*future:

(2) *anadyatane* *luṭ*
NEG.today:ADJ.LOC endings.of.the.periphrastic.future
[When the action refers to the general future time (*bhaviṣyati* 3)] excluding the current day, endings of the periphrastic future are used.
(*Aṣṭādhyāyī* III, 3, 15)

The Western tradition follows Pāṇini. Speijer (1886: 259) states that "[i]t is therefore a remote future. The future in *-syati*, on the other hand, is the general future, and may be used of any future action, whether intended or not, whether actual or remote." Delbrück (1878: 7) argues that *-tā́* "auf den sicheren Eintritt eines Ereignisses in der Zukunft hinweist" [indicates the certain occurrence of an event in the future], while *-syati* "die Absicht des Subjects der Handlung ausdrückt" [expresses the intention of the subject of an action] (1878: 9). In his *Altindische Syntax* he is more cautious, claiming that "[e]s [sc. the *-tā́*-future] wird gebraucht, wenn man sagen will, dass etwas in einem bestimmten Zeitpunkt der Zukunft eintreten wird" [it is used to say that something will happen at a certain point in the future] (Delbrück 1888: 295). Gonda (1957: 163) adds that temporal adverbs are frequent with the analytic future, though not obligatory. The latter observations point to the importance of a reference point for the semantics of the *-tā́*-future (see below). Gonda (1957: 166) further claims to have observed that it implies a "Fait-accompli-Darstellung" [representation as a fait accompli] with a high degree of certainty. Kölver (1982) is more cautious. He correctly remarks that "we find *adyá varṣiṣyati*, but *śvo vraṣṭā́*. Now there can be no doubt the rain is being expected with the same degree of certainty for both days" (Kölver 1982: 142).

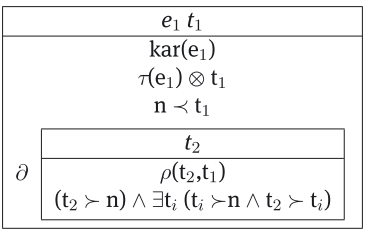
Renou (1938: 128) adds another important observation: "[L]e future en *-tā́* fonctionne presque exclusivement dans le discours" [the future in *-tā́* is used almost exclusively in discourse]. This is corroborated by Hara's (1987–1988) study on the frequency of the *-tā́*-future in Epic Sanskrit. Thus, the well-established fact that the 1st and the 2nd person are much more frequent than the 3rd is not a property of the construction itself (and as a consequence gives no clue as to its origin), but rather a consequence of its use.

Concerning its origin, Gonda (1957: 176) proposes that the construction emerged under the influence of a Dravidian adstratum. Tichy (1992) (and later Tichy 2006: 310) assumes that the *-tā́*-future is in complementary distribution to the (imminent) future in *-syati* and thus fills the slot of the prospective subjunctive of old: "Notlagen […] begünstigen das Aufkommen von Periphrasen" [emergencies encourage the emergence of periphrastic constructions] (Tichy 1992: 342). This proposal is not backed by the data. It should further be noted that there is no evidence that the *-sya-*future is associated with the notion of imminence (see Speijer and Delbrück). Also, grammaticalization is hardly ever a response to emergencies.[2]

2 Most grammaticalizations belong to a type called "renouvellement" by Meillet (1915), "renovation" by Lehmann (2015: 22) and "renewal" by Hopper and Traugott (2003) who state that "[r]ather than replace a lost or almost lost distinction, newly invented forms compete with older ones" (Hopper and Traugott 2003: 124). Typical examples are the English *going to* future, which developed despite the existence of other (analytic) futures, or the German modal *nicht brauchen* besides the older semantically equivalent *nicht müssen*.

In Section 4 it is proposed that the grammaticalization of the *-tắ*-future is based on a semantic reanalysis. It will be shown that every constituent of the original structure contributes compositionally to the semantics of the new future. To model this reanalysis as precisely as possible, I close this section by giving a formal account of the temporal semantics of the *-tắ*-future in terms of a discourse representation structure (DRS: Genabith et al. 2005; Kamp and Reyle 1993). The DRS in (3) represents *kartắ* 'is going to make':

(3)



In its first line, (3) states that *kartắ* introduces two discourse referents relevant to its temporal interpretation, the event e_1 and the topic time t_1. The latter is the time talked about, or, in the words of Klein (2009), the assertion time. Conditions on these referents are given below the solid line. The first DRS condition identifies e_1 as a *kar*-event. The second introduces a function τ that maps events onto their temporal traces. This function is necessary to model the fact that a *kar*-event has a certain duration. $\tau(e_1)$ is thus the time the event e_1 takes up. $\otimes$ is an overlap relation. $\tau(e_1) \otimes t_1$ simply states that the event time and the topic time overlap. This relation between event and topic time is the neutral aspect. Modeling aspect is important since, as will be shown in Section 3.1, in Early Vedic it was possible to distinguish different aspects when talking about the future. The last condition above the box accounts for the future: it states that the topic time follows the time of the speech act.

