Cyclic tense: Discontinuous temporal reference in Djambarrpuyu

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Abstract  This paper presents a formal proposal for the semantics of Djambarrpuyu tense and temporal reference in Djambarrpuyu, a Yol̓u (Pama-Nyungan) variety spoken in northern Australia. On the basis of novel data, elicited in the field, it comprises the first formal treatment of “cyclic tense” phenomena, where formal devices encoding temporal remoteness are ostensibly “recycled” and posits a hypothesis about the diachronic development of cyclic tense systems.

Keywords: tense, temporality, pragmatics, Australian languages

1 Introduction

In his cross-linguistic survey of tense, Comrie (1985: 88) identifies a phenomenon (reported in Burarra [Maningrida: NW Arnhem Land] by Glasgow 1964) which he calls CYCLIC TIME REFERENCE. In languages that grammaticalise this phenomenon, the temporal intervals which license tense morphology can be thought of as being discontinuous, shown for Burarra in (1).

(1) Temporal reference in Burarra (adapted from Glasgow 1964)

a. ngu-ba-nga
   1s-eat-CONT
   ‘I am eating’ or ‘I ate recently’

b. ngu-ba-de
   1s-eat-REMOTE
   ‘I ate today’ or ‘I ate long ago’

(1a) shows that Burarra contemporary morphology appears to be licensed in a predication about the time-of-speech as well the recent past but before the day

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of speech. Descriptions of past events on the day of speech receive a different class of tense marking—the REMOTE—as shown in (1b). Crucially, the REMOTE is used also in descriptions of events further in the past; those taking place more than a week or so before speech time (Rebecca Green, pers. comm.) That is, the past domain is partitioned between CONTEMPORARY and REMOTE, although the intervals which license each of these markers are discontinuous.

Djambarrpuyŋu—a variety of Western Dhuwal (Yolŋu Matha)—is a Pama-Nyungan language spoken in northern Australia. The current work proposes a formal account of cyclic tense as it is realised in Djambarrpuyŋu on the basis of original data collected in the Ramingining community (further developing an earlier description of the system laid out in Wilkinson [1991] 2012).

1 Yolŋu Matha- and Burarra-speaking communities are close geographically—shown in 1—although are unrelated (or extremely distantly related). Shared properties in their tense semantics are likely contact phenomena.
Cyclic tense

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘EAT’</td>
<td>łuka</td>
<td>łuki</td>
<td>łukan</td>
<td>łukanha</td>
</tr>
<tr>
<td>‘RUN’</td>
<td>wanđirr</td>
<td>wanđi</td>
<td>wanđin</td>
<td>wanđinya</td>
</tr>
<tr>
<td>‘GIVE’</td>
<td>gurrupan</td>
<td>gurrupul</td>
<td>gurrupar</td>
<td>gurrupana</td>
</tr>
<tr>
<td>‘SEE’</td>
<td>nhäma</td>
<td>nhäju</td>
<td>nhäŋal</td>
<td>nhänha</td>
</tr>
</tbody>
</table>

Table 1  Realization of four categories of verbal inflection across four verbs/different conjugation classes in Djambarrpuyŋu

2 Yolŋu verb morphology

Yolŋu languages have verbal paradigms which are at least partially cognate and likely reconstructable to a proto-system (Schebeck 2001, also pilot comparative reconstruction work by Bowern 2009). All varieties have between three and six different inflectional categories; each inflection is responsible for encoding (combinations of) temporal (tense/aspect) and modal information. The Ritharrŋu-Wägilak paradigm, for example, has four inflectional categories which correspond to PRESENT, PAST and FUTURE REFERENCE in addition to a PAST POTENTIAL inflection used primarily to indicate counterfactuality (as described in Heath 1980).

The form of each inflection additionally varies depending on the conjugation class associated with a given verb stem (or derivational suffix) — authors of descriptions of various Yolŋu varieties having identified between three (e.g., Waters 1989 on Djinba & Djinba) and nine (e.g., Lowe 1996 on Gupapuyŋu) distinct conjugation classes.

