DOCTORAL DISSERTATION

At the intersection of temporal & modal interpretation:
a view from Arnhem Land (northern Australia)
[working title]

A Dissertation
to be Presented to the Faculty of the Graduate School
of
Yale University
in Candidacy for the Degree of
Doctor of Philosophy

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draft for October 26, 2020

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Chapter 0

Introduction

DISPLACEMENT has been proposed as universal and distinctive property of human language which permits us to make assertions that are embedded in different times, locations and possible worlds (*e.g.* Hockett's 'design features of human language' 1960:90). Linguistic work — descriptive, pedagogical, theoretical — has traditionally assumed a categorical distinction between subtypes of verbal inflection: *viz.* the TEMPORAL and MODAL domains. Whether or not these basic claims are intended as heuristic, they quickly unravel upon close inquiry into cross-linguistic data; a challenge for linguistic theory, and one that a growing body of literature is identifying (e.g. Condoravdi 2002, Laca 2012, Rullmann and Matthewson 2018 among many others).

The body of this dissertation consists of a number of more or less related studies that consider the roles of conventionalised linguistic expressions and context (*sc.* the interplay of semantics and pragmatics) in "displacing" discourse – that is, how, in a given discourse context, reference is established to different possible worlds and different times. The role of this introduction is to introduce (and motivate) the major assumptions and theoretical commitments that underpin these essays and to highlight how, they connect with one another and (hopefully) constitute data and analyses that have the potential to further refine and nuance theories of natural language semantics, specifically in terms of what these have to say about the mechanics of displacement.

The essays variously consider data from English and from a number of languages spoken in Aboriginal Australia, on the basis of both published and original data, collected in consultation with native speakers.

In **Chapter 1**, we propose an analysis of the meaning and interpretation constraints on the English lexical item *otherwise*. Drawing on a proposal by Webber et al. (2001), we treat *otherwise* as a "discourse anaphor", that is, an adverbial that signals 'discourse relations between adjacent discourse units' (Webber et al. 2001:1). In order to model its contribution, we argue that the antecedent is accommodated from the pronounced utterance preceding *otherwise* and can be furnished by any of the propositions (*sc.* sets of worlds) that serve to restrict the context set of this utterance, crucially deploying the "modal subordination" framework due to Roberts (1989 *et seq.*) in order to account for this. We appeal to information structural notions, and in particular to the notion of a current "Question under Discussion", in determining the nature of the antecedent. Consequently, the chapter constitutes a **dynamic analysis of a discourse anaphor** (*sc.*, one that considers the development of discourse participants' information states over time) that additionally accounts for its flexible distribution and previously unobserved limitations on its use.

Chapter 2 provides a first formal semantic account of "**apprehensionality**", paying particular attention to an apparent meaning change trajectory, where future-oriented temporal expressions develop modal readings. In order to get at this, the Chapter describes and accounts for the changes in the distribution of the Australian Kriol adverb *bambai*. An observation originally due to Angelo and Schultze-Berndt (2016, 2018), *bambai* started its life as a temporal frame adverbial ('soon, shortly thereafter') and has developed so-called "apprehensional" uses. In many contexts *bambai* is translatable as 'otherwise' – on account of its reliance on accommodation processes, the account defended here treats *bambai*-type apprehensives as discourse anaphors that involve the modal subordination of their prejacent to elements of foregoing discourse (*cf.* ch. **1**). The chapter provides a detailed explanation of the range of uses available to *bambai* in both its temporal and modal functions. On the basis of this, I propose a lexical entry that unifies these uses, in so doing, offering an account of the emergence of explicitly modal readings in a future-oriented ("subsequential") temporal adverb, as well as a semantics for apprehensional marking.

Chapter 3 comprises a first semantic treatment of **the Negative Existential Cycle**, also demonstrating its instantiation in a number of subgroups of Pama-Nyungan on the basis of comparative data from Thura-Yura, Yolŋu Matha and Arandic. The Negative Existential Cycle (see Croft 1991, Veselinova 2016) is a proposed grammaticalisation process where negative existential predicates develop into markers of sentential negation. Here I propose a treatment where the PRIVATIVE—a grammatical category described in many Australian languages (e.g. Dixon 2002)—is taken to realise the semantics of a negative existential. Diachronically, I provide evidence that erstwhile privatives generalise into sentential negators: an instantiation of the NEC, giving a unified semantics for nominal and verbal negation. I take this cycle to provide support for a treatment of **negation as a two-place (modal) operator** and additionally suggest that this cycle can be united with general observations made in the grammaticalisation literatures regarding the functional pressures underpinning meaning change.

Chapter 4 comprises a description and analysis of the intricacies of temporal and modal expression in Western Dhuwal(a) — a Yolŋu Matha language spoken in northern Arnhem Land. Of particular note is the phenomenon of **cyclic tense**: a species of *metricality*/temporal distance marking where a given inflectional category appears to encode the instantiation of a given property at discontinuous intervals. Additionally, I give an semantic account of **negation-based asymmetries in reality-status marking** (cf. Miestamo 2005), a phenomenon where mood distinctions are collapsed in negative predications. This account converges with observations made in Chapter 3, *viz.* possible treatments of sentential negators as modal expressions. These two phenomena (to varying degrees) represent areal features of central Arnhem Land languages.

0.1 Literature Review: Formal theories of displacement

Chapter 1

Discourse anaphora and dynamic interpretation: the case of *otherwise*

The work presented here develops an analysis of English *otherwise*, drawing on tools from the dynamic semantics and information structural literatures.[1] A simple example is given in (1):

(1) *A simple* 'otherwise' *sentence and a paraphrase of its meaning*:

a. Mary wears a yellow vest when she cycles.
Otherwise, drivers might not see her on the road.

b. ≈ If Mary does not wear a yellow vest, drivers might not see her.

As (1) illustrates, *otherwise* can be paraphrased as a conditional: its antecedent is the *negation* of the sentence preceding it, and its consequent is the sentence following it. A first approximation of this intuition can be spelled out as in (2):

(2) *A first attempt at the meaning of* otherwise*:* (to be revised)

$$[\![\textit{otherwise}]\!] = \lambda p_{\langle s,t\rangle} \lambda q_{\langle s,t\rangle} \lambda w_s . \neg p(w) \rightarrow q(w)$$

Given two propositions p, q and some world w, *otherwise* states that, if p doesn't hold in w, then q holds in w.

In this paper, we focus on *otherwise*'s use as a discourse 'connective' or 'anaphor' (e.g. Kruijff-Korbayová and Webber 2001, Webber et al. 2001), so named because of its apparent interpretive reliance on foregoing elements of discourse.[2] This is demonstrated by the sentence pair (3), from Webber et al. (2001:7). Each sentence is accompanied by a paraphrase that spells out its intended meaning.

[1] This chapter represents a (very lightly modified) version of a manuscript emerging out of joint work with Dr Hadas Kotek. As of October 26, 2020, that manuscript is under review for *Journal of Semantics* (ID `JS-19-09-088.R1`).

[2] For the purposes of this current paper, we restrict our attention to these "inter-clausal" adverbial uses. As we will discuss in §1.6, however, we anticipate that our account could be expanded to account for other uses as well.

(3) *"Red Light sentences" with the discourse anaphor* 'otherwise':[3]

a. If the light is red, stop. *Otherwise* go straight on.
≈ If the light is not red…

b. If the light is red, stop. *Otherwise* you'll get a ticket.
≈ If the light is red and you don't stop…

As example 3 makes clear, the question of how to determine the antecedent to *otherwise* is quite subtle. While the pronounced utterance preceding *otherwise* is identical in both 3a and 3b, it is clear that the proposition that is interpreted as the antecedent of *otherwise* in each case is different. How, then, is this antecedent determined? It is clear that some pragmatic means must be in play.

In a nutshell, we develop an analysis of *otherwise* which draws on existing dynamic semantic analyses of conditionals. We'll argue that *otherwise* contributes a discourse move whose content is to predicate a subsequent proposition of the *complement* of some set of worlds computed based on the clause preceding *otherwise*. This will allow us to predict the set of possible antecedents to *otherwise* in a given sentence, how a particular antecedent is chosen out of this set, and how it is constrained.

At this point, it is important to be clear about the terminology and assumptions that we will adopt in this paper. As example 3 demonstrates, the *antecedent utterance* preceding *otherwise* need not be identical to the *antecedent proposition* used in the interpretation of *otherwise*, although, as we will show, the former informs and constrains the latter. In fact, the antecedent utterance need not be a proposition at all: it can be a conditional or a question, as well:

(5) Otherwise*'s antecedent utterance may be a declarative, imperative, or (certain) interrogatives:*

a. Jake's asleep, *otherwise* he would have come.

b. Stop. *Otherwise* you'll get a ticket.

c. Do you have your car? *Otherwise* I'll give you a lift.

d. Do you want to get a beer at Three Sheets or Counterweight tonight? *Otherwise* you make a bloody suggestion.

[4]

A (declarative) *otherwise* statement, then, includes three components: (a) An *antecedent utterance* is put on the table as accurate to the best of the speaker's knowledge.[5] (b) An *antecedent proposition* is accommodated, representing the complement of a set of worlds

[3] In section 1.3.2.2, we identify a *third*, previously unnoticed reading of this sentence:

(4) If the light is red, stop. *Otherwise* there'll be chaos on the roads.
≈ If the rules of traffic aren't obeyed…

At this point in the paper, however, our points can be made by concentrating on the two cited variants in 3 which have been recognized in previous literature.