In this analysis, the *anadyatane*-restriction is treated as a presupposition. In DRSs, presuppositions are introduced by ∂. The presupposition introduces another discourse referent, t_2. This is the reference time, which is provided by the context (or by a frame adverb like *śvas* in Kölver's example quoted above). The first condition of the inner DRS box states that the topic time and the reference time are in some temporal relation ρ, be it anteriority, simultaneity, or posteriority. The exact nature of the relation again depends on the context. The second condition is a way of formalizing remoteness. It states that the reference time, t_2, is posterior to the speech act, *n*, and that the two of them are not immediately adjacent (given the granularity of the discourse), because some time t_i intervenes between the time of the speech act and the reference time. The diachronic sketch developed below does not account for this presupposition.

Evidently, the most surprising fact about this periphrastic future is its formal make-up. How does an agent noun turn into a future? The pattern is even more striking as it (and the grammaticalization path behind it) is to my knowledge typologically isolated. There are no comparable data e.g. in Kuteva et al. (2019).[3]

In the next sections, I present a scenario for the actuation process leading to the development of the *-tā́*-future. But to do so, we first have to turn to the stage of Vedic preceding this change, Early Vedic.

3 The starting point: Early Vedic

3.1 The Early Vedic future

The Early Vedic system differed slightly from that of later stages of the language. Most importantly, Early Vedic had a fully productive subjunctive with a prospective use (Tichy 2006). As the subjunctive could be formed from all aspect stems, aspectual differences could be expressed in rendering future events. Besides the inherited subjunctive, Early Vedic also had the more recent synthetic *-sya*-future mentioned above. It is based on an old desiderative and still quite rare in the Rigveda, where it is attested with no more than 15 verbal roots. In the Atharvaveda, it is already more frequent (>30 roots). A third way of expressing the future was the use of the so-called gerundive, a future passive participle, in nominal or copula sentences.

3.2 Early Vedic agent nouns

Vedic agent nouns are formed from the full grade root with an ablauting suffix *-tar-/-tr̥-* (Kim 2005; Kiparsky 2016; Lühr 2005; Tichy 1995). They come in two types, hysterotones with accent on the affix and akrotones with accent on the root.

The akrotone agent noun is rare from the onset. It shows verbal phrase syntax: with nouns derived from transitive verbs, the theme stands in the accusative. There is a general consensus as to its core temporal semantics. Akrotone agent nouns denote a “présent général, duratif” [general present, durative] (Renou 1938: 108), a “generelle Funktion” [general function] (Tichy 1995: 223), or, in the words of Kiparsky (2016: 173–174), a “habitual/generic meaning”, “restricted to actions performed *vartamāne*, ‘at the current time’.” From the Atharvaveda on, the type merges into the hysterotone, and the VP-syntax vanishes.

3 The Latin future active participle is not based on an agent noun, see most recently Fortson (2007).

Hysterotone agent nouns always show noun phrase syntax. With nouns derived from transitive roots, the theme surfaces as a modifier in the genitive. Their semantics are slightly disputed. Renou (1938: 111) argues that they denote an "aspect ponctuel" [punctual aspect]. In a similar vein, Tichy (1995: 105) claims that they are "situationsgebunden" [situative], meaning that they do not denote a general property, but rather that a referent participates in a specific event. Kiparsky (2016: 174), on the other hand, states bluntly that "*-tár-* has no additional meanings, only the general meaning of agency." Kiparsky's assessment, however, is a bit simplistic. He is right that *-tŕ̥-*stems are not categorically situative. The affix can, for example, be used in occupational titles like *jaritár-* 'singer of praise' or *stotár-* 'id.'[4] Cf. the following example:

(4) *átha yát táto yajñáṃ tanváte. tád yanti.*
and when then sacrifice:ACC stretch:PRS.MID.3PL then go:PRS.3PL
tán nayati yó netā́ bhávati sá
then lead:PRS.3SG who:NOM leader:NOM be:PRS.3SG this:NOM
And when they perform the sacrifice then, then they go. Then the one who is the [designated] leader leads them.
(Śatapatha Brāhmaṇa IV 6.8.1)

Here, a situative reading is excluded as it would lead to a tautology since *netā́* and *nayati* would refer to the same event.

But in the vast majority of cases, nouns in *-tŕ̥-* do have a special semantics: they typically denote participation in an event which is situated relative to the event depicted by the matrix verb. In the terminology of Levin and Rappaport (1988), they are used as *event-agent nouns*.[5] A clear example is (5), the last two half-verses from a spell against snakebites (Renou 1938: 111):

(5) *agnír viṣám áher nír adhāt sómo nír*
Agni:NOM poison:ACC serpent:GEN out put:AOR.3SG soma:NOM out
aṇayīt | daṃṣṭáram ánv agād viṣám áhir
lead:AOR.3SG chopper:ACC back go:AOR.3SG poison:NOM serpent:NOM
amr̥ta
die:AOR.3SG

4 It should, however, be noted that occupational titles are more frequently akrotone like *hótar-* 'instigator of a sacrifice'.

5 English agent nouns are typically non-event stage level or individual level predicates. As such, they may be used independently of actual events. Thus, one can be a reader without reading at the reference time. It should also be noted that cross-linguistically, event-agent nouns tend to have VP-syntax, opposite to the situation in Vedic.

