Negation, Irreality & the Djambarrpuyŋu Inflectional Paradigm

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1. Introduction

This paper presents an analysis of the mood ("reality-status") marking system of Djambarrpuyŋu (Yolŋu Matha: Pama-Nyungan), in particular as it relates to "asymmetric negation" — a phenomenon wherein a reality status distinction available in affirmative sentences is neutralised in negative ones (Miestamo 2005). An effect of this asymmetry is shown for Djambarrpuyŋu in (1-2). Crucially, the distinction encoded by the inflectional suffixes glossed here as **I** and **II** is unavailable in the presence of a negative operator (*bäyŋu* 'NEG'). **I**-inflection is ungrammatical in (1b).

(1) **I** ESTABLISHES *present*-REFERENCE; UNAVAILABLE IN (PRESENT-REFERRING) NEGATIVE SENTENCES

    a. ŋarra ga   nhä-**ma** mukulnha   b. bäyŋu ŋarra gi   nhä-**ŋu** mukulnha
       1s   IPFV.**I** see-**I**   aunt-ACC   NEG   1s   IPFV.**II** see-**II** aunt.ACC
       'I see my aunt (right now).'   'I don't see my aunt (right now).'

(2) **II** IS AVAILABLE IN FUTURE-REFERRING SENTENCES INDEPENDENT OF POLARITY

    a. goḏarr   ŋarra dhu nhä-**ŋu** mukulnha   b. bäyŋu ŋarra dhu nhä-**ŋu** mukulnha
       tomorrow 1s   FUT see-**II** aunt.ACC   NEG   1s   FUT see-**II** aunt.ACC
       'I'll see my aunt tomorrow.'   'I won't see my aunt tomorrow.'

On the basis of new data elicited in the field (Arnhem Land, northern Australia), this comprises the first formal treatment of the semantics of reality status in an Australian language, joining recent work on verbal mood in languages outside of Europe (*e.g.*, Matthewson 2010 on Sƚáƚimcets, Krifka 2016, von Prince 2017 on Daakie and Daakaka respectively).

To this end, Djambarrpuyŋu verbal inflection is modelled as encoding a binary reality status distinction, where IRREALIS MOOD is taken to comprise a presupposition that the conversational background is *diverse* (in the sense of Condoravdi 2002) with respect to the inflection's prejacent. This treatment aligns with theories that highlight the markedness of negative sentences vis-à-vis affirmative ones and, consequently, predicts patterns involving the neutralisation of reality status marking in negative contexts, as it is exhibited in Djambarrpuyŋu.

2. Language background: Yolŋu Matha
2.1. Linguistic ecology

Djambarrpuyŋu is a variety (clan-lect) of Yolŋu Matha, a small language family spoken in northeastern Arnhem Land (Northern Territory) and a subgroup of the ranging Pama-Nyungan. The Yolŋu homeland

(*Yolŋuw wäŋa*) is a linguistic exclave; in effect surrounded by the territories of a number of unrelated, non-Pama-Nyungan speech communities (Gunwinyguan, Maningrida *etc.*)

Yolŋu varieties constitute a complex dialect chain; most are variably mutually intelligible with one another (Heath 1981, Morphy 1983) with the exception of a number of languages at the extreme west of the Yolŋu homeland (*i.e.*, Djinaŋ & Djinba, see Schebeck 2001, Waters 1989). This stable language contact situation is perpetuated by obligatory clan exogamy; an effect of which is household multilingualism; children are raised conversant in at least two languages.

2.2. Inflectional paradigms

Yolŋu languages have verbal paradigms which are at least partially cognate and likely reconstructable to a proto-system (Schebeck 2001, see comparative reconstruction pilot 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 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 view of exemplifying a "well-behaved" verbal paradigm in a Yolŋu Matha variety, the distribution of these forms in Ritharrŋu/Wägilak (southeastern Arnhem) is shown in (3) below. According to Heath (1980), Ritharrŋu/Wägilak distinguishes four categories across six basic conjugation classes. The primary function of these, clearly demonstrated in (a-c), is to encode temporal information. Further, the inflection in (3d), Heath's PAST POTENTIAL, is used for counterfactual claims. In contrast to the Djambarrpuyŋu pattern shown in (1), each of the Wägilak inflections is compatible, and composes, with the clausal negator -*'may'* 'NEG'.