In lieu of metalinguistic glosses that index the semantics of their inflectional categories, existing descriptions of western Yolŋu varieties have tended to arbitrarily enumerate each inflection, as indicated in (1).2 The apparent reason for eschewing meaningful labelling is the non-obviousness of a unified analysis of the morphology’s distributional properties/licensing conditions in these varieties.

This non-obviousness can be understood in terms of two linguistic phenomena: CYCLIC TENSE—the focus of the present paper—as well as the neutralization of a morphologized reality status (verbal mood) distinction in negative clauses (see Phillips 2021b for discussion of Djambarrpuyŋu verbal mood).

2 This tradition appears to have originated in Beulah Lowe’s work on Gupapuyŋu, see Wilkinson 1991: 336 for further discussion.
3 Temporal reference in Djambarrpuyu

Similarly to the Burarra pattern presented in (1) above, predication of the (actual) present and past in Djambarrpuyu (the actual domain) selects for either the I or III inflection (this pattern corresponding to Burarra’s CONTEMP and REMOTE respectively).

That is, I is used with both present reference (shown in 2a) and with past reference—to an eventuality that obtained in the recent (yesterday) past in (2b).

(2) The distribution of the I inflection in Djambarrpuyu

a. ŋarra ga nhä-ma mukulnha dhiyaŋ bala
   1s IPFV.I see-I aunt.ACC PROX.TEMP:ITV
   ‘I’m looking at aunty right now!’

b. ŋarra nhä-ma mukulnha barpuru
   1s see-I aunt.ACC yesterday
   ‘I saw my aunt yesterday’

III is also used in past-referring contexts: in (3a) to eventualities earlier on the day-of-speech (‘hodiernal past’), as well in descriptions of those that obtained in the distant past, this shown in (3b).

(3) The distribution of the III inflection in Djambarrpuyu

a. ŋarra nhä-pal mukulnha dhiyaŋ bili
   1s see-III aunt.ACC PROX.TEMP:CPLV
   ‘I saw my aunt just a moment ago’

b. ŋunhi ŋarra yothu yän, ŋarra nhä-pal mukulnha
   COMP 1s kid only 1s see-III aunt.ACC
   ‘I saw my aunty when I was a little kid’

Crucially, the occurrence of either III in hodiernal past and I in ‘yesterday past’ situations is categorical; speakers robustly judge utterances that switch the verbal inflection in (2b) and (3a) as ungrammatical. This pattern is further evinced in the sentences below, where, given a single utterance context and two descriptions of past events, the event described by I-marked verb is interpreted as prior to the III-marked one. This constitutes an argument against a characterisation of III as encoding anteriority/viewpoint aspect. In (4a), for example, there is no available interpretation (with or without frame adverbial dhiyaŋ bili ‘just before’) where the event described by the (III-marked) second clause precedes the event described in the first.
Conjoined descriptions of yesterday and hodiernal past events receive **I** and **III** marking respectively

a. [ŋjarra luk-a mänha barpuru ] ga [ŋjarra luk-ana mänha 1s drink-I water yesterday and 1s drink-III water (dhiyaju bili) ] (PROX.ERG:CPLV)

‘I drank water yesterday and I drank water just a moment ago/earlier today.’

b. barpuru munhagu ŋjarra luka djinydjalma’ ga roŋanmara-ŋjala yesterday night 1s eat.I crab and return.CAUS-III bapawa märr ŋyäi dhu luka dhiyaju bala godarrmirri father.DAT so 3s FUT eat.I PROX.TEMP:ITV morning

‘I ate some crab last night and this morning brought some back for Dad so that he can eat (some).’

Conversely, as Wilkinson points out, “the switch-over point [from **I** to **III** in prehodiernal settings] is not associated with an absolute time” (1991: 343ff). That is, while **III** is judged to be infelicitous in predications about the recent past, the distinction between **I** as against **III** in narrations about more remote events can be ultimately demonstrated to be vague (compare existing treatments of temporal remoteness marking and “graded” or metrical tense, in particular Bochnak & Klecha’s 2018 treatment of gradations in the past domain in Luganda).