> Agni has found the poison of the snake. Soma has drawn it out. The poison has returned to the one who bit. The serpent has died.
> (Atharvaveda 10.4.26)

The spell is spoken on the occasion of a treatment against a specific snake bite and the last verse summarizes the successful therapy. Thus, it is exactly the serpent who participated in this specific biting event that the last halfverse addresses. This analysis is corroborated by the use of the aorist indicating an immediate past. The temporal semantics of situative *daṃṣṭár-* in (5) is given in the following DRS. Again, the formalization is necessary as the situative reading will be taken as the starting point of the grammaticalization of the *-tā́*-future in Section 4 below.

(6) $\lambda Q.\lambda e[$ | e_1 t_1 | daṃś(e$_1$) | τ(e$_1$) $\otimes$ t$_1$ | ρ(t$_1$, τ(e)) | $\oplus Q(e)]$

As in (3), t_1 is the topic time. e_1 is defined as the biting event by the first condition. The second condition again denotes neutral aspect. The last condition states that there is some temporal relation between the topic time and another event *e* which serves as the reference time. This event is introduced by *Q*, a variable over a property. In the case of (5), *e* is the *ánu gā* 'returned' event of the matrix sentence, which is merged with the *daṃṣṭár* 'who bit' DRS to form a complex DRS. This is indicated by ρ(t$_1$, τ(e)). In (5), the relation *ρ* between e_1 and the *ánu gā* event is one of anteriority. However, as the following examples show, simultaneity or posteriority are likewise possible, depending on the context.

The following two examples illustrate simultaneity, both with converbal (7) and adnominal (8) use of the agent noun:

(7) *só* *asnātr̥n* *apārayat* *s$_u$vastí*
he:NOM NEG.swimmer:ACC.PL cross:CAUS.IPF.3SG safely
… he made them cross safely without them sinking.
(Rigveda 2.15.5)

(8) *píbā* *sómam* *indara* *mándatu* *tvā*
drink:IPV.2SG soma:ACC Indra:VOC cheer:IPV.3SG you:ACC
yáṃ *te* *suṣáva* *har$_i$yaśv$_a$* *$_á$driḥ* *sotúr*
who:ACC you:DAT press:PRF.3SG of.bays:VOC stone:NOM presser:GEN
bāhúbhyāṃ *súyato* *n$_á$* *$_á$rvā*
arm:INS.DU well.guided:NOM like horse:NOM

Drink Soma, Indra! It shall cheer you, [the one] whom the stone pressed for you, you of the bays, [guided] by the arms of the one who pressed like a well-guided steed.
(Rigveda 7.22.1)

A second example for an anterior reading is (9), while the posterior reading is illustrated by (10):

(9) *śvā́nam bastó bodhayitā́ram abravīt*
dog:ACC goat:NOM wake:AG.ACC say:IPF.3SG
The goat said the dog wakened them.
(Rigveda 1.161.13)

(10) *táyor ādityā́ nirhantā́ram aichaṃs.*
they:GEN.DU Āditya:NOM.PL abort:AG.ACC seek:IPF.3PL
tā́ áṃśaś ca bhágaś ca nírahatām
they:ACC.DU Aṃśa:NOM and Bhaga:NOM and abort:IPF.3DU
The Ādityas looked for someone who could abort them. Aṃśa and Bhaga aborted the two.
(Maitrāyaṇīya Saṃhitā I 6.12:104, 15)

Note that in (10) *táyor* is a theme and thus evinces the event-reading.

But what happens if no reference time is given in the sentence? This is the case of predicative *-tŕ̥-*nouns in copula sentences. Cf. (11):

(11) *taṁ ha tad eva vicichidatus. tasmin hodāte.*
he:ACC PTCL then PTLC rip.apart:PRF.3DU this:LOC PTCL=speak:PRF.MID.3DU
tvaṁ hantāsi, tvaṁ hantāsīti.
you:NOM killer:NOM=be:PRS.2SG you:NOM killer:NOM=be:PRS.2SG=so
Then they ripped him to pieces. They argued about it: You killed him! [No], You killed him!
(Jaiminīya Brāhmaṇa III 94)

Copula sentences lack a reference point given in the sentence. This problem, however, is resolved in that situative *-tŕ̥-* triggers the presupposition that there is some event *e* available in the discourse which is the reference point to the *-tŕ̥-*event. Presupposition resolution depends on world knowledge and context. In (11), the reference point is the speech act introduced by the preceding sentence. The relation between the two events is one of anteriority. This anterior reading is possible despite

the use of a present tense copula, since depending on the context the present tense may be interpreted as a future or as a past (Delbrück 1888: 278–279).[6]

We are now able to give a general account of the temporal semantics of situative -*tŕ̥*-nouns:

(12) λP [$e_1\ t_1$ | $P(e_1)$; $\tau(e_1) \otimes t_1$; ∂ [t_2 | $\rho(t_1, t_2)$]]

In (12), *P* is a variable over all possible -*tŕ̥*-nouns. They introduce an event e_1, the topic time t_1 and again neutral aspect. On top of that, they trigger a presupposition, which is marked by ∂ as in (3) above. The presupposition introduces a reference time t_2 and the condition that there is some temporal relation between t_1 and t_2.