(3) THE BASIC DISTRIBUTION OF INFLECTIONAL CATEGORIES IN WÄGILAK

    a. nhä-**ma** rra (yakuthi) mukulnha
       see-PRS 1s (now) aunt.ACC
       'I'm looking at my aunt currently.'

    b. (goḏarrpuy) ŋarra nhä-**ŋu** mukulnha
       (tomorrow) 1s see-FUT aunt.ACC
       'I'll see my aunt tomorrow.'

    c. (ripurru-mirri) ŋarra nhä-**wala** mukulnha
       (yesterday) 1s see-PST aunt.ACC
       'I saw my aunt yesterday.'

    d. ŋarra nhä-**wa** mukulnha
       1s see-PPOT aunt.ACC
       'I should've seen my aunt.'

3. Verbal mood in Djambarrpuyŋu

3.1. The Djambarrpuyŋu verbal paradigm

Previous descriptive work on a number of Yolŋu varieties spoken in the western regions of the Yolŋu homeland (including Djambarrpuyŋu) has tended to eschew glosses/metalinguistic labels for verbal inflections. The decision, for example, to enumerate Djambarrpuyŋu's four inflectional categories (FIRST, SECOND... or PRIMARY, SECONDARY...) is driven by complexities in each inflections' distribution. Phenomena — including the *negative asymmetry* addressed here — complicate prospects of a unified analysis of the semantic contribution of each inflection. As suggested in § 1, following these conventions, I gloss these categories as **I**, **II**, **III** and **IV**.

Wilkinson (2012 [1996]: 345) appropriately suggests that **I** and **III** are generally aligned with a notional REALIS whereas **II** and **IV** represent their IRREALIS counterparts. Phillips (2021: part III) proposes an analysis of the Djambarrpuyŋu paradigm in terms of two (privative) semantic oppositions: *precontemporaneity*[1] and *nonveridicality*. On this analysis, **II** and **IV** — the IRREALIS categories — carry a *non-*

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[1] Effectively a tense category, *precontemporaneity* is taken to underpin the phenomenon of "cyclic" temporal reference (e.g., Comrie 1985: 81). While the effects of cyclicity are shown here, this semantic property is not further discussed. See Phillips (2021: ch. 8) for more.

veridicality presupposition, as opposed to **I** and **III**. The semantics of the four inflections, then can be schematised as in the table in (4)

(4) The contributions of the four inflectional categories (Phillips 2021: 257)

		MOOD	
		−IRR	+IRR
TENSE	−PRECONTMP	I	II
	+PRECONTMP	III	IV

3.2. *Nonveridicality & the functional domain of* **II** *and* **IV**

Notions of "nonveridicality" have been effectively deployed in analyses of the subjunctive mood in European languages (particularly as manifested in Romance and Balkan languages). For Giannakidou (2016 a.m.o.), the (non)veridicality of a modal base with respect to a given proposition is the primary regulator of mood selection in Greek. On her account, the subjunctive indicates the nonveridicality of some contextually-retrieved modal base with respect to the uttered proposition, whereas indicatives are taken to "indicate a veridical epistemic state" (190–1).

(5) A definition of nonveridicality (see Giannakidou 2016: 190)
    M is **nonveridical** w/r/t *p* iff $\exists w'[w' \in M \wedge w' \in \neg p]$
    A modal base *M* is nonveridical with respect to *p* iff there is some world (w') in *M* at which *p* doesn't hold.

Unlike the subjunctives of many European languages, however, Djambarrpuyŋu's irrealis-aligned inflections occur in matrix clauses. That is, they are not governed by a embedding predicate and modal flavour of a given IRR-inflected predicate is not determined by a higher clause. **II** and **IV**, do, however, always co-occur with some member of a closed class of "modal particles" (MP), most importantly *dhu* 'FUT' (see 2) and *balaŋ* 'MOD'.[2] Examples of this co-occurrence are given in (6) below.