Figure 2 summarises the picture of temporal reference that is presented here; cyclicity is represented as the discontinuity of licensing intervals for **I** and **III**.3 The description of this phenomenon as “cyclic” is owing to the intuition that the distribution of **I** and **III** arises from a correspondence between form and function; those reference intervals which license **III** precede those that license **I** relative to two possible context types: hodiernal (DAY-OF-SPEECH) and prehodiernal ones.

In Wilkinson’s description of Djambarpuyŋu (similarly to Eather’s (1990: 165) and Green’s work on the Maningrida languages—Nakara and Gurr-goni respectively—developing an approach adopted by Glasgow 1964), the licensing of tense morphology (and the establishment of temporal reference) is dependent on whether the run-

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3 Descriptions of (post-hodiernal) future eventualities receive **II** inflection, shown below. This is analysed as a morphologised mood/reality status distinction in Phillips (2021a,b).

ŋjarra dhu nhä-ŋju mukulnha godarr 1s FUT see-II aunt.ACC tomorrow

‘I’ll see my aunt tomorrow’
time of the described situation is understood to overlap with or obtain prior to the
day of utterance — this is shown in table 2.

The appeal to a contrast between hodiernal and prehodiernal “reference frames”
is in fact well motivated by typologies of graded tense systems, where, cross-
linguistically, the day-of-speech forms by far the most common basis for gram-
maticalising “objective measures” of temporal distance (Dahl 1983). This is a fact
that is recapitulated over disparate language families (Brugger 2001; Cable 2013;

Assuming, then, the availability of a linguistically relevant distinction between
an interval today’ and other intervals, we can motivate an intuition about the distrib-
utional properties of Djambarrpuyu tense morphology. Namely, that the contrast
between I and III originates in some distinguished status for the right edges of
temporal intervals (e.g. the reference frames today and before-today). This idea is
further developed in the next section.

4 The relabelling of Glasgow’s REMOTE tense as ‘PRECONTEMPORARY’ is due to Eather (1990: 166).

<table>
<thead>
<tr>
<th>↓ INF</th>
<th>• F_&lt;sub&gt;C&lt;/sub&gt; →</th>
<th>TODAY frame</th>
<th>FORE-TODAY frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTEMPORARY</td>
<td>dhiyay bala ‘presently’</td>
<td>barpuru ‘recently’</td>
<td></td>
</tr>
<tr>
<td>PRECONTEMPORARY</td>
<td>dhiyay bili ‘just before’</td>
<td>baman ‘long ago’</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 2** Cyclic tense: the temporal intervals (relative to \( t^* \), the time-of-speech)
licensing I and III are both discontinuous

**Table 2** The temporal interpretation of the verbal morphology—I and III—
depends on a contextually-provided “reference frame” \( F_C \) and examples of temporal adverbials with which they (optionally) co-occur.
Figure 3  \( \text{NFINST} \) holds between a property \( P \), some interval \( i \) and one of its final subintervals \( j \) iff \( P \) is INSTANTIATED at some other subinterval \( k \) that wholly precedes the final subinterval \( j \).

4 Precontemporaneity

In their 2015 account of the development of \textsc{perfect} semantics for the Indo-Aryan suffix -\textit{ta}, Condoravdi & Deo propose a relation—\textsc{nonfinal instantiation}—that holds between some property \( P \) and (pairs of) intervals \( i, j \) — a definition is given in (5).

\[
(5) \quad \text{Non-final instantiation} \quad \quad \text{(Condoravdi & Deo 2015: 279)}
\]

\[
\begin{align*}
\text{Defined iff } j & \sqsubseteq \text{FINAL} i; \\
\text{NFINST}(P, i, j) & \iff \exists k (\text{INST}(P, k) \land k \sqsubseteq i \land k \prec j)
\end{align*}
\]

In effect, a predicate is non-finally instantiated within some interval \( i \) iff it held \textit{within} \( i \), but \textit{prior} to \( j \)—some specified final subinterval of \( i \). This is schematised in Figure 3. For Condoravdi & Deo, this relation captures a fundamental property of \textsc{perfect} morphology as situating an event within an \textit{extended now} (\( \text{xnow} = i \)) but \textit{prior} to a specified reference time (\( j \)) within the \( \text{xnow} \) (2015: 283).