4 Actuation

4.1 The source

There are three possible sources for the grammaticalization process turning copula sentences with agent nouns into a future tense. The starting point may be the akrotone agent noun, the hysterotone agent noun, or both. The akrotone is attractive since like the prospective new future it shows VP-syntax. On the downside, it has accent on the root, while the future is almost always accented on the affix – if the accent is transmitted at all. On rare cases of akrotone futures see Lowe (2017: 135). Another argument against an akrotone source is its semantics, since according to Pāṇini (and most recently Kiparsky 2016: 173–174) it is restricted to *vartamāne*, i.e. the present tense. But the most important reason to dismiss the akrotone as the source of the periphrastic future is much more straightforward: already in the times of the Atharvaveda, the akrotone, and with it its verbal syntax, had vanished. The emergence of the periphrastic future, on the other hand, is clearly a post-atharvavedic development. Thus, the only possible scenario starts with the hysterotone. VP-syntax, then, is not a case of persistence, but rather a consequence of the integration of the new future into the verbal paradigm.

6 Pāṇini restricts this use to events which are *vartamāna-sāmīpye* 'proximate to the present tense' but there is no way to tell if this claim is grounded in empirical observation or rather triggered by the fact that the forms are formal presents after all.

4.2 Speaker–hearer interaction

Grammaticalization is often attributed to the inventiveness of speakers (see Eckardt 2012 for a critical assessment). However, as Eckardt (2012) and others point out, it is much more likely that grammaticalization processes are a mere side-effect of the interaction between speakers and hearers and thus unintentional. The scenario developed here, which has the additional advantage of aligning grammaticalization to phonological change (see Section 4.3), follows this line of thought.

Essential to reanalyses emerging from speaker-hearer interaction is the existence of so-called bridging contexts (Giomi 2017; Heine 2002: 86). A bridging context is a situation in which the hearer may attribute the utterance she parses a structure different from the one intended by the speaker. For such a reanalysis to work it is crucial that the "misparsing" does not impair the discourse: If it would not remain felicitous, the communication would break down or the hearer would be corrected.

In the concrete case of the periphrastic Sanskrit future, a possible bridging context must fulfill the following requirements:

– As the prospective future is a copula construction, the same should hold true for its source. Since use in copula constructions is the most frequent anyway (Renou 1938: 112, 123), this is unproblematic.
– It would probably facilitate the reanalysis if the agent noun had achievement or accomplishment semantics, because "la considération d'un terme peut donner l'illusion d' un futur" [the consideration of an end point can give the illusion of a future] (Renou 1938: 108).
– Finally, the bridging context should be able to account for the fact that the typologically isolated grammaticalization of an agent noun into a future marker occurred in the first place. A feature of the hysterotone agent noun which is unique in a manner similar to the grammaticalization path from agent noun to future tense is its situative primary reading. Therefore it is highly probable that it was this feature which triggered the change. Thus, it seems that a necessary prerequisite for the reanalysis is a situative reading or the possibility thereof.

Contexts fulfilling these requirements can actually be found in Early Vedic. An example for a possible bridging context in the Rigveda is (13):

(13) *vibhaktā́si* *citrabhāno* *síndhor* *ūrmā́*
distributor:NOM=be:PRS.2SG bright.beamed:VOC Sindhu:GEN wave:LOC
upāká *ā́* | *sadyó* *dāśúṣe* *kṣarasi*
near:LOC to instantly worshipper:DAT flow:PRS.2SG
You are a donor, oh bright-beamed one! Nearby, as on a wave of Sindhu you flow to the worshipper instantly.
Or: You will give away [gifts], oh bright-beamed one! Nearby, as on a wave of Sindhu you flow to the worshipper instantly.
(Rigveda 1.27.6)

As indicated by the alternative translations given, two different readings intended by the speaker are conceivable for (13). Under the first reading, *vibhaktár-* is a generic state-level predicate similar to an occupational title. *Vibhaktási*, then, is to be understood as a proper present tense. Under the second reading, the agent noun has situative semantics. This is indeed feasible, since the context of the sacrifice allows for an event-related interpretation: The donation is actually part of the ritual. This reading may further be promoted by the fact that the addressee, Agni, the holy fire, is permanent only on the abstract level of general types. The fire kindled during the ritual is a token of this type, but since the ability to donate is a direct consequence of the kindling, it seems likely that the actual instantiation of Agni is invoked as such. In this interpretation, the situative reading becomes unavoidable. The content of the main sentence invites a futurate reading since the worshipper receives gifts only after Agni comes to him. As mentioned above, this is unproblematic as the present tense allows for future and past readings.

The frame adverb *sadyáḥ* further strengthens the argument for a situative reading. In most attestations in the Rigveda, this adverb presupposes an event which precedes the event the adverb scopes over. Thus, Witzel (in Witzel and Gotō 2007), following Geldner (1951), translates it as 'sogleich.'[7] In the framework developed above, this means that t_2 equals n or follows n immediately, thus forcing an interpretation of t_1 as related to n. See Figure 1.