(6) a. ŋayi bala **balaŋu** bukthu-**rru**
        3s   MVTAWY MOD   break-**II**
        'It (the recorder) might break.'

    b. nhe **balaŋu** malkthu-**nha**
        2s   MOD   accompany-**IV**
        'You should/would have gone with (him).'

It is in this respect that Palmer (2001: 185) suggests a possible notional distinction between IRREALIS- and SUBJUNCTIVE-type mood distinctions: that is, they are licensed by a clausemate modal or a subordinating predicate respectively.

I take the MPs *dhu* and *balaŋ* to realise modal operators; following Condoravdi (2002), these take a predicate *P* in their scope, retrieve a restriction from context (*i.e.*, a (circumstantial) modal base and ordering source), and assert that *P* obtains in the future of the modal's evaluation time. The evaluation time itself is constrained by the inflection: in Condoravdi's terms, **IV** associated with past perspective and **II** with non-past perspective.

3.2.1. *Modelling assumptions*

In order to model the semantic contribution of Djambarrpuyŋu's verbal inflections — including the IRREALIS mood as realising a presupposition of nonveridicality — I adopt a "branching time model" (compare Krifka 2016, von Prince 2019). Formally a set ($\mathscr{I}$) of semantical indices, which is partially ordered by a (temporal) *precedence relation* $\prec$, yielding a "tree' structure $\mathfrak{T}$. *Branches* of the "tree" (that is chains of indices or totally ordered subsets of $\mathfrak{T}$) represent complete histories/possible developments of the world.

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[2] **II** with a null-subject is frequently also used to form imperatives. Imperatives will be taken to contain a covert deontic model for the purposes of the current proposal.

The branching model captures the intuition that, at a given point in time ($i*$), the nature of the past is settled while facts about the future are necessarily contingent. This intuition underpins the notion of *metaphysical possibility*, and in this sense, $\mathfrak{T}$, represents a metaphysical modal base, relative to some root index $i\circ$ (viz. $\cap\approx_{i_\circ}$). On this basis, $\prec$ can induce a partition on $\mathcal{I}$ corresponding to a "modal trichotomy" (see Rumberg (2016), von Prince (2017, 2019) and von Prince et al. (forthcoming) a.o.). An example of a branching time frame in terms of a $\prec$-induced modal trichotomy (relative to a fixed index $i*$) is illustrated in (7).

(7) BRANCHING TIMES MODELS ASSUME A SETTLED PAST AND AN UNSETTLED FUTURE FOR ANY GIVEN INDEX (e.g., $i*$)

ACTUAL (past/present) = $\{i \mid i \leqslant i*\}$

POTENTIAL = $\{i \mid i \succ i*\}$

COUNTERFACTUAL = $\{i \mid i \text{ is unordered by } \prec \text{ w/r/t } i*\}$

3.2.2. The irrealis presupposition

Djambarrpuyŋu verbal inflections will be uniformly taken to denote (partial) identity functions. That is, they impose a presupposition on a contextually-supplied "index pronoun" (following referential treatments of tense morphology.) As suggested, **II** and **IV** both involve an IRREALIS presupposition — effectively, they require that their prejacent *not be a metaphysical necessity* at the evaluation index i (or, more precisely, at the earliest point in a contextually-supplied interval — $\mathbf{e}(i)$). The satisfaction conditions for IRR are given in (8).

(8) A RELATION BETWEEN AN EVALUATION INDEX AND A PREDICATE: THE CONTRIBUTION OF IRREALIS MOOD AS NONVERIDICALITY
IRR $= \exists b \in \cap\approx_{\mathbf{e}(i)} \wedge \exists^b i'[i \leqslant i' \wedge \neg P(i')]$
IRR, a relation between an evaluation index i and a predicate P, is satisfied if there exists some i' along one of i's metaphysical alternatives (as calculated at the left boundary of i) at which P doesn't hold.
That is, IRR is satisfied iff P is not metaphysically necessary at i.