As in other languages, then the distribution of tense forms in Djambarrpuyu can then be understood as corresponding to a partition over times. Stipulating the availability of two possible reference frames (in 6), this partition is established by a \textsc{precontemporaneity} relation—in effect a special case of (5)—defined in (7).

\[
(6) \quad \text{Possible “reference frames” (F)}
\]

\[
F_c = \begin{cases} 
\{i | i \sqsubseteq \text{today}_c\} & \text{HODIERNAL} \\
\{i | i \prec \text{today}_c\} & \text{PREHODIERNAL}
\end{cases}
\]

\[
(7) \quad \text{Precontemporaneity}
\]

\[
\text{PRECONTEMP}_c(i) = \{i \sqsubseteq F_c | i \prec j_F\}
\]

An interval \( i \) is \textsc{precontemporary} with respect to a context \( c \) iff, given its reference frame \( F \), \( i \) wholly precedes a determined final subinterval \( j_F \)

\[5 \text{For current purposes, let } \text{today}' = \varepsilon(\text{DAY}(i*), i*): \text{ the interval from some moment which counts as the beginning of the day of utterance until the moment of utterance.}\]
Armed with this relation, we can provide lexical entries for I and III that capture their temporal contribution. Adopting a standard assumption that models tense morphemes as temporal pronouns—that is, (partial) identity functions over reference intervals (Partee 1973 a.o.)—(8) represents a proposal for the contributions of I and III.

(8) **Lexical entries for Djambarrpuyŋu inflectional categories I and III**

\[
[I]_c^c = \lambda i. i_c
\]
\[
[III]_c^c = \lambda i : \text{PRECONTEMP}(i_c). i_c
\]

In (8), III is taken to impose a requirement that the sentence’s reference time (at a fixed context) counts as *precontemporary* (i.e. is instantiated prior to a given final subinterval of the reference frame.)

In the HODIERNAL frame, given that any arbitrary final subinterval of F includes speech time \( i \), III is predicted to be incompatible with III.

Meanwhile, in the PREHODIERNAL frame \( F_{\text{PRE}} \)—an interval that is in principle unbounded on the left and extending up until the beginning of the day-of-speech \( (\infty, \text{today}'] \)—PRECONTEMP makes available subintervals that exclude this interval’s right boundary. Consequently, the duration of the final subintervals (corresponding to \( j \) in figure 3) is determined discretionarily; adjudicated by speaker intention, and specifically what can be considered to count as “contemporary” with respect to the discourse context 9. This gives rise to the apparent infelicity of III in descriptions of *yesterday past* eventualities (as in 2b, shown again in 9) — in effect, frame adverbials like *barpuru* locate events within final subintervals of \( F_{\text{PRE}} \).

(9) **Events situated beyond the ‘recent past’ are grammatical with I or III**

(from Wilkinson 1991: 343)

a. marŋi nhe ñarrakalaŋaw bapa’mirriŋuynjdja ñunhi ñayi dhingama-ny know you Is.ASS.DAT father-KINPROP REL 3s die-I

IFICATION bala dhungarray
ENDO.ERG ITV year.ERG

‘Did you know my father, who died last year?’

b. nhā nhokiyingal wāwa’mirriŋu warkthurr ñäthil rarrandharryu what 2s.ASS.DAT brother.KINPROP work.III previously summer.ERG

‘What did your brother do for work last summer?’

In this sense, given a discourse context, PRECONTEMP establishes a partition over the set of intervals \( \mathcal{I} \), modulated by the two possible values for F. This mechanism is represented by the diagram in figure 4.
Given an utterance time $t^*$, temporal intervals can be partitioned into a set of PRECONTEMPORARY intervals $\{i \mid i \in \varphi(k)\}$ and CONTEMPORARY ones $\{i \mid i \in \varphi(F \setminus k)\}$.

$k$ is a non-final subinterval of $F$ (either today or $(\infty, \text{today}']$).