The timeline given in Figure 1 builds on the semantics developed in (12). n is the time of the speech act. The grey section marked $\tau(e_2)$ is the time the event denoted by *dāśúṣe kṣarasi* 'you flow to the worshipper' takes up. This event is an accomplishment. t_2 is the point in time denoted by *sadyáḥ* 'instantly'. This, the reference time, is analyzed as the end point of e_2. This is the most likely interpretation. In principle, t_2 could also denote the starting point. But as this is the 6th verse and as the hymn is sung during the ritual, an inchoative reading is unlikely, especially since the part of e_2 leading up to the presence of Agni is not what the singer is interested in. As before, t_1

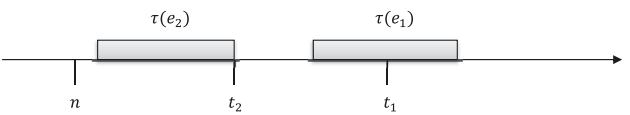


Figure 1: Temporal semantics of *vibhaktá* 'give away' with situative reading in (13).

7 Note that the relational semantics assumed here for the adverb is not the only one possible. Jamison and Brereton (2014) translate *sadyáḥ* in this case as 'all at once'. Following Jamison and Brereton, however, would not invalidate the analysis presented here. See the following footnote.

is the topic time. It lies somewhere within the extension of e_1, the event depicted by *vibhaktā́si*. This event, too, is an accomplishment.[8] $\rho(t_1, t_2)$ is interpreted as $t_2 \prec t_1$, i.e. as a precedence relation, by presupposition resolution. Since *dāśúṣe kṣarasi* is immediate, it necessarily implies a futurate reading for *vibhaktā́si*.

In the scenario developed here, this situative reading is the one intended by the speaker. Due to the context in which the utterance is made, the hearer undoubtedly grasps both the situative semantics and its consequence, the futurate reading of *vibhaktā́si*. However, in her attempt to derive this interpretation from the speaker's utterance, she is confronted with a challenge. The utterance itself is just a sequence of sounds and does not contain any cues regarding its structure and its semantics. To make sense of it, she has to infer a structure herself resorting to abductive reasoning. With Eckardt (2012) I assume that this reasoning is guided by the premise that in essence semantics is compositional.[9]

Given these assumptions, the hearer is confronted with an ambiguity when computing (13): while the posteriority of e_1 is beyond doubt, it can be derived in two different ways. The hearer may infer a presupposed relation $t_2 \prec t_1$ in line with the speaker's intention and the structure outlined in (12). Alternatively, she may attribute the futurate reading of *vibhaktā́si* to a relation $n \prec t_1$ directly encoded in the sentence. Both interpretations are indistinguishable in the interaction of speaker and hearer as they both keep the discourse felicitous. The second analysis, however, leads to change. While all else, including the neutral aspect, remains unchanged, the presupposition in (12) is turned into a novel conventional meaning. The result is a new semantic structure, the one introduced above in (3). Following the premise of compositionality, this new conventional meaning is assigned to *-tā́* + copula, which thus turns into a new future marker. Note that the present tense of the copula fits this new interpretation as it contributes to the compositional semantics by accounting for the speech act *n*.

A similar case can be made for (14):

(14)	*divó*	*dhartā́si*		*śukráḥ*	*pīyūṣaḥ* |
	heaven:GEN	supporter:NOM=be.PRS.2SG		gleaming:NOM	beestings:NOM
	satyé	*vídharman*	*vājī́*	*pavasva*	
	true:LOC	expansion:LOC	prizewinner:NOM	purify:PRS.IPV.MID.2SG	

8 In the reading of Jamison and Brereton (2014) the accomplishment is reduced to an achievement by the frame adverb. This would not affect the analysis presented here.

9 This assumption does not imply language-specific innate knowledge as assumed e.g. by van Gelderen (2004). Rather, language learners construe compositionality as a working hypothesis based on the fact that most of the data they are confronted with are compositional in nature.

> You are the supporter of heaven, the gleaming beestings. In your real expansion, as prizewinner purify yourself. (Jamison and Brereton 2014)
> Or: You will support heaven, the gleaming beestings. In your real expansion, as prizewinner purify yourself.
> (Rigveda 9.109.6)

As the second translation indicates, a situative reading of the agent noun is again conceivable. The addressee of the hymn is Soma, which, being a plant pressed in the ritual, only becomes operative (e_1) – and comparable to gleaming beestings – after the purification process (e_2). In this case, t_2 is the endpoint of the purification event, while t_1 is a point in time within the extension of the support event. As in the case of (13), presupposition resolution forces a futurate reading upon *dhartási* 'are the supporter > will support' ($t_2 \prec t_1$). And since e_2 is supposed to take place immediately after the speech act, the conditions are met for a hearer-induced reanalysis of the temporal relation as $n \prec t_1$.