Djambarrpuyŋu's modal particles — including *dhu* and *balaŋ*, described above — make a claim about a proper subset of $\cap\approx_i$ (*sc.* the "best" metaphysical alternatives, according to some contextually-specified ordering). Both of these MPs, therefore, are compatible with (and indeed implicate) that there is some possible world (set of indices) along which their prejacent doesn't hold. In this sense, the modal particles can be described as NONVERIDICAL operators.)

4. The negative asymmetry

Indicated in (1), and further shown in (9-10) below, verbal predicates in sentences containing the standard negative element *bäyŋu* receive **II** and **IV marking**. Consequently, **I** and **III** are (generally) ungrammatical in negative sentences.

(9) a. ŋarra **nhäŋal** mukulnha gäthur
    1s   see.**III** aunt-ACC today
    'I didn't see my aunt this morning.'

b. bäyŋu ŋarra **nhänha** mukulnha gäthur
    NEG 1s   see.**IV** aunt.ACC today
    'I didn't see my aunt this morning.'

(10) a. ŋarra **nhäma** mukulnha barpuru
          1s   see.**I** aunt-ACC yesterday
          'I didn't see my aunt yesterday.'

      b. bäyŋu ŋarra **nhäŋu** mukulnha barpuru
          NEG   1s   see.**II** aunt.ACC yesterday
          'I didn't see my aunt yesterday.'

4.1. A functional explanation

Miestamo develops a broad cross-linguistic typology of sentential negation, focussing in particular on the manifestation, distribution and classification of "asymmetric" negation — a class of phenomena where negative sentences have a non-trivially different morphosyntactic structure than positive ones — that is, the shape of a negative sentence diverges from its affirmative counterpart beyond the presence/absence of an overt negative element.

The "NONREALIZED" subtype of asymmetry groups languages which have 'grammaticalized the fact that negation belongs to the realm of the non-realized' — that is, negative and modal operators can be shown to interact formally in a number of ways (Miestamo 2005: 208).

As we have seen above, the primary role of nonveridical operators and irrealis marking can be understood as involving allowing for the possibility that a given situation is not instantiated in the "actual world." Relatedly, the basic contribution of negative operators is the denial the truth of a given proposition, that is, they commit the speaker to the NONREALISED status of some predicate. For this reason, sentential negtion has been described as an ANTIVERIDICAL operation — roughly, φ and $\neg\varphi$ denote disjoint situations.

Consequently, for languages exhibiting this asymmetry, irrealis and negative operators can be thought of as performing conceptually-related functions — *viz.* indicating that a given proposition is *not* being asserted, that the speaker is *not* committing to a fact in the actual world: "the association between negation and non-reality on the formal level iconically reflects the association between negation and non-reality on the functional level" (Miestamo 2005: 208).

4.2. A "nonveridical" class

Phillips (2021: 247) proposes a lexical entry for *bäyŋu* 'NEG' as a negative quantifier over metaphysical alternatives to the evaluation index ($\cap\approx_i$). That is, the contribution of a negative operator (as realised in Djambarrpuyŋu by *bäyŋu* 'NEG' or *yaka* 'NEG' in their standard uses)[3] is to claim that in *no totally realistic metaphysical alternatives* In effect, it is shown that this constitutes a treatment out of which a natural class of "nonveridical operators" (comprising both truth-functional negative particles and modal particles) falls: all are predicate modifiers ($\mathfrak{D}_{\langle s,t\rangle}^{\mathfrak{D}_{\langle s,t\rangle}}$) which introduce a quantifier over metaphysical alternatives to an evaluation index.

4.3. Negation satisfies the irrealis presupposition

Djambarrpuyŋu inflections, as described above, impose presuppositions on the identity of a contextually-provided evaluation index. The mood component (IRREALIS) that is encoded by **II** and **IV** is modelled as the presupposition that there is some metaphysical alternative — as calculated at $\mathfrak{e}(i)$ — at which the inflection's prejacent does not hold.