[4] To our ears, (d) can be read with either polar question or alternative question intonation. In both cases, a proposition of the form 'you don't want to get a beer at either place' seems to be accommodated.

[5] That is, *asserted*, cf. Stalnaker 1979.

introduced by this antecedent utterance.[6] (c) The *consequent* of *otherwise* provides a description of what happens in such worlds.[7] We spell this out below for examples 3a and 3b:

(6) *Components of the* otherwise *sentence in 3a:*

a. Antecedent utterance: *If the light is red, stop.*

b. Antecedent proposition: *The light is not red.*

c. Consequent: *(You) go straight on.*

(7) *Components of the* otherwise *sentence in 3b:*

a. Antecedent utterance: *If the light is red, stop.*

b. Antecedent proposition: *The light is red and you don't stop.*

c. Consequent: *You get a ticket.*

The *antecedent propositions* in 6b and 7b are different, but we see that they are both derived from the same *antecedent utterance*, 6a = 7a. More specifically, we will argue in section 1.3 that the set of candidate propositions that can be accommodated from the antecedent utterance is any of the propositions that serve to restrict the context set of this utterance. We will compute this set appealing to Roberts' modal subordination framework. We will show how this proposal makes correct predictions about the distribution of possible antecedents to *otherwise* in cases such as 3 and, in addition, that it correctly predicts a previously unnoted interaction of *otherwise* with possibility modals as well as other restrictions on the choice of antecedent.

In order to identify the antecedent proposition that *otherwise* actually operates on in a given sentence, we take a view that emphasizes the *flow of information* in a discourse (see also Roberts 2012), and make reference to the Question under Discussion (QuD) and the current Information Structure.

In what follows, we first discuss in a bit more detail the previous analyses and additional properties of *otherwise*, which our analysis builds on (sections 1.1-1.2). We then develop our analysis of the semantics and pragmatics of *otherwise* in section 1.3. In section 1.4, we present several novel observations about *otherwise* that follow from our analysis. We conclude the paper by briefly discussing connections between our proposal and the phenomena of donkey anaphora and complement anaphora, in addition to an expansion of our proposal to nonclausal uses of *otherwise* (section 1.5). Two such examples are given in (8):

(8) *Intra-sentential uses of* otherwise*:*

[6] We focus predominantly on declarative antecedents in this paper, but we believe that future work should lead to interesting discoveries about the shape of possible non-declarative antecedents and the accommodation step we describe here.

[7] Syntactically, we believe that only the *consequent* clause is an argument of *otherwise*. The *antecedent* that *otherwise* operates on is an accommodated pragmatic object, and we do not make a claim about its syntactic form. This might suggest that the term *prejacent* is more appropriate here. However, since we build heavily on the semantics of conditionals, and believe that *otherwise* relates two propositions to one another, we choose terminology that aligns with these theoretical choices.

a. The income they earn from it is likely to be the only source of cash to supplement their *otherwise* subsistence economy. (OED)

b. Amelia behaved well *otherwise*. (Flament-Boistrancourt 2011[8])

1.1 Background: The meaning of *otherwise*

As we have seen, *otherwise* acts as a discourse connective or anaphor, relating an antecedent utterance with a second utterance, by way of an accommodated proposition computed from the pronounced antecedent. A key example which we will concentrate on in this paper is the *Red Light* example, repeated here from 3. This example illustrates a key property of *otherwise*: that the continuation following *otherwise* appears to be discourse-dependent, and can't be strictly calculated based on the syntactic material preceding *otherwise*. In (9), the same material appears before *otherwise*, but with different consequents. The nature of the consequent allows us to calculate what *otherwise* is operating on, as we spelled out in 3a–3b.

(9) *The Red Light example:* = 3

a. If the light is red, stop, *otherwise* go straight on.

b. If the light is red, stop, *otherwise* you'll get a ticket.

A satisfactory approach to *otherwise*, then, requires a consideration of the structure and "flow" of information in a given discourse context. Intuitively, the *otherwise* clauses in ((9)) have the semantics of conditionals: *Otherwise* targets a set of worlds in which some anaphoric proposition does not hold (*i.e.*, converse nonimplication).

Two prior accounts of *otherwise* by Webber et al. (2001) and Kruijff-Korbayová and Webber (2001) adopt information-structural analyses of *otherwise*, which will inform our analysis in section 1.3. In particular, Webber et al. argue for the existence of a "discourse anaphor" class (comprising lexical items including *then, nevertheless, otherwise*), and a distinct class of "structural connectives" (*or, and, but, because*). These authors appeal to an 'anaphorically-derived contextual (eventive) parameter' e_i and an *inferrable relation* between two event descriptions (in the absence of an explicit structural connective). An example of these notions is given in (10):

(10) *Two types of 'inferrable relations':*

a. If the light is red, stop, (**but**) *otherwise* go straight on.

b. If the light is red, stop, (**because**) *otherwise* you'll get a ticket.

Otherwise not only operates on different accommodated propositions, as we have already seen, but can also encode different relations between two event descriptions (*contrast* in 10a, and *explanation* in 10b). For Webber et al. (2001:17), these effects are prag-

[8]Here, and throughout, examples from both Flament-Boistrancourt 2011 and Inkova-Manzotti 2002 have been translated from the original French by the authors.

matically derived, and are crucially unavailable to "structural connectives" which are restricted in the relations they can encode and the antecedents they can retrieve.[9]

This observation about the limited distribution of structural connectives has been independently made in the literature on conditional uses of *or* ('pseudocoordination', see Biezma and Rawlins 2016, Culicover and Jackendoff 1997, Klinedinst and Rothschild 2012, a.o.). As examples 11a–11b show, the distribution of these uses is narrower than the equivalent use of *otherwise*. Although a conditional *otherwise*-like reading is available in 11b, in 11a, the conjoined imperatives *stop or go straight on* must be interpreted as two options of what the addressee ought to do when the light is red. The *otherwise*-like reading that was available in 3a/10a is infelicitious here.

(11) *Conditional* or *has a more limited distribution:*

a. #If the light is red, stop, *or* go straight on.

b. If the light is red, stop, *or* you'll get a ticket.

Additional evidence that an adequate account of *otherwise* requires reference to a level of discourse representation comes from intra-sentential uses of *otherwise*, in cases such as (12). For Webber et al. (2001:7), these examples necessitate an E-type anaphor.[10] As these authors point out, this 'suggests that discourse adverbials are accessing discourse entities (in particular, eventualities) rather than signaling a structural connection between clauses.'

(12) *Intra-sentential* otherwise*:*

a. Every person selling "The Big Issue" might *otherwise* be asking for spare change. (Webber et al. 2001:7)

b. These moments give emotional ballast to what would *otherwise* be an exercise in wackiness.

On the basis of data similar to the *Red Light* example (*i.e.*, *otherwise* sentences with complex-clause antecedents), Kruijff-Korbayová and Webber (2001) model *otherwise* as a discourse connective that is sensitive to information structure in its retrieval of an antecedent. They assume that Logical Forms are partitioned into theme (θ_{is}) and rheme (ρ_{is}) "phases", which have the effect of updating a given discourse context. Following Steedman (2000), Kruijff-Korbayová and Webber (2001) assume that both θ_{is} and ρ_{is} presuppose an alternative set (cf. Rooth 1985). *Otherwise* then updates the context with the complement of (a subpart of) either ρ_{is} or θ_{is} with respect to the relevant alternative set.

Along similar lines, Inkova-Manzotti (2002) and Flament-Boistrancourt (2011) provide descriptions of the broad range of uses of French *autrement* 'otherwise.' Like English *otherwise*, the French particle requires use of context and pragmatics.[11] Some examples are provided below.

[9] A similar observation is made in Corblin (1994, 2002). Additionally, recent work on discourse particles has shown that these lexical items crucially rely on the information structure of embedding discourses and imply specific types of relations between discourse moves/information states. See for example **?** on *then* and **?** on German *ja*.

[10] Although see our analysis below, in particular section 1.5.1; for us, this move will not be required.

[11] Flament-Boistrancourt (2011) explicitly deals with distributional differences of French *sinon* and *autrement* (both are frequently translated as 'otherwise.') Francis Corblin (2002:252; pers. comm) points out that *sinon* (lit. 'if NEG') admits of a compositional analysis and an identical distribution/use to *si ce(la) n'est pas le cas...* 'if it is not the case that X...'

(13) *On peut se voir mardi.* Autrement *vendredi.*
one can REFL see Tuesday otherwise Friday

We'll see each other Tuesday. Otherwise Friday. (Inkova-Manzotti 2002:114)

(14) *Je pourrais faire une tarte. Je n'ai pas de farine.* Autrement *j'ai*
I could make a quiche I NEG.have NEG PART flour *otherwise* I.have
tout ce qu'il faut
all DEM REL.it necessary

'I could make a quiche. I'm out of flour. Otherwise I've got everything needed.'[12]
(Inkova-Manzotti 2002:122)

In the analysis proposed below, we likewise acknowledge the importance of context and pragmatic computation in the use of *otherwise*. The existing analyses surveyed here suffer from the limitation that there are no constraints on the 'range of things that can serve as antecedents' (see Kruijff-Korbayová and Webber 2001 for an explicit discussion of this issue). Likewise, Webber et al. (2001), must make reference to complex event structures, and to yet another complex mechanism of E-type anaphora for examples such as 12. We will show in section 1.5.1 that these examples are naturally unified under our analysis, so that no additional assumptions must be made for intra-sentential cases as compared to inter-sentential cases.