But why would the reanalysis happen in the first place? A hearer, especially a learner, is likely to opt for the least costly analysis feasible in a given context. This implies that she tries to reduce the number of pragmatic computations to the unavoidable minimum (Schwarz et al. 2014; Schwenter and Waltereit 2010). This urge is even more pressing in a case like (13) and (14), as the kataphoric relation between the two events adds even more computational load: As shown by Schwarz (2007) and Tiemann et al. (2011), the lack of an antecedent significantly delays presupposition resolution.

It is important to stress that under the reanalysis stipulated here the discourse remains felicitous. As a consequence, the change goes unnoticed and there is no need for the hearer to revise her interpretation. However, turned speaker, the listener will then use the new item with its compositional semantics freely outside of bridging contexts. This will eventually lead to the integration of the new future as an inflectional form into the verbal paradigm. Full grammaticalization then manifests itself in lack of agreement and VP-syntax (but see Lowe 2017: 135, who ponders the idea that semantic reanalysis and syntactic transitivization need not go hand in hand).

This scenario raises an immediate question: Why are predicative agent nouns with situative readings not reanalyzed as a past tense? The ingredients to the reanalysis would be essentially the same. Likewise, possible bridging contexts are conceivable and would probably be found. As shown above, anterior relations between the matrix event and the agent noun are indeed attested, and the general semantics of situative agent nouns as outlined in (12) leaves the nature of the relation unspecified. One might want to resort to frequency as an answer to this rather vexed problem. However, as we know nothing about frequencies in utterances in Vedic discourse, such an approach would be futile.

But there is a difference between the past and the future in Early Vedic which may have played a crucial role. Grammaticalizations like the one discussed here are based on reanalysis. Reanalysis, however, seems to be guided by the existence of comparable patterns. Thus, postpositions are only reanalyzed into case endings in languages (like e.g. Lithuanian) which already have case endings. Similarly, the reanalysis of English *going to* or German *nicht brauchen* as auxiliaries is facilitated by the existence of other auxiliaries in the same realm (future tense and modality respectively). In Vedic, the situation is similar for the --tấfuture as periphrasis is well attested in futurate contexts from early on: the gerundive/future passive participle in *-ya-*, *-tavyà-* occurs regularly in nominal sentences since the Rigveda (Delbrück 1888: 397). We may thus hypothesize that the existence of the analytic pattern in the passive facilitated its spread to non-passive future contexts. In the past, on the other hand, the situation was strikingly different: past tense periphrasis with *-tá-*, which might have served as a foil for the development of a potential –tấpast, did not yet exist.[10]

4.3 A parallel in phonology

Above I already made the argument that grammaticalization has no ontological status as a process distinct from other types of language change. In this section, I seek to strengthen this point by giving an example from phonological change which relies on the same mechanisms as the development of the analytic future in Sanskrit sketched in this paper.

The scenario developed here for the *-tấ-*future rests on the assumption that a presupposition turns into part of the compositionally derived meaning. More generally, a systematic property of a linguistic structure which can be cancelled without compromising the interpretability of the structure itself turns into one of its core features. Phonemicization of an already phonologized but peripheral feature (Hyman 1976) is a parallel from phonology. In such cases, non-distinctive phonological features turn distinctive, resulting in a reduction of computational load. A case in point is the feature [+noise] as e.g. in the Germanic case of /p^h/ or /p^Φ/ > /f/ (see Boersma 2003 for a possible scenario). In this and comparable cases, the signal is accurately perceived by the hearer, but it is ambiguous: the perceived noise may be an accessory feature, but it may also be distinctive. If the hearer opts for the latter, change takes place (this is a case of “chance” in the terminology of Blevins 2004).

10 In Iranian, such a past did indeed emerge. I want to thank Benedikt Peschl (p.c.) for pointing out to me that *-tā-* + copula developed into a past in Ossetic (Digor), e.g. 1.SG. *baston* < **bastā ahmi* ‘I tied’, and, if we follow Tremblay (2005), in the more complex pattern of the Khotanese transitive past, e.g. 1.SG.M. *dātaimā* < **ditā hants ahmi* ‘I saw’.

Similarly, a hearer of (13) accurately perceives the utterance. But she, too, has to resolve an ambiguity: either the posterior reading is a presupposition, or it is part of the core semantics. Both in phonology and semantics, an abduction has to be made, which is guided by an analytic or cognitive bias towards a reduction of computational load (see Moreton 2008 for phonology and Schwarz and Tiemann 2017 for semantics). Note that this type of grammaticalization parallels phonemicization in that the presupposition is part of the message. Other instances of grammaticalization compare to phonologization based on coarticulation effects (Ohala 1981, 2012). For an example see Keydana (2017).

5 Conclusions

In this paper, a scenario for the grammaticalization of the *-tā́*-future in Late Vedic and Classical Sanskrit was developed. It was argued that the necessary prerequisite for this change was the fact that hysterotone agent nouns in Vedic had a situative reading. In copula sentences, this reading triggered the presupposition that there is some event in the context to which the event depicted by the agent noun is temporally related. This presupposition can be reanalyzed as part of the core semantics of the construction. This reanalysis is hearer-based. It is guided by two strategies: The more concrete strategy is that the hearer presupposes compositional semantics as a default. The other, overarching strategy is that hearers, and especially learners, prefer analyses which reduce computational load. Thus, presuppositions are avoided if their contribution to the meaning of a sentence can be attributed directly to the core semantics of constituents. It is argued that changes like that presented here are in essence identical to phonemicization. This parallel further strengthens the assumption that – while being a useful classificatory term – grammaticalization is not ontologically distinct from other processes of language change.