In negative sentences, the inflection takes a negated proposition in its scope. Consequently, the co-occurrence of the IRREALIS inflections with these negative propositions will be taken to *presuppose their corresponding affirmation*. The denotation — *sc.* presuppositional and truth-conditional meaning components — of the sentence in (1b) is given in (11) below (abstracting away from the temporal contribution of **II**), including a branching time schema, illustrating the relations between relevant indices.[4]

(11) a. bäyŋu ŋarra gi   nhä-**ŋu** mukulnha (dhiyaŋ bala)
          NEG   1s   IPFV.**II** see-**II** aunt.ACC (now)
          'I don't see my aunt (right now).'

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[3] There is some evidence, discussed in Phillips 2021, that these particles can admit of different types of conversational backgrounds (that is, function as impossibility modals.)

[4] Particular thanks to Ashwini Deo for fruitful conversation on this topic.

b. **Presupposes:** $\exists b \in \cap\approx_{e(\text{xnow})} \wedge \exists^b i'[e(\text{xnow}) \preccurlyeq i' \wedge \neg\nexists e[\text{I.SEE.AUNTY}(e) \wedge \tau(e) \sqsupset i']$
   Asserts. $\nexists e[\text{I.SEE.AUNTY}(e) \wedge \tau(e) \sqsupset \text{xnow}]$

c. <u>In words</u>, an utterance of *bäyŋu ŋarra gi nhäŋu mukulnha dhiyaŋ bala* 'I don't see my aunt right now' at some context *c*:

    · **presupposes** that there is some branching metaphysical alternative — as evaluated at the beginning of the some interval extending back from the speech time *i∗* (the "extended now" xnow, e.g., McCoard 1976, Stump 1985 a.o.) — along which there is a (relevant) index i', a successor to the left-boundary of xnow, at which there it's not the case that there is no event whose runtime includes i'. That is, there is a metaphysical alternative to $e(\text{xnow})$ along which the speaker is seeing their aunty at i'.

    · and **asserts** that there is no event of the speaker seeing their aunty that contains xnow.

d. A BRANCHING TIMES SCHEMA OF THE SEMANTICS OF (a = 1b)
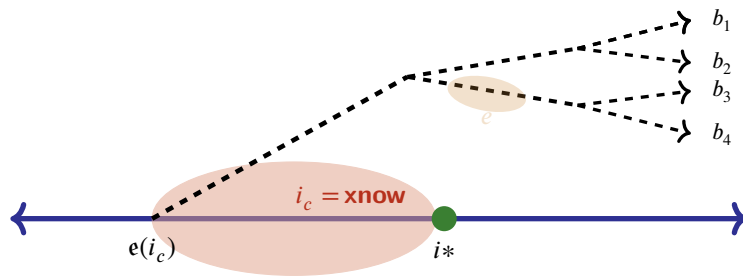
The notion of some markedness to negative claims/an asymmetry between affirmative and negative sentences is accompanied by centuries of philosophical debate (for a detailed synopsis, see Horn 2001, especially § 1.2). For those who maintain a perspective of negation as some species of 'second-order affirmation' (Horn's "asymmetricalists"), much of the discussion has related to how it is that a negative sentence (pre)supposes an affirmative, but not vice versa (Horn 2001: 64).

The asymmetry, then, is often taken to boil down to an intuition (see Givón 1978 *et seq*) that an utterance of ¬φ generally seems to reflect a belief on the part of the speaker that their interlocutor is familiar with and may be entertaining the possibility that φ. This, in effect, is what is modelled as the presuppositional content of the IRR inflections (which, as shown, are obligatory in (most) negative contexts.) That is, in selecting inflecting a verbal predicate with the irrealis mood, a speaker seems to rely on the idea that it is *in the common ground that the prejacent of a negative operator (that is, some affirmation/positive claim about the world) was a (reasonable) metaphysical possibility*.

In this sense, Miestamo's NONREALIZED asymmetry between mood-marking in positive and negative clauses, is explained in terms of the insights of Horn's asymmetrists' claim that 'a negative utterance presupposes the corresponding affirmation.'