In the section that follows, we introduce several new observations regarding the distribution and use of *otherwise*, before spelling out a proposal which aims to capture these facts in section 1.3.

1.2 Other key properties of *otherwise*

We begin by laying out the key properties of *otherwise* that we set out to capture with our account. As we have seen in section 1.1, *otherwise* has a connective-like use. Example 5 showed that the antecedent of an *otherwise* sentence may be a declarative, an imperative, or an interrogative. Here we will concentrate on sentential cases, where *otherwise* connects two sentences, as in the *Red Light* examples in 3.

We have also established that the content of the continuation which follows *otherwise* is discourse-sensitive, and cannot be computed solely based on the pronounced content of the antecedent. This has been an important guiding observation in prior work on *otherwise*, and one that we take up in our analysis as well. We highlight here several additional properties of *otherwise* that will become important for our analysis.

1.2.1 *Otherwise* is an intensional operator

First, we argue that the notion of modality is crucial to the analysis of *otherwise*. Recall that Kruijff-Korbayová and Webber (2001) notice that the two components related by *otherwise* rely on an 'inferrable relation'. We claim this relation follows from a view of *other-*

[12] Note that in 14, *otherwise* intuitively might still be taken to be anaphoric on the proposition *Je n'ai pas de farine* 'I'm out of flour'. The speaker has everything they need for a quiche if the fact of their flourlessness is excluded from consideration (see §1.5.2).

wise as containing a modal operator, admitting of different modal flavors/conversational backgrounds. We illustrate this in (15):

(15) *Observation:* otherwise *admits different 'modal flavors':*

a. Hanna is home, *otherwise* I don't know where she could be.

b. Hanna is home, *otherwise* she's breaking curfew.

c. You must stop at the red light, *otherwise* you get a ticket.

d. You must stop at the red light, *otherwise* you continue straight.

e. You must stop at the red light, *otherwise* there'd be chaos on the roads.

The instance of *otherwise* in 15a requires an epistemic modal base for interpretation, whereas the minimally different 15b is interpreted under a circumstantial modal base. Similarly, the *otherwise* clauses in (c), (d) and (e) seem to invite a deontic, teleological and a type of counterfactual reading respectively. Our analysis below builds in this interpretive flexibility of *otherwise* (a feature of conditionals, see Kratzer 2012:65*ff*), unlike prior accounts.

In section 1.3.1, we additionally defend the claim that *otherwise* makes crucial use of *modal subordination* (Roberts 1989 *et seq.*) This allows for a description of the fact that the *otherwise* statements in the two sentences in 16 appear to have different antecedents—here, including or excluding the modal:

(16) Students are required to attend the lecture, *otherwise*...

a. ≈ If ¬□ (they ATTEND)... ...it'll be empty.

b. ≈ If ¬ (they ATTEND)... ...they'll fail the class.

1.2.2 Non-emptiness

As our paraphrases above illustrate, *otherwise* asks us to consider what would be the case in the *complement* set of worlds to those introduced in its antecedent. That is, *otherwise* induces a partition over worlds, separating them into those that satisfy the conditions in the antecedent, and those that don't. A crucial requirement on this partition is that both cells are non-empty. To illustrate this, consider the contrast in (17):

(17) a. . I must go to school, *otherwise* I'll get in trouble.

b. #I can/am allowed go to school, *otherwise* I'll get in trouble.

This judgment contrast emerges because the prejacent of necessity modal *must* in 17a eliminates a set of worlds X from the context set (*viz.* those in which I don't go to school $\overline{X}$); *otherwise* is thus able to make a claim about those eliminated worlds (namely: in all the worlds in the context set where I don't go to school, I get into trouble.)[13] Conversely, the possibility modal *can* asserts the existence of an accessible world in which I go to school, but fails to exclude any worlds from consideration in 17b. As a consequence, a relevant

[13]Notice that, like in 16, an alternative pragmatic reasoning could have led us to choose as antecedent the set of worlds in which I *must* go to school. A felicitous *otherwise* statement in such a case might be: "...*otherwise* (≈ if I didn't have to go to school), I'd skip class and go to the park." This reasoning is the focus of §1.3.

complement set is unavailable to *otherwise*; we correctly predict the infelicity of 17b in this case.

Compare this with the minimally different (18), which speakers judge as acceptable (on a counterfactual reading):

(18) I can go to school, *otherwise* I wouldn't be able to get an education.

Here, again following Kratzer (1981), the modal auxiliary *can* makes available a set of relevant propositions, including the fact that 'I am able to go to school.' This set of facts (a "circumstantial conversational background") restricts the context set. The resulting assertion is that — in those possible worlds where the relevant circumstances do not hold (*i.e.,* where it is *not the case* that I am able to go to school) — I don't receive an education. As a consequence, there is a non-empty complement set of worlds in which to evaluate the *otherwise* sentence. In (18), despite the presence of a possibility modal, we are still universally quantifying into the antecedent proposition.

Our account in section 1.3 will be able to explain the felicitous use of *otherwise* in such sentences. We return to this non-emptiness constraint on the distribution of *otherwise* and its consequences in section 1.4.

1.2.3 An *otherwise* sentence is non-commutative

Another observation that will inform our analysis is that *otherwise* is not a symmetric operator: p *otherwise* q is different from q *otherwise* p, even in cases where the two propositions related by *otherwise* are logically independent of one another — so that an 'inferrable relation' is difficult to establish.

(19) *Word order is important in an* otherwise *sentence:*

a. She's in the living room. *Otherwise*, she's in the bathroom.

b. She's in the bathroom. *Otherwise*, she's in the living room.

(20) a. . She'll be here. *Otherwise* she's in big trouble.

b. $^{?\#}$She's in big trouble. *Otherwise* she'll be here.

Example (19) shows that even when the two utterances related by *otherwise* appear to be independent, speakers perceive a difference in the felicity conditions and contexts in which the two variants of the *otherwise* sentence will be appropriate. Roughly: 'my first guess is that she's in the {living room/kitchen}; if it turns out that she's not there, then she'll be in the {bathroom, living room}.'[14] Predictably, then, the contrast between the two sentences in 20 shows when an 'inferrable relation' (here: causality) *is* introduced, changing the order of the two propositions connected by *otherwise* may lead to infelicity.

[14]See section 1.2.5 for more relevant discussion. Additionally, Ford 1997 provides a discussion of some discourse pragmatic effects of conditionals which is consonant with these observations about speaker commitment.

1.2.4 An *otherwise* sentence is conjunctive

An additional crucial component of our analysis is the behavior of an *otherwise* sentence as a kind of asymmetric conjunction, as evident from the paraphrases we have been providing, as well as the fact that it is non-commutative: the speaker puts the antecedent on the table for adoption, but also includes an explicit claim about how the world must be in case that antecedent is rejected or denied. Very broadly, in words, we might then say that *otherwise* asserts: p; and if not p, then q will hold:[15,16]

(21) *An informal description of the meaning of a* p otherwise q *sentence:* (to be revised)

$$p \wedge (\text{if } \neg p', \text{ then } \Box q)$$

If a sentence of the form p *otherwise* q has conjunctive semantics (as proposed in (21)), this ought to predict that its negation could be achieved by falsifying the first conjunct, the second conjunct, or the entire assertion. We show that this is the case in (22):

(22) *Negating an* otherwise-*sentence shows its conjunction-like behavior*

A:. $\underbrace{\text{Sam is always home by 6pm,}}_{p}$ *otherwise* $\underbrace{\text{little Susie has a tantrum.}}_{\text{if } \neg p, \text{ then } \Box q}$[17]

B:. That's not true…

a. He often gets home late, and Susie's just fine.

b. Susie would be just fine if he did ever get home later, although it's true that Sam always get home on time.

c. He often gets home late, although it *is* true that little Susie indeed has a tantrum whenever that happens.

In (i), the speaker is negating both conjuncts: Sam isn't always home on time ($\neg p$), but Susie doesn't have a tantrum because of that ($\neg p \wedge \neg q$).[18] In (ii), only the second conjunct is negated: we assert that the first conjunct is true (Sam is always home on time), but that the implication nevertheless doesn't hold (Susie wouldn't have a tantrum if Sam were late). In (iii) only the first conjunct is negated: we assert that Sam is late ($\neg p$); but the implication in the second conjunct holds: if Sam is late, Susie has a tantrum.[19]

[15] Throughout, we adopt (and provide additional support for) a view of conditionals as a flavour of modality where a restriction on the modal base is syntactically explicit, as in Heim 1982, Kratzer 1981, 2012, Lewis 1975, among others. Crucially, note that this restriction (p') is calculated from, but need not be identical, to the syntactic antecedent (p), hence the *Red Light* examples 3. The nature of this calculation is discussed in detail in §1.3 below.

[16] Note also the similarity of this treatment to 'information parameter change' readings of structural connective *or* as formalized by Klinedinst and Rothschild (2012:155-6). On their dynamic (update semantic) account, an utterance of the form 'α or β' corresponds to $[\![\beta]\!]^{c,s_{\neg\alpha},w}$ (*i.e.*, an utterance of β where the "information parameter" s is updated with $\neg\alpha$ (the negation of the first disjunct)).

[17] As with other examples we have seen, there are (at least) two possible antecedents to *otherwise* in this example: the sentence with the frequency adverbial *always* and the sentence embedded under *always* (i.e. its prejacent). We have kept the antecedent constant (sc. $p = p'$) across these examples for consistency.