References

Blevins, Juliette. 2004. *Evolutionary phonology: The emergence of sound patterns*. Cambridge: Cambridge University Press.

Boersma, Paul. 2003. The odds of eternal optimization in optimality theory. In David Eric Holt (ed.), *Optimality theory and language change*, 31–65. Dordrecht: Kluwer.

Delbrück, Berthold. 1878. *Die altindische Wortfolge, aus dem Çatapathabrāhmaṇa dargestellt* (Syntaktische Forschungen III). Halle a.d.S.: Verlag der Buchhandlung des Waisenhauses.

Delbrück, Berthold. 1888. *Altindische syntax*. Halle a.d.S.: Verlag der Buchhandlung des Waisenhauses.

Eckardt, Regine. 2012. Grammaticalization and semantic reanalysis. In Claudia Maienborn, Klaus von Heusinger & Paul Portner (eds.), *Semantics: An international handbook of natural language meaning*, 2675–2702. Berlin & New York: de Gruyter.

Fortson, Benjamin W. 2007. The origin of the Latin future participle. In Alan J. Nussbaum (ed.), *Verba docenti. Studies in historical and Indo-European linguistics presented to Jay H. Jasanoff by students, colleagues, and friends*, 83–95. Ann Arbor & New York: Beech Stave Press.

Fries, Simon. 2021 [2023]. Why and how do new tense formations arise? – On the emergence of the Vedic so-called *-tā́*-future. *Historische Sprachforschung* 134. 96–165.

Gelderen, Elly van. 2004. *Grammaticalization as economy*. Amsterdam & Philadelphia: Benjamins.

Geldner, Karl Friedrich. 1951. *Der Rig-Veda. Aus dem Sanskrit ins Deutsche übersetzt und mit einem laufenden Kommentar versehen. Erster bis vierter Liederkreis*. Cambridge, MA: Harvard University Press.

Genabith, Josef van, Hans Kamp & Uwe Reyle. 2005. *Discourse representation theory*. Draft of an article for the new edition of the *Handbook of philosophical logic*. Available at: https://www.ims.uni-stuttgart.de/documents/team/uwe/Papers/DRT.pdf.

Giomi, Riccardo. 2017. The interaction of components in a functional discourse grammar account of grammaticalization. In Kees Hengeveld, Heiko Narrog & Hella Olbertz (eds.), *The grammaticalization of tense, aspect, modality and evidentiality*, 39–74. Berlin & Boston: de Gruyter Mouton.

Gonda, Jan. 1957. A critical survey of the publications on the periphrastic future in Sanskrit. *Lingua* 6. 158–179.

Hara, Minoru. 1987–1988. A note on the Ancient Indian oath (2): Use of the periphrastic future. *Indologica Taurinensia* 14. 201–214.

Heine, Bernd. 2002. On the role of context in grammaticalization. In Ilse Wischer & Gabriele Diewald (eds.), *New reflections on grammaticalization*, 83–101. Amsterdam & Philadelphia: Benjamins.

Hopper, Paul J. & Elizabeth Closs Traugott. 2003. *Grammaticalization*, 2nd edn. Cambridge UK: Cambridge University Press.

Hyman, Larry M. 1976. Phonologization. In Alphonse Juilland (ed.), *Linguistic studies presented to Joseph H. Greenberg*, 407–418. Saratoga, CA: Anna Libri.

Jamison, Stephanie W. & Joel P. Brereton. 2014. *The Rigveda: The earliest religious poetry of India*. Oxford & New York: Oxford University Press.

Kamp, Hans & Uwe Reyle. 1993. *From discourse to logic*. Dordrecht: Kluwer.

Keydana, Götz. 2017. 'Finite' infinitives in Ancient Greek. *Indo-European Linguistics* 5. 49–76.

Kim, Jeong-Soo. 2005. Die Nomina agentis auf *-tar-* im Vedischen. In Irene Balles & Rosemarie Lühr (eds.), *Indogermanische Nomina agentis* (Linguistische ArbeitsBerichte 83), 71–160. Leipzig: Institut für Linguistik, Universität Leipzig.

Kiparsky, Paul. 2016. The agent suffixes as a window into Vedic grammar. In Dieter Gunkel, Joshua T. Katz, Brent Vine & Michael Weiss (eds.), *Sahasram ati srajas: Indo-Iranian and Indo-European studies in honor of Stephanie W. Jamison*, 170–192. Ann Arbor: Beech Stave Press.

Klein, Wolfgang. 2009. How time is encoded. In Wolfgang Klein & Ping Li (eds.), *The expression of time*, 39–82. Berlin: Mouton de Gruyter.