5. Finetuning nonveridicality: two more observations

5.1. The hodiernal future

At a number of points in the previous section, I hedged the claim that '**I** (and **III**) are incompatible with negation.' Predications about the *same-day future*, whether or not they are negated, categorically receive **I**-inflection — an example is given as (12). This can be analysed in terms insights from the literature on the semantics of futurate constructions and how these relate to the "presumption of settledness" (*e.g.*, Condoravdi 2002, Copley 2009, Kaufmann 2005).

(12) ŋarra (**yaka**) **dhu** nhä-**ma** mukulnha yalala
    1s   NEG   FUT see-**I**   aunt.ACC later
    'I'm (not) seeing aunty this evening.'

The basic idea here, is that assertions about the future of the day of utterance can be taken to denote plans (in the sense of Copley 2009). Following the discussion in § 3.2, *dhu* requires an evaluation index (in

this case c provides $i*$) and obligatorily advances the instantiation time of the eventuality into the future of $i*$. The unexpected occurrence of **I** implies the "presumed settledness" of its prejacent in context (more precisely, the use of **I** in these contexts *antipresupposes* the diversity of metaphysical alternatives to $i*$ with respect to predications about indices that closely follow $i*$).

Given that the instantiation and non-instantiation of a given event are, in principle, equally plannable; both positive and negative claims about the same-day future are treated as equally metaphysically "actual" and therefore equally assertable.

5.2. Assertoric force

As stated above, an effective criterion on which realis/irrealis- and indicative/subjunctive-type mood systems have been distinguished is the fact that irrealis marking is often licensed by a modal element in the same clause as a given predicate, whereas subjunctive marking are generally licensed only in embedded clauses governed by specific predicates.

The Djambarrpuyŋu irrealis is *not* licensed by non-factive (incl. antifactive) predicates (those which are compatible with or even entail the falsity of the proposition that they embed) — the traditional domain of subjunctive governors. This is accounted for by assuming that matrix clauses are headed by an ASSERT which is responsible for identifying the evaluation index with the utterance parameters. In subordinate clauses, these parameters can be shifted "away from the speaker's commitment slate" (Krifka 2021).

Additionally, *mak* 'maybe, perhaps'—an apparent epistemic operator—also fails to trigger irrealis marking. Similarly, in the style of Krifka (2021) (and many accounts of the relative height of epistemic, relative to root modals, in the clause (*e.g.*, Hacquard 2010), *mak* can be analysed as a (variable-force) judgment modifier in the clause's left periphery (that is, it merges above the inflection, to which it is invisible.) This behaviour is predicted by the proposal for the IRREALIS presupposition above, which is interested in the diversity of a *metaphysical* conversational background.

A generalisation over the domain of Djambarrpuyŋu's irrealis mood can be precised then presupposing the *metaphysical* (objective) non-settledness of a given property at a contextually-supplied index.

6. Conclusion

In this paper, we have seen how the surprising neutralisation of a reality status distinction in Djambarrpuyŋu negative clauses can be understood by developing a formal account of the inflectional paradigm as encoding verbal mood. Modal and negative operators have previously both been heuristically unified in terms of their signaling the "non-assertion" of a proposition contained within some utterance. If we model Djambarrpuyŋu's IRREALIS MOOD as a partial function, encoding a presupposition that its prejacent is *unsettled* at a given time (that is, its truth is objectively non-knowable), then the distribution of the relevant inflectional categories (*sc.* **II** and **IV**) is predicted.

This account also provides a way of uniting observations made in the typological literature (cross-linguistic variation with respect to the question of whether negation is an *irrealis* category) with theoretical claims about the "markedness" of negative claims relative to their affirmative counterparts; the former have previously been claimed to "suppose" the latter in some sense. The analysis defended here also comprises a model-theoretic treatment of this intuition, where, IRREALIS signals that the negation of a given proposition (including an already-negative one) is/was an active possibility at the beginning of some reference interval.

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