[18] Recall that material implication is false just in case that its antecedent is true and its consequent is false. In (21), the implication under consideration is if $\neg p$, then $\Box q$. So, it is false just in case $\neg p \wedge \neg\Box q$. Recall further that $\neg p \rightarrow \neg\Box p$. (If p doesn't hold, then *must* p doesn't hold.)

[19] Some speakers we have consulted find our example with 'always' difficult to process, and prefer a variant

1.2.5 Weakening the antecedent

We have proposed that *otherwise* can be understood as encoding a type of asymmetric conjunction: the speaker puts the antecedent on the table for adoption, but also includes an explicit claim about how the world must be in case that antecedent is denied. As a consequence, we might predict the redundancy of *otherwise*-sentences with non-modalized antecedents like those in (23), contrary to fact:

(23) *Non-modalized antecedents should lead to infelicitous otherwise statements but they are acceptable:*

a. Hanna is home, *otherwise* she's breaking curfew. = 15b

b. Sam is always home by 6pm, *otherwise* little Susie has a tantrum. = 22

On the surface, both of these cases ought to be infelicitous: if I assert that, in the actual world, Hanna is home, then asserting the conjoined proposition that *If Hanna isn't home* (in the actual world) *then she's breaking curfew* ought to be judged as redundant. Similarly, if I'm willing to assert that *Sam is always home by 6pm*, then the claim that Susie has a tantrum shouldn't be verifiable in the actual world.[20]

In both of these cases, the felicity of the *otherwise* clause appears to function as a type of hedge that requires the accommodation of a "weakened" p. For 23a, notice that in contexts where the speaker has direct perceptual access to the subject, the sentence is severely degraded. (23)[a′] is infelicitous unless the speaker can be interpreted to have incomplete knowledge of where they are.[21]

(23) a. ??I'm home right now, *otherwise* I'm breaking curfew.

Consequently, we take it that while the speaker of a sentence like 23a is willing to confidently assert p, their addressee accommodates information about their evidence base for this assumption on the basis of their willingness to admit of an alternative.

By virtue of a similar pragmatic mechanism, the interpretation of 23b involves accommodating a weakened assertion of p. The speakers we have consulted appear to go about this in two different ways, paraphrased below:

(24) b′. Sam is **normally/usually** home by 6pm, *otherwise* **(when he's not)** little Susie has a tantrum.

b″. **These days,** Sam is always home by 6pm, *otherwise* **(in the past, when he was sometimes late)** little Susie **would have** a tantrum

By weakening the quantificational force of the adverbial (24)[b′] or restricting the domain to stage-level predication (24)[b″], real-world alternatives to 'Sam BE home by 6pm' are made available. Both repairs allow for a non-empty complement set of worlds for *otherwise* to refer to, satisfying the *non-emptiness requirement* we discussed above.

with 'often'. The same point could be made with such an alteration, but we find our variant in the text even more striking. See section 1.2.5 for a relevant discussion.

[20] This follows from a Stalnakerian view, where, by asserting p, we are proposing to eliminate all non-p worlds from the Common Ground (e.g. Stalnaker 1979).

[21] Compare von Fintel and Gillies' 2010 treatment of epistemic *must*, the (evidential) use conditions of which are met in this scenario (*viz.* INDIRECT INFERENCE.) Given the (conditional) modal component of *otherwise*, their analysis might be taken to extend to the use of *otherwise* in these hedged contexts.

Conversely, weakening is not necessary when we have an imperative or an interrogative antecedent, as both types of clauses by their nature always allow for a non-empty complement set of worlds: an addressee may fail to act on a command, admitting both worlds that satisfy the command and those that don't; likewise, polar and alternative questions presuppose more than one possible answer, requiring a partition with non-empty cells.[22] Along similar lines, when the consequent of *otherwise* is counterfactual, the non-emptiness requirement can be satisfied without weakening the antecedent:

(26) I'm home right now, *otherwise* I'd be breaking curfew.

In the next section, we build on these observations about the nature of *otherwise* to develop an analysis rooted in dynamic semantics, and making use of the information structural notions of the Question under Discussion.

1.3 Analysis

Our analysis draws on tools from the dynamic semantics and information structural literatures to model *otherwise*'s semantic contribution to a sentence. Section 1.3.1 introduces Discourse Representation Theory (Heim 1982, Kamp 1981), and in particular the notion of "modal subordination" (Roberts 1989, 1990, 1995, 2004, 2012). Section 1.3.2 lays out our proposal for the semantics of *otherwise*. It discusses previously unremarked limitations on the distribution of *otherwise*, and shows that they naturally follow from the modal subordination analysis we lay out. Finally, section 1.3.3 illustrates our proposal for the pragmatics of *otherwise*, and in particular how information structural notions (notably, the *Question under Discussion*) can be recruited to provide a treatment of *otherwise* as a discourse anaphor (in the sense of Webber et al. 2001 a.o.). An appendix to the paper provides a more detailed formal definition of modal subordination, in particular as it relates to a formal treatment of the "satisfaction conditions" of *otherwise*.

1.3.1 Background: Discourse representation & modal subordination

As we have seen, a key property of *otherwise* is its interpretational flexibility, which we have characterized as going beyond what is strictly contributed by the pronounced utterance it is contained in. A number of authors have proposed dissociated syntactic and semantic notions of "subordination" (e.g. Culicover and Jackendoff 1997, De Vos 2007, Yuasa and Sadock 2002), noting the ostensible independence of these modules. In particular, Craige

[22] A prediction that follows from this discussion here is that *wh*-questions will not serve as felicitous antecedents for *otherwise*. Although constituent questions have been argued to impose a partition over the possible worlds in the context (e.g. **?**), there will not be a *complement* set for *otherwise* to refer to:

(25) a. ??Who wants to present first in the seminar? *Otherwise* Max will.

b. ??Where do you want to go? *Otherwise* we can stay home?

Unlike in the case of declaratives, we are not able to offer a repair such as modal weakening, and instead the examples are judged as marginal. For some speakers, the negations of these questions' presuppositions — *viz.* 'if there is noone who wants to present' and 'if there is nowhere that you want to go' — are retrieved (sc. accommodated) with a long pause (and some amount of effort.) We discuss other cases of infelicity due to a lack of a non-empty complement set in section 1.4.

Roberts' (1989) "modal subordination" formalism provides a way of capturing this dissociation, and consequently of explaining the different interpretations of *otherwise* that appear to be available in the *Red Light* sentences 3.

Roberts (1989) adapts *Discourse Representation Theory* (DRT), developed in Kamp 1981/Heim 1982, in order to formally implement a notion of subordination which operates independently of the syntax (i.e. where even in the absence of a conventional trigger, the interpretation of some quantificational operator is restricted.) Her definition of this is given in (27).

(27) MODAL SUBORDINATION is a phenomenon wherein the interpretation of a clause α is taken to involve a modal operator whose force is relativized to some set β of contextually given propositions. (Roberts 1989:718)

In effect, modal subordination provides a way of understanding the relationship between sentence mood and the nature of an assertion in context. It operationalizes the insights of work on the structure of natural language quantification (*i.e.*, the conception of modalized sentences as generalized quantifiers that relate 'restrictor' and 'scope'). An illustrative example is provided in (28).

(28) *An example of modal subordination in discourse:*

a. If Edna forgets to fill the birdfeeder, she will feel very bad.

b. The birds will get hungry. (Roberts 1989:683)

Notice that the birds need not get hungry (an entailment of (28)[b], if it were to act as a standalone assertion) for the entire discourse to be true. Instead, (28)[b] is *modally subordinate* to (*i.e.*, its interpretation is dependent on) the conditional antecedent in (28)[a]. Because the modal operator *will* is restricted by the antecedent of (28)[a], only in a context in which the antecedent conditions in (28)[a] are met must the consequent condition in (28)[b] also be satisfied.

We take statements involving *otherwise* to rely on a similar logic. As we have seen, the pronounced form of *otherwise* sentences underdetermines their interpretation. Appealing to modal subordination allows us to identify the relationship between the linguistic signal and its likely interpretation. Roberts (1989:712–5) provides a formal syntax and semantics for modal interpretations of DRSs. The pertinent details are presented here.[23]

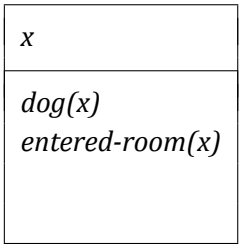
Next we provide a basic overview of how to interpret the "box diagrammatization" of Discourse Representation Structures (DRSs), familiar from Kamp 1981, Partee 1984, Roberts 1989, 1990, a.o. These visualization conventions are associated with a formal language (the Discourse Representation Language, DRL), releevant components of which are sketched in the appendix to this paper.

For a given DRS K, K denotes a pair $\langle X_K, C_K \rangle$, where X represents the *local domain* – a finite set of variables that represent discourse objects relevant in the context (including participants, eventualities, and times etc.); and C is a finite set of 'satisfaction conditions' that eventually determine the truth value of a given proposition. For diagrams where a

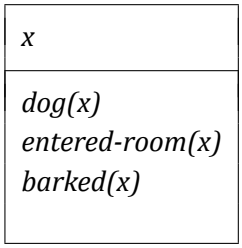
[23] An appendix to this paper provides some additional technical detail. The interested reader is referred to Roberts (1989, 1990) for a closer reading about the formal apparatus of modal subordination. See also **?**:47–58 for a detailed formal presentation of a Discourse Representation Language (DRL) that handles temporal relations.