Kölver, Bernhard. 1982. On periphrastic futures in Sanskrit. *Indologica Taurinensia* 10. 141–145.

Kuteva, Tania, Bernd Heine, Bo Hong, Haiping Long, Heiko Narrog & Seongha Rhee. 2019. *World lexicon of grammaticalization*, Second, extensively revised and updated edn. Cambridge UK: Cambridge University Press.

Lehmann, Christian. 2015. *Thoughts on grammaticalization*, 3rd edn. Berlin: Language Science Press.

Levin, Beth & Malka Rappaport. 1988. Non-event *-er* nominals: A probe into argument structure. *Linguistics* 26. 1067–1083.

Lowe, John J. 2017. *Transitive nouns and adjectives: Evidence from early Indo-Aryan (Oxford studies in diachronic and historical linguistics 25)*. Oxford & New York: Oxford University Press.

Lühr, Rosemarie. 2005. Individuen- und Stadienprädikation im Altindischen. In Irene Balles & Rosemarie Lühr (eds.), *Indogermanische Nomina agentis* (Linguistische ArbeitsBerichte 83), 161–252. Leipzig: Institut für Linguistik, Universität Leipzig.

Meillet, Antoine. 1915. Le renouvellement des conjonctions. *École pratique des hautes études, Section des sciences historiques et philologiques Annuaire 1915–1916*, 9–28. Paris: Imprimerie Nationale.

Moreton, Elliot. 2008. Analytic bias and phonological typology. *Phonology* 25(1). 83–127.

Ohala, John J. 1981. The listener as a source of sound change. In Carrie Masek, Roberta A. Hendrik & Mary Frances Miller (eds.), *Papers from the parasession on language and behavior [of the 17. regional meeting]. Chicago Linguistic Society, May, 1–2, 1981*, 178–203. Chicago: Chicago Linguistic Society.

Ohala, John J. 2012. The listener as a source of sound change: An update. In Maria-Josep Solé & Daniel Recasens (eds.), *The initiation of sound change. Perception, production, and social factors*, 21–35. Amsterdam: Benjamins.

Pāṇini. 1987. *Aṣṭādhyāyī of Pāṇini in roman transliteration*. Edited by Sumitra M. Katre. Austin, Texas: University of Texas Press.

Renou, Louis. 1938. Le suffixe védique *-tr̥-* et les origines du futur périphrastique. *Bulletin de La Société de Linguistique de Paris* 39. 103–132.

Schwarz, Florian. 2007. Processing presupposed content. *Journal of Semantics* 24(4). 373–416.

Schwarz, Florian, Jacopo Romoli & Bill Cory. 2014. Scalar implicature processing: Slowly accepting the truth (literally). *Talk presented at Sinn und Bedeutung* 19.

Schwarz, Florian & Sonja Tiemann. 2017. Presupposition projection in online processing. *Journal of Semantics* 34(1). 61–106.

Schwenter, Scott A. & Richard Waltereit. 2010. Presupposition accommodation and language change. In Kristin Davidse, Lieven Vandelanotte & Hubert Cuyckens (eds.), *Subjectification, intersubjectification and grammaticalization*, 75–102. Berlin & New York: Mouton de Gruyter.

Speijer, Jacob Samuel. 1886. *Sanskrit syntax*. Leyden: Brill.

Tichy, Eva. 1992. Wozu braucht das Altindische ein periphrastisches Futur? *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 142. 334–342.

Tichy, Eva. 1995. *Die Nomina agentis auf* -tar- *im Vedischen*. Heidelberg: Winter.

Tichy, Eva. 2006. *Der Konjunktiv und seine Nachbarkategorien. Studien zum indogermanischen Verbum, ausgehend von der älteren vedischen Prosa*. Bremen: Hempen.

Tiemann, Sonja, Mareike Schmid, Nadine Bade, Bettina Rolke, Ingo Hertrich, Hermann Ackermann, Julia Knapp & Sigrid Beck. 2011. Psycholinguistic evidence for presuppositions: On-line and off-line data. In Ingo Reich, Eva Horch & Dennis Pauly (eds.), *Sinn und Bedeutung 15. Proceedings of the 2010 annual conference of the Gesellschaft für Semantik*, 581–597. Saarbrücken: Universaar.

Tremblay, Xavier. 2005. Die Bildung des Chotansakischen agentiven Präteritums. Beiträge zur vergleichenden Grammatik der Iranischen sprachen IX. In Nikolaj N. Kazansky (ed.), *Hr̥dâ mánasā: Сборник статей к 70-летию со дня рождения профессора Л.Г. Герценберга = Studies presented to professor Leonard G. Herzenberg on the occasion of his 70th birthday*, 75–80. St. Petersburg: Nauka.

Witzel, Michael & Toshifumi Gotō. 2007. *Rigveda: Das heilige Wissen: Erster und zweiter Liederkreis. Aus dem vedischen Sanskrit übersetzt und herausgegeben von* Michael Witzel *und* Toshifumi Gotō. *Unter Mitarb. von* Eijirō Dōyama *und* Mislav Ježić. Frankfurt am Main: Verlag der Weltreligionen.