According to (8), III presupposes that the $i_c$, a contextually-supplied reference interval (which will correspond to the instantiation of the predicate) is precontemporary with respect to the discourse context. In the case of (3a)—repeated below in (10)—given that the context has provided a reference interval that falls on the day of speech (today'/F_{hod}); it must wholly precede the time-of-speech in order to satisfy PRECONTEMP.

(10) Interpretation of III

a. ɲaŋ naŋal mulkunha ɣɚthu
    1s see III aunty.ACC today
    ‘I saw my aunt (earlier today).’

b. [10a]$^c$ is defined only if $i_c$ counts as PRECONTEMPORARY

\[
    \equiv \exists e[I.\text{SEE}].\text{AUNT}(e) \land \tau(e) \subseteq i_c
\]

Given this treatment of the contribution of III, which rules out its compatibility with present and recent/yesterday past reference, we can understand the complementary distribution of I as arising as a function of pragmatic blocking.

This account, then, relies on MAXIMIZE PRESUPPOSITION.\footnote{That is, $\langle [\text{III}] \rangle \subset [\text{I}]$ (in other words, $\langle \text{I}, \text{III} \rangle$ is a Horn scale.)} That is, given the more “specific” semantics of III relative to I,\footnote{The formulation of this principle due to Heim (1991). See also Sauerland 2002 (et seq), which argues for a trivial semantics for the English present tense on the basis of a scalar implicature obtaining between $\langle \text{PRS}, \text{PST} \rangle$.} the usage of I in a given discourse context $c$ implicates that $c$ cannot satisfy the conditions for felicitous use of III.
Consequently, usage of I gives rise to an implicature that the reference interval that has been provided by context does not satisfy PRECONTEMP and, within its reference frame, is situated within a final subinterval. As a consequence I is only felicitous with CONTEMPORARY reference.

5 Whence cyclic tense?

In his 1985 discussion of cyclic tense in Burarra, Comrie suggests that, given that this type of system “does not fit well within most current conceptions of tense, although its existence must be acknowledged; at best, one could appeal to its rarity as an excuse for according it marginal status within the overall theory” (88). Certainly, the analysis provided above runs the risk of drawing *ad hoc* stipulations about the identity of reference frames and final subintervals.

Conversely, a well-motivated semantic account of the distributional facts in these systems may provide valuable insight into the function, representation and emergence of tense morphology. One promising avenue comes from considering the system against the backdrop of a usage-based dichotomy such Benveniste’s notion of *plans d’énonciation* (“utterance planes”), which seeks to understand apparent interpretive differences between linguistic expressions (including tense forms) in *historique* and *discours* modes (1966: 238ff).

Our two reference frames: the HODIERNAL and PREHODIERNAL might be thought of as (loosely) corresponding to Benveniste’s dichotomy between the discursive and narrative planes respectively. For Benveniste, the different communicative intentions associated with discourse and historical narrative are at the root of contrasting strategies for establishing temporal relations, hence differing interpretive conventions for tense morphology between the two planes. He suggests that DISCOURSE is primarily interactional and directly indexes conversational participants, while NARRATIVE is characterised as an attempt to represent a chronological sequence of historical facts.

In this sense, the historical “plane” is likely to be associated with descriptions of situations that obtained before the here-and-now (e.g. the day of speech) and more interested in distinguishing degrees of remoteness from a deictic centre. Conversely, in everyday “discourse” a distinction between situations that hold at the moment of speech (the domain of the PRESENT) and those that are located in the immediate past (and where conversational participants were more likely to have been involved) is an obviously profitable semantic distinction to draw. This ul-

8 “Les temps d’un verbe français ne s’emploient pas comme les membres d’un système unique, ils se distribuent en *deux systèmes* distincts et complémentaires. Chacun d’eux ne comprend qu’une partie des temps du verbe; tous les deux sont en usage concurrent et demeurent disponibles pour chaque locuteur” (Benveniste 1966: 238).
Cyclic tense

timately boils down to a contrast in the likely relevance of the day-of-speech to
discursive as against narrative use of language and, consequently, the optimisation
of available morphological material in each “plane”.