DRS K is represented as a box, the top of the box lists the variables X_K and the bottom represents the satisfaction conditions C_K. For a simple discourse as in (29–30), we provide a DRS below. Notice that the indefinite is treated as a variable here, and is eventually existentially closed (Heim 1982): any variable that is not locally bound by another operator is assumed to be existentially bound by a global operator that applies to variables that remain free by the end of the derivation. DRT allows us to continue to refer to a variable introduced in the prior discourse as long as it is still accessible, as illustrated for the simple example here:

(29) A dog entered the room.

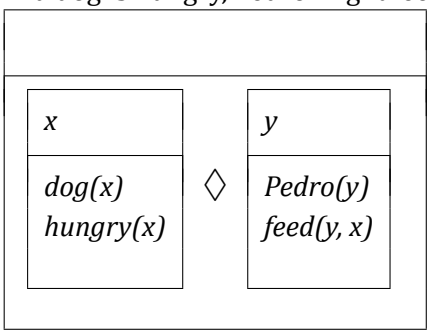


(30) It barked.



A given DRS K contains atomic conditions of the form $P(x_{i_1}...x_{i_n})$ (where P is an n-place predicate). If a world-assignment pair **satisfies** $(\Vdash)$ all of the conditions in K, then that pair can be said to **verify** $(\vDash)K$. Additionally, DRSs are recursively closed under the operations $\neg, \bigvee, \Rightarrow, \Box, \Diamond$. That is, if K_i, K_j are DRSs and $\circ$ is one these (2-place) operators, then $K_i \circ K_j$ can represent a *complex condition* in K. This complex condition needs to be satisfied by w, if K is to be verified in w.[24] Here is an example using the possibility modal, illustrating that the variable x, which is introduced in the box to the left of the operator, remains accessible in the box on the right:

(31) If a dog is hungry, Pedro might feed it.



Crucial to the theory is the notion of an "accessible domain" A_{K_i} – a superset of the local domain (X_{K_i}) for any given K_i. As a discourse proceeds, the set of objects that can be referred to expands. The notion of 'accessibility', then, allows us to predict which objects can be referred to at a given stage in a discourse.

[24] The semantics and interpretation of these operators is further discussed below, though Roberts (1989:714) provides formal satisfaction conditions for all condition types that she defines. See the appendix to this paper for some additional detail.

(32) The accessible domain A_{K_i} contains all the variables that occur:

a. In K_i's local domain (X_{K_i})

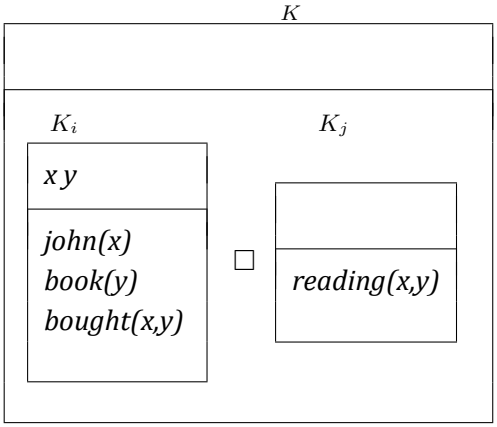
b. In the domains of all DRSs that graphically *contain* K_i

c. If K_i is the right element of a (binary) modal condition $(\Rightarrow, \Box, \Diamond)$, A_K also contains all the elements of the antecedent's (the DRS on the left's) local domain. *I.e.* $K_\ell \,\Box\, K_i \;\longrightarrow\; K_\ell \leqslant K_i$ where '$\leqslant$' reads "is accessible from."

In (31), observe that the consequent box of the conditional makes reference to a variable introduced in the antecedent. Furthermore, note that the entire conditional statement is embedded inside a larger discourse, so that we are not committed to the existence of any dog in the context: the *feeding*-worlds are a subset of *hungry-dog*-worlds.

Based on the assumptions introduced in (32), a given DRS K that is interpreted in the scope of a modal operator can be *modally subordinate* to those DRSs whose domains it has access to. Example **??** illustrates such a case, from Roberts (1989:701) . Here, the consequent clause is *modally subordinate* to the antecedent *in a given conversational background*. That is, the entire conditional is taken to assert that the speaker predicts that 'John will be at home reading a book' in those worlds *(that best conform with the speaker's expectations)* in which he bought a book. Like in (32), we need not be committed to the fact that John bought a book in the actual world; in other words, the entire statement is not a part of the matrix DRS K; it is further embedded.

(33) *A DRS illustration of modal subordination in a conditional sentence:*
If Jake bought a book, he'll be at home reading it by now.



In (33), the DRS representing the consequent clause (K_j) is *modally subordinate* to its antecedent K_i and, as a result, can access the discourse entities introduced in K_i (i.e. $K_i \leqslant K_j$). Moreover, both K_i and K_j are subordinate to the matrix DRS K (i.e. $K \leqslant K_i \leqslant K_j$); had any variables been introduced in K, they would have been accessible to both K_i and K_j.

1.3.2 A dynamic semantics for *otherwise* and the role of discourse

We are now ready to propose a semantics for *otherwise*. At this juncture, recall again the key properties of an *otherwise* sentence described in section 1.2. *Otherwise* is an intensional operator that encodes a type of conditional modality; it asserts that – in the complement of a set of worlds introduced by its antecedent – some condition holds. This antecedent need

not be identical to the pronounced utterance preceding *otherwise*, but is somehow related to it. Moreover, the operator is non-commutative: there appears to be an ordering component, whereby only the antecedent is asserted as true in the evaluation world (although, as discussed, the process we called "modal weakening" allows for consideration of what happens if it were not.) We believe that these properties lend themselves to a dynamic account; one concerned with the development of participants' information states across the discourse.

We argue here that the possible sets of propositions that are available to constrain the interpretation of *"otherwise* K_j*"* are calculated on the basis of those discourse representations which **have access to** (*i.e.*, are contained within) the pronounced antecedent to *otherwise*, which will refer to throughout as $\boldsymbol{K_i}$. We will illustrate that this is so in the next two sections. Before doing so, we first define an operator over DRSs: $\ominus$ (and hence the condition $K_i \ominus K_j$) will represent the contribution of *otherwise*:[25]

(34) *Proposal: A dynamic semantics for* otherwise
$K_i \ominus K_j \Longleftrightarrow (K_i) \wedge (\neg K_{i_{\text{sub}}} \Box K_j)$
In words: $K_i \ominus K_j$ is satisfiable iff both K_i and $(\neg K_{i_{\text{sub}}} \Box K_j)$ are satisfiable, where $K_{i_{\text{sub}}}$ is some DRS that is contained within K_i.[26]

This proposal can be paraphrased as the claim that: "the conditions in K_i (should)[27] hold; however, just in case that (some of) these conditions — those of $K_{i_{\text{sub}}}$ — do not hold, the conditions in K_j must then hold." Notice that this treatment takes *otherwise* to be akin in its structure to a conditional, referencing our informal description in 21 and elsewhere. Moreover, this brings an asymmetric conjunctive element into the analysis, building on the observations in section 1.2 and recalling elements from previous analyses discussed in section 1.1.

Notice additionally that we employ the necessity operator ($\Box$) from Roberts' DRL (1989:695, 715), building on our observation in 15 that *otherwise* comprises a modal operator. A primary contribution of Roberts 1989 is an expansion of the ontology of the discourse representation theory of Kamp 1981 to include worlds, in view of modeling modality. In effect, $\Box$ is a universal quantifier which also builds in "conversational backgrounds"—sets of propositions: a modal base m and ordering source o—in order to capture the observations made by Kratzer (1981:§2.7) regarding different "flavors" of modality.

In effect, $K_i \underset{m,o}{\Box} K_j$ is satisfiable iff K_j can be verified in all the worlds in the conversational background (as determined by m, o) in which K_i can be verified. Consequently a DRS containing the condition $K_i \underset{m,o}{\Box} K_j$ can be instructively rewritten as in (35):[28]

[25] Again, a formal treatment of this proposal (*sc.* an extension of the DRL to include conditions of the type $K_i \ominus K_j$) is spelled out in the appendix.

[26] More precisely, these conditions will be satisfied by the same set of world-assignment pairs $\langle w, g \rangle$. See below for more discussion of the determination of $K_{i_{\text{sub}}}$.

[27] Recall our discussion of "modal weakening" in 1.2.5.

[28] Where $\underset{o(w)}{\text{BEST}}$ is a function that takes a set of worlds and returns the "best" worlds as determined by an ordering source o (i.e. those worlds in m best conforming to the ideal contained in o.) Adapting from von Fintel and Heim (2011), $\underset{o(w)}{\text{BEST}}(\cap m(w)) = \{w' \in \cap m(w) \mid \neg\exists w''[w'' \underset{o(w)}{\prec} w]\}$.
This same function is sometimes also given as ***max*** (e.g. Hacquard 2006, von Fintel and Heim 2011, von Fintel and Iatridou 2008, a.o.) or ***O(pt)*** (Schwager 2006:247).

(35) *Roberts' necessity operator* $\Box$ *as a universal quantifier:*
$K_i \underset{m,o}{\Box} K_j \Longleftrightarrow \forall w' \in \underset{o(w)}{\textsc{best}}\big(\cap m(w)\big) : w' \vDash K_i \rightarrow w' \vDash K_j$

In words: The condition $K_i \underset{m,o}{\Box} K_j$ is satisfied in *w* for all the best worlds w' (according to o) in a given modal base m, if it holds that if w' satisfies the conditions of (*i.e.,* verifies) K_i, then it also satisfies the conditions of K_j.

Simplifying the statement in (35) somewhat for current purposes, each of the three expressions on the right of the arrow can be understood as representing a set of worlds which verify a given condition set: (a) w' is among the 'best' worlds according to some contextually-determined criteria, (b) the conditions in K_i are satisfied in w', and (c) the conditions in K_j are satisfied in w'. We will see how this plays out below.

Although, as 34–35 makes clear, $\ominus$ is expressible in terms of other defined operators over conditions (viz. $\neg$ and $\Box/\Rightarrow$), we use the notation $\ominus$ for both convenience as well as to define an *otherwise* condition in the DRL, thus showing how the language can deal with phenomena like the *Red Light* sentences.

Notice further that the definition in (35) leads to the following accessibility relations:

(36) *The accessibility relations determined by* otherwise*:*
$(K_i \ominus K_j \in C_K) \rightarrow (K \leqslant K_i \leqslant K_j)$

It follows from (36) that the condition $K_i \ominus K_j$ entails that the information contained in K_i is accessible to K_j (and both have access to some broader discourse context K that they are embedded in).

1.3.2.1 Representing modality in DRL

We return now to the notion of modality and its importance to the ambiguity that arises in *otherwise* sentences. Consider again the *Lecture sentence* data in 16, repeated as 37. Once again, there are two distinct interpretations of *otherwise*:

(37) Students are required to attend the lecture, *otherwise*...

a. $\approx$ If $\neg\Box$ (they ATTEND)... ...the room will be empty.

b. $\approx$ If $\neg$ (they ATTEND)... ...they'll fail the class.

Roberts (1989:700) notes that "[for] sentences which are not conditional in form, modal subordination involves the pragmatic accommodation of a contextually salient [set of propositions] to serve as the antecedent for the nonfactual clause." For 37, this means the necessity operator is taken to be restricted by some accommodated set of propositions—Kratzer's *conversational backgrounds* (marked β in (38), recalling the definition of modal subordination given in 27).[29]

[29] Roberts (1989) doesn't represent an "antecedent" box for non-conditionals. This is taken to be a shorthand for a situation in which the modal operator retrieves conversational backgrounds that directly restrict the (realistic) context set ($\cap cg$). For our purposes, however, it will become important to explicitly spell this set out.

(38) *The components of a necessity modal under a Kratzer-Roberts framework:*

$$\underset{m,o}{\Box} K_c \Longleftrightarrow \underbrace{K_m}_{\substack{\text{conversational}\\ \text{background } (\beta)}} \Rightarrow \underbrace{K_c}_{\text{prejacent } (\alpha)}$$

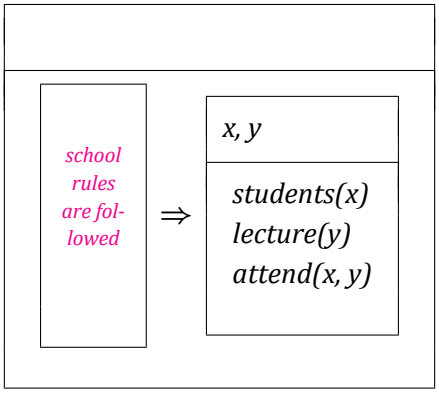
In a sentence with the modal operator $\Box$, the prejacent clause (α) is interpreted as being modally subordinate to a (pragmatically-determined) set of propositions β, called conversational backgrounds.

In DRS terms, this means that necessity modals claim that for all embeddings of K_m (a DRS whose satisfaction conditions are determined by the conversational backgrounds), there is an embedding for K_c.

In 37, then, the prejacent *students attend the lecture* is interpreted in view of those worlds in which "the school rules in w are best followed." That is, $\forall w'[w' \in \underset{deo(w)}{\text{BEST}}\big(\cap \underset{\text{CIRC}}{m(w)}\big) \rightarrow \text{ATTEND}(w')]$. This is illustrated by DRS structure in (39):

(39) *A DRS representation for K_i: the pronounced antecedent in 37*
Students are required to attend the lecture.

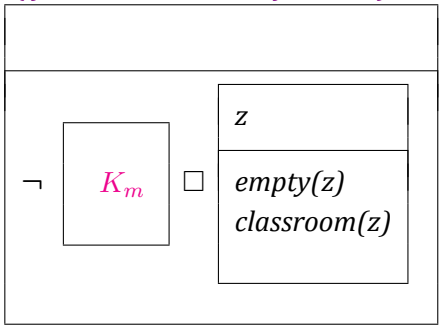
$K_i = \ K_m \Rightarrow K_c =$



The first *otherwise*-consequent in 37a leads to the accommodation of the conversational background of the modal antecedent (represented in (39) as K_m) as the antecedent proposition to *otherwise*, $K_{i_{\text{sub}}}$.

(40) *A DRS structure for the otherwise clause in 37a*:
Otherwise (if school rules aren't followed) the classroom will be empty.

$\neg K_{i_{\text{sub}}} \Box K_j =$



SUMMARY:

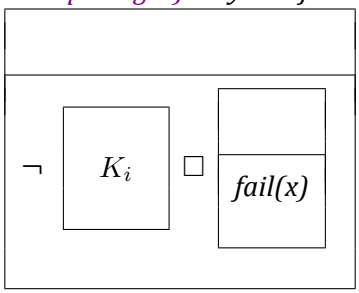
K_i : *school rules* ⇒ *attend*
$K_{i_{\text{sub}}}$: *school rules are followed*
K_j : *empty*

Conversely, in 37b, *otherwise* quantifies over the complement of the set of worlds in which students attend lectures *relative to* worlds in which they are required to do so. That is, *otherwise*'s contribution is to assert that *failing*-worlds include all those worlds where students' attendance *is* a requirement (K_m) that they do *not* observe $(\neg K_c)$. In 41 we provide a DRS representation of this denotation, where we accommodate the entire pronounced

antecedent (represented in (39) as K_i) as the antecedent proposition to *otherwise*, $K_{i_{\text{sub}}}$.[30]

(41) *A DRS structure for the consequent of 37b*:[31]
Students are required to attend the lecture. Otherwise (if they don't attend despite school rules requiring it) they will fail.

$\neg K_{i_{\text{sub}}} \Box K_j =$



SUMMARY:
K_i : *school rules* ⇒ *attend*
$K_{i_{\text{sub}}}$: *school rules* ⇒ *attend*
K_j : *fail*

1.3.2.2 Representing conditionals in modality-sensitive DRL

We adopt a representation of conditionals as a species of modality — conditionals differ from modals insofar as the syntax of a conditional proposition permits for a (partially) *explicit* restrictor. That is, the conditional antecedent constitutes a temporary restriction on the common ground, and the consequent only holds in worlds which satisfy the conditions in the antecedent. Like with modals, however, we assume that conditionals always additionally encode a (usually *implicit*) modal base. In concert with the conversational backgrounds discussed above (an ordering source $o(w)$ which induces an ordering over $m^+(w)$) (Lewis 1975), we can model different subtypes of conditionals (deontic, counterfactual, etc., see Kratzer 2012:39, 66*ff*), as shown in (42).

(42) *Definition: a conditional modal base (following Kratzer 2012:65, 94)*
A conditional modal base $m^+(w) = \bigcap \big(m(w) \cup \{p\}\big)$ is given by intersecting some modal base $m(w)$ with an antecedent proposition p. This conditional modal base along with the same ordering source are then inherited by the consequent q.

Because it is important to the current analysis to separately discuss and access each of these two sets of propositions — the one introduced (explicitly) by the antecedent and the one introduced (implicitly) by the modal base — we draw on this insight to decompose $K_a \underset{m,o}{\Box} K_c$ as given in 43.[32]

[30] Notice that $\neg K_i = \neg(K_m \Rightarrow K_c) = K_m \wedge \neg K_c$. That is, the negation of K_i is verified in precisely that set of worlds in which students are required to attend lecture and yet they do not do so.

[31] In 39, which shows the denotation of the pronounced antecedent proposition to *otherwise*, K_i, the variable x is used to represent the set of students. The consequent clause of *otherwise* will be subordinate to its antecedent, and hence we used the same variable x to denote the same set of students introduced there.

[32] We use the notation ⋒ to illustrate an operator that takes a DRS K_m representing (a possibly implicit) set of conversational backgrounds and intersects the modal base with those worlds that satisfy the conditions in the antecedent K_a. As alluded to in fn 26, technically these definitions treat DRSs and the sets of worlds in which their conditions are satisfied as the same type. This is a heuristic decision that best facilitates the discussion in the text. We do not spell out an alternative formalization using $\langle w, g \rangle$ here as it will take us too far afield into the formal definitions of modal dynamic semantics, although see the appendix, especially 89 for more explanation and a partial operationalization (*i.e.*, a description of the possible condition sets for K_m / K_{m^+}.)

(43) *Decomposition of the complex □ condition:*

$$K_a \underset{m,o}{\Box} K_c \Longleftrightarrow \underbrace{K_m \Cap K_a}_{K_{m^+}} \Rightarrow K_c$$

$$\Longleftrightarrow \left(\underset{o(w)}{\textsc{best}}(\cap(m(w) \cup K_a\right) \Rightarrow K_c$$

In words: The condition $K_a \underset{m,o}{\Box} K_c$ is satisfied in a world w if K_c is satisfied in all the best worlds (according to $o(w)$) in a modal base $m(w)$ that have been updated with the conditions in K_a.