This phenomenon is related to the historical/narrative present as it has been
described in numerous other languages—that is, the use of PRESENT tense mor-
phology (strongly associated with discourse) to achieve past temporal reference.
The distribution of these non-canonical uses of (present) tense and constraints on
reference establishment that appear to obtain have been the focus of recent work
in the formal semantic tradition (e.g. Anand & Toosarvandani 2018; Eckardt 2015;
Pancheva & Zubizarreta 2019; Schlenker 2004 a.o.)

A hypothesis that motivates cyclicity in Djambarrpuyuŋu, then is that uses of I in
(recent) past contexts can, in some sense, be understood as the categoricalisation of
a narrative present. Whereas I originated as a present tense form (and cognates of
I in closely-related varieties of Yolŋu Matha outside of western Arnhem do appear
to receive a conventional PRESENT interpretation), its use as a narrative present in
descriptions of recent (hence more local to the discourse context) events eventually
became obligatory. Consider, for example, (11) — an excerpt from a Djambarr-
puŋu narrative. III is used in the first sentence to refer to a speech event in the
remote past (wayana ‘spoke’). In the (directly) quoted speech that follows, III now
naturally refers to moments in the (recent/relevant) past as evaluated at (shifted)
topic time of the narrative.

(11) Quoted dialogue in a narrative context inducing reference frame shift

nhanju njandi mirriŋu-nydja waŋga-na-na : “Go, gama’kama-na nhuma dhu
3s.DAT mother.kinprop say-III-seq bring.I-seq 2p fut
girriny’tja mala, nhakuna munhdhurr-nydja ḳayi waku. Ga ɲunhi dhu
thing PL like gift.prom 3s daughter and endo fut
yolthu warrpam’ gurrupan ɲunhi nhaku ɲarra ɲanj’thu-rruna, ga
who.erg all give.I endo what.dat 1s ask-III and
ɲunjijyji dhu mārrama wakunha-nydja ḳarraku.”
endo.erg.ana fut get.I daughter.acc 1s.dat

‘...then her mother said: “Okay, bring stuff, gifts for my daughter. And
whoever brings everything that I asked for, that person gets my daughter.”’

[Matjarra (MG) [trans.] 1981]

Relevantly, Benveniste (1966: 242) argues:

Chaque fois, au sein d’un récit historique apparaît un discours, quand
l’historien par exemple reproduit les paroles d’un personnage ou
qu’il intervient lui-même pour juger les événements rapportés, on
passe à un autre système temporel, celui du discours. Le propre du langage est de permettre ces transferts instantanées.  

In a situation where, for example, quoted speech in narratives came to furnish a significant source of primary data for the acquisition of tense semantics, the tight association between hodiernality in conversational modes and prehodiernality in storytelling/narrative modes provides a possible locus for reanalysis of the contribution of verbal morphology in context. In this sense, the existence of cyclic tense systems can be thought of as a fascinating additional datapoint when considering the functional contribution and cognitive representation of tense as a displacement device and intensional category.

6 Conclusion

This paper has proposed a formal treatment of cyclic tense—tense morphology licensed by discontinuous temporal intervals—as it is realised in Djambarrpuyŋu. The analysis relies on a crisp distinction between a HODIERNAL and PREHODIERNAL FRAME, arguing that III—the PRECONTEMPORARY tense morpheme—is a marked form which restricts the reference time of a proposition to nonfinal subintervals of either of these two frames. As a result of pragmatic competition, the unmarked I is then restricted to the complement of III’s domain (relative to its reference frame)—viz the present as well as the recent pre-today past.

Finally, the HODIERNAL/PREHODIERNAL distinction—one that frequently seems to be morphologised cross-linguistically—was associated with the distinction between conversational and narrative modes (Benveniste’s plans d’énonciation). This constitutes a proposal for the diachronic emergence of a cyclic system; as a possible consequence of the semanticisation of divergent usage conditions that are associated with the same tense morphology between these two “planes”.

References


9 ‘Whenever—in the midst of a narrative—the narrator reproduces the speech of a character or themselves intervenes to make observations on the reported events, we’ve jumped to another temporal system: discourse. It is a property of language to allow for these instantaneous jumps.’ (My translation)
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