As we will show next, this approach, where conditionals and modals are given parallel analyses (specifically, where conditionals are viewed as a species of modality), permits for an analysis of the *Red Light* examples that is parallel to the *Lecture* examples from above.

1.3.2.3 Analysis: A third *Red Light* sentence

We return now to the famous *Red Light* examples. Recall that the prior literature identifies two possible readings for the *Red Light* examples, which we spell in set terms in our paraphrases below:

(44) *The Red Light examples, repeated:* (= 3)

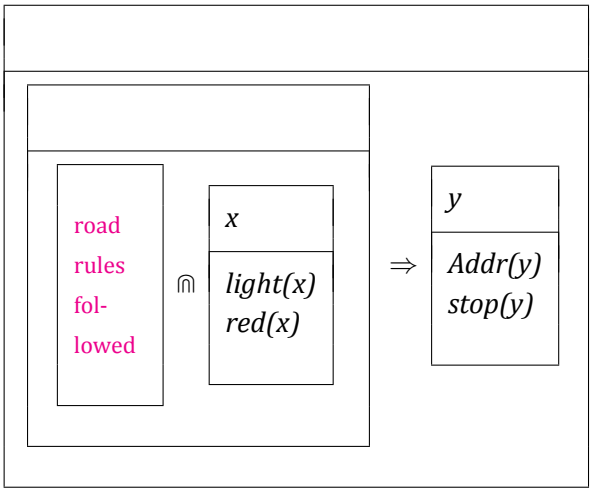
a. If the light is red, stop. *Otherwise* go straight on.
≈ in worlds in which the light isn't red... . If the light is red, stop.

Otherwise you'll get a ticket.
≈ in worlds in which the light is red but you don't stop...

In (45), we provide a DRS structure for the pronounced antecedent in these examples, K_i. As in the *Lecture* examples, we explicitly spell out the contribution of the modal base; here we use the shorthand "road rules followed":

(45) *A DRS structure for the pronounced antecedent in the* Red Light *examples:*
If the light is red, stop.

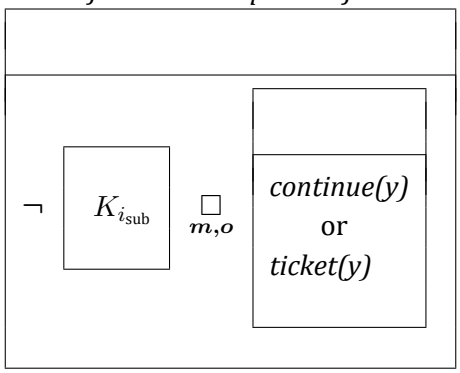
$K_i = K_a \underset{m,o}{\Box} K_c =$



This pronounced antecedent in (45) serves as the DRS K_i in our proposal for *otherwise* in 34: $K_i \ominus K_j \Longleftrightarrow (K_i) \wedge (\neg K_{i_{\text{sub}}} \Box K_j)$. Next, the consequents of the *Red Light* examples will have the same DRS structure, the skeleton of which is shown below:

(46) *A skeleton* DRS *structure for the consequents of the* Red Light *examples:*

$\neg K_{i_{\text{sub}}} \underset{m,o}{\Box} K_j =$



The usefulness of the explicit representation of the modal base in the *Red Light* examples becomes clear at this point: before turning to the identification of $K_{i_{\text{sub}}}$ in each example above, we first identify a third, as of yet unnoticed reading of the *Red Light* sentence, illustrated in (47):

(47) *A third reading of the Red Light example:*
If the light is red, stop. *Otherwise* there'll be chaos on the roads.
≈ in worlds in which the rules of traffic aren't obeyed…

Although it may seem similar to the paraphrase in 44a, we argue that it is different. In (47), the relevant situation is not simply one in which *you* don't stop, but rather where *no one* stops — or at least where it's impossible to predict if anyone does: *no one* obeys the rules of traffic.[33]

Here the importance of our dynamic approach to *otherwise* comes into play. We can view the pronounced antecedent to *otherwise* in the *Red Light* example as a series of updates to the common ground, each of which serves to (monotonically further) restrict the set of worlds under consideration in the sentence. We illustrate this in words in (48), and diagramatically, in Figure 1.

(48) *The pronounced antecedent in 47 as a series of contextual updates:*
Pronounced antecedent: *If the light is red, (you) stop.*

a. In worlds in which the rules of traffic are followed, … $\textsc{best}\Big(\cap m(w)\Big)$

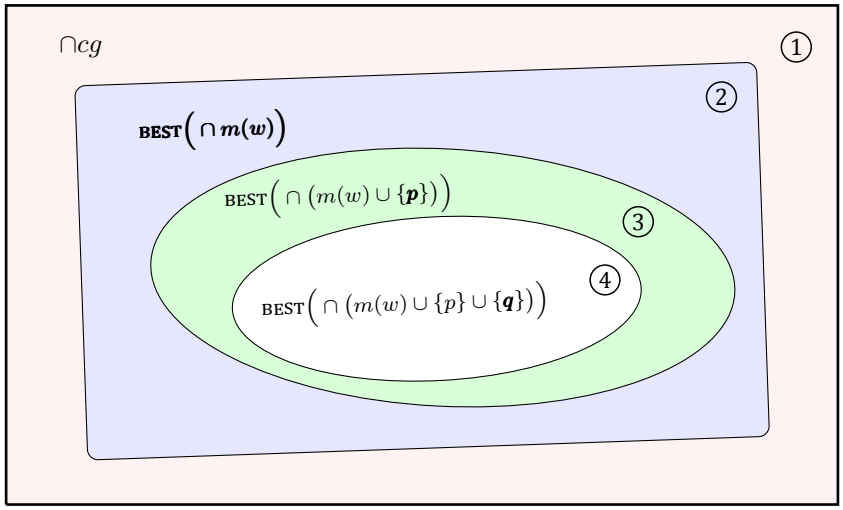
b. In worlds in which the light is red, … p

c. You stop. q

We propose that the antecedent proposition to *otherwise* — namely, that set of worlds whose complement the consequent of *otherwise* applies in, $K_{i_{\text{sub}}}$ — can be any one of these updates in Figure 1. We spell out the resulting denotations of the three readings of the *Red Light* examples in (49), where $\overline{X}$ denotes the complement of the set X.

[33] Note that it is not clear how previous information structural approaches to *otherwise* would handle this different reading.

Figure 1.1. Updates to the common ground as monotonic restrictions on the set of worlds under consideration. *Otherwise* can "target" the complement set of one of these restrictions (*i.e.*, any of the three disjoint, shaded regions).



(49) *Accommodated antecedent sets available in the* Red Light *sentences:*

a. *If the light is red, (you) stop.* *The pronounced antecedent*
(i.e. in those worlds w' in which the road rules are followed and the light is red, you stop)

$$\{w' \in \underset{deo(w)}{\text{BEST}}(\underset{\text{CIRC}}{\cap} m(w)) \mid \text{RED.LIGHT}(w') \rightarrow \text{STOP}(w')\}$$

b. *...otherwise there'd be chaos on the roads.* =47
(i.e. in those worlds w_1 where the road rules aren't followed)

$$\{w_1 \mid w_1 \in \overline{\underset{deo(w)}{\text{BEST}}(\underset{\text{CIRC}}{\cap} m(w))}\} \qquad = ① - ②$$

c. *...otherwise you can continue.* =44a
(i.e. in those worlds w_2 where the road rules are followed, but the light isn't red)

$$\{w_2 \mid w_2 \in \underset{deo(w)}{\text{BEST}}\Big(\underset{\text{CIRC}}{\cap}\big(m(w) \cup \overline{\text{RED.LIGHT}}\big)\Big)\} \qquad = ② - ③$$

d. *...otherwise you'll get a ticket.* =44a
(i.e. in those worlds w_3 where the road rules are followed and the light is red, but you don't stop)

$$\{w_3 \mid w_3 \in \underset{deo(w)}{\text{BEST}}\Big(\underset{\text{CIRC}}{\cap}\big(m(w) \cup \text{RED.LIGHT} \cup \overline{\text{STOP}}\big)\Big)\} \qquad = ③ - ④$$

The three denotations in (b–d) correspond to the three DRSs that are modally subordinate to K_i, which we have argued represent the set of possible accommodated antecedents in the *Red Light* examples:

(50) *DRSs subordinate to K_i which can serve as the accommodated antecedent ($K_{i_{\text{sub}}}$) to* otherwise*:*

a. **The modal base (K_m)**:
Road rules are followed

b. **The conditional antecedent (K_{m+})**:
Road rules are followed and the light is red.

c. **The entire conditional (K_i)**:
If road rules are followed and the light is red, (then you) stop.

To see that other choices of antecedent are unavailable, we consider next another possible variant of the *Red Light* example which, all things being equal, we might have expected to be felicitous. However, example 51, adapted from Kruijff-Korbayová and Webber (2001:76), appears to encounter interpretation problems: it is judged by speakers as either infelicitous or false.[34]

(51) #If the light is red, stop; *otherwise* you'll get rear-ended.
INTENDED ≈ If the light is not red and you do stop...

The intended interpretation of *otherwise* in 51 relies on the accommodation of a set of worlds in which the addressee stops while the light is not red. Crucially, such a set is not made available by the foregoing discourse. The discourse-salient *stopping worlds* are modally subordinate to (a subset of) the *red light* worlds. That is, we predict that all *stopping* worlds are *red light* worlds in this discourse. We correctly predict then, that $\{w' \mid w' \in \textit{STOP} \setminus \textit{RED.LIGHT}\}$ cannot serve as an antecedent proposition to *otherwise*, explaining the infelicity of 51.[35]

Finally, consider an example with several conjoined clauses. In (54), either all three conjoined clauses or the *final* conjunct can be accommodated as an antecedent proposition to *otherwise*. The other conjuncts are not accessible antecedents for *otherwise* in this context on their own. Again, this is precisely what is predicted from a modal subordination account.

[34] Kruijff-Korbayová and Webber do not consider explicitly the infelicity of 51 (although see their discussion on p. 78).

[35] Compare 51 with the vastly improved 52, where the relevant *if*-clause receives focus and associates with *only*.

(52) (Only) if the light is RED, stop; *otherwise* you'll get rear-ended.

The felicity of 52 follows naturally from a standard semantics for *only*, where *only* is taken to assert the negation of alternatives to its prejacent (see Horn 1969:99). As shown by Barker (1993), McCawley (1974) and von Fintel (1994, 1997), the truth-conditional content of *only if* can be derived compositionally (*i.e.* as a function of the standard semantics of *only* and *if*), where the assertive content of q, *only if* p is modeled as $\neg p(w) \rightarrow \neg q(w)$ (that is, q holds in no worlds other than those in which p does).

(53) *Presuppositional and assertive components of 52:*
Only if the light is RED, stop; *otherwise* you'll get rear-ended.
Presupposes: If the light is red, you stop.
Asserts: If the light is {yellow | green}, you don't stop. If you do stop, you get rear-ended.

(54) You should have a snack, chill out for a bit, and then you should go to the gym, *otherwise* you'll feel bad later on.

In sum, we have shown that each of the three *Red Light* sentences investigated here can be represented by the *otherwise* condition (i.e. $K_i \ominus K_j$) given in 34 (formalized in DRL terms in the appendix as 88). As discussed at length, the choice of antecedent for *otherwise* varies between the examples, and cannot be determined from the preceding syntax alone. Instead, we have argued that the proposition which is accommodated as the antecedent to *otherwise* is selected from a set of propositions made salient by the pronounced antecedent K_i: those that are accessible from K_i and which monotonically restrict the context set/the domain of a modal operator.[36]

The consequent clause plays a crucial role in the reasoning about which proposition among this set represents the set of worlds under consideration in the evaluation of an *otherwise*-sentence. We discuss this reasoning in detail in section 1.3.3.

1.3.3 *Otherwise* as a discourse anaphor

As the preceding sections make clear, there is often more than one possible choice for the antecedent proposition of *otherwise*. How is this antecedent chosen, then? We propose that the antecedent proposition which *otherwise* operates on is calculated pragmatically from the prior discourse and the nature of the consequent clause.[37,38]

By deploying the information structure notions developed in Carlson (1983) and Roberts (1996/2012), we can conceptualize of *otherwise* as representing a DISCOURSE MOVE (in effect, a stage in a given discourse), which adds to the QUESTION UNDER DISCUSSION in a given discourse context $\mathcal{D}$.

(56) *Two useful definitions:*

a. The **common ground** is a set of mutually assumed background information. The cg is often modeled as a set of propositions, i.e. a set of sets of possible worlds (e.g. Stalnaker 1979 *et seq.*).

b. The **QuD** is a partially structured set of questions which discourse participants are mutually committed to resolving at a given point in time. It is often modeled as a stack, consisting of ordered subsets of accepted question moves, the answers to which are not entailed by the cg (*i.e.*, a set of "open" questions in the discourse at a given time.)

[36] An anonymous reviewer queries the applicability of this proposal to relevance/biscuit-type conditionals such as (a) below. We believe that the analysis defended here can be reconciled with previous accounts of biscuit conditionals (e.g. Franke 2007, Siegel 2006 a.o.). Very roughly, a sentence of the type (a) below can be paraphrased as (b) — that is, the negation of the entire biscuit conditional furnishes an antecedent to *otherwise*.

(55) a. *If you're hungry, there's pizza in the fridge.* Otherwise*, there are biscuits on the sideboard.*

b. (You are hungry $\wedge\neg$ RELEVANT (Pizza in fridge)) $\Rightarrow$ RELEVANT(biscuits on sideboard)

[37] This claim bears some similarity to the notion of an "anaphorically-derived contextual parameter" that features in the analysis of Webber et al. (2001:14).

[38] Relatedly, Corblin (2002) notes the possibility of *negative accommodation* without *otherwise* in *I didn't buy the car. I wouldn't have known where to put it (otherwise)* and *I should have accepted. I wouldn't have been fired.* (our translations: 256, 258).

With these concepts, we have a means of representing the 'flow' of information and changes in the interlocutors' information states over time. We take a sentence of the form p *otherwise* q to consist of (at least) three discourse moves. We propose that *otherwise* represents a discourse "setup" move with the effect of adding to the QUD.

(57) *Proposal: the pragmatics of* otherwise
Otherwise represents a discourse "setup" move with the effect of adding to the QUD stack a question about the COMPLEMENT of a set of worlds calculated on the basis of the utterance preceding *otherwise*.

The importance of this pragmatic aspect of our analysis is illustrated for example (58) below.

(58) [*You must eat*]$_{m_i}$, **otherwise**$_{m_j}$ [*you won't grow!*]$_{m_k}$

m_i This is the pronounced antecedent. It represents a modalized assertion: the addressee eats in all worlds in some unspecified conversational background (here, likely some teleological ordering source containing the subject's goals or some set of nutritional standards — e.g. $\underset{tel(w)}{\text{BEST}}\big(\cap \underset{\text{CIRC}}{m(w)}\big)$

$$\forall w' \big[w' \in \underset{tel(w)}{\text{BEST}}\big(\cap \underset{\text{CIRC}}{m(w)}\big) \rightarrow \text{EAT}(\textit{Addressee})(w')\big]$$

m_j *otherwise* represents an instruction to consider the COMPLEMENT of some set of worlds accessible from the pronounced antecedent. This can be thought of as signaling the addition of a question to the QUD stack of the form:

$$\lambda p\,.\ \text{what if we are in some } w \in \overline{\boldsymbol{p}}\,?$$

(As above, the $\overline{\text{overline notation}}$ denotes a function that maps a set of worlds to its complement.) In this case, a plausible candidate is: what if we are in a world in which the addressee doesn't eat?

m_k The consequent clause to *otherwise* is interpreted as proffering a (partial) answer to the current QUD by asserting that – as far as the speaker is concerned – the addressee won't grow in the set of worlds made available to *otherwise* — here, the complement of the set of worlds that best adhere to some set of goals/nutritional standards in w.

$$\forall w'' \big[w'' \in \underset{o(w)}{\text{BEST}}\big(\cap \underset{\text{CIRC}}{m(w)} \cup \overline{\text{EAT}(w'')}\big)\Box\neg\text{GROW}(w'')\big]$$

As we know, the process of establishing the context set for a given *otherwise* sentence is underdetermined by the syntax of the sentence.[39] In the context of the *Red Light* sentences, the discourse moves m_i, m_j, m_k in the pronounced antecedent are identical. However, the consequent clauses of 59a, 59b and 59c contribute the moves m_a, m_b, and m_c, respectively.

[39] In our example in (58), an alternative QUD raised by *otherwise* could be "what if we are in a world in which the addressee doesn't have to eat?" However, this potential question can be dismissed on the grounds that the consequent "you won't grow" isn't a plausible answer to this question. We discuss this issue at length next.

The fact that these moves are different suggests that a different question move can be raised (added to the QUD) by *otherwise* in each case.

(59) *Three different discourse moves based on the same antecedent:*

a. [*If the light is red,*]$_{m_i}$[*stop*;]$_{m_j}$ *otherwise*$_{m_k}$ [*there will be chaos.*]$_{m_a}$

b. [*If the light is red,*]$_{m_i}$[*stop*;]$_{m_j}$ *otherwise*$_{m_k}$ [*keep going.*]$_{m_b}$

c. [*If the light is red,*]$_{m_i}$[*stop*;]$_{m_j}$ *otherwise*$_{m_k}$ [*you'll get a ticket.*]$_{m_c}$

We provide an Information-Structure based analysis for this state of affairs. We spell this out in 60–62 below:

(60) **An information-structural approach to the *Red Light* puzzle**

m_i The *if*-antecedent temporarily constrains the context set (Roberts 1989:687). This might be thought of as adding a question to the QUD stack of the form:

$$\text{what if we are in}\{w' \mid w' \in \underset{o(w)}{\text{BEST}}\Big(\bigcap\big(m(w) \cup \text{RED.LIGHT}\big)\Big)\}?$$

m_j Imperative *stop* represents an answer to QUD(m_i). As with the antecedent in 58, we treat it as a modalized proposition (again with some conversational background f)[40] which further restricts the domain established by m_i.

$$\forall w''\big[\ w'' \in \underset{deo(w)}{\text{BEST}}\big(\bigcap\limits_{\text{CIRC}} m(w) \cup \text{RED.LIGHT}\big) \rightarrow w'' \in \text{STOP}(\textit{Addressee})\big]$$

Per our proposal, *otherwise* marks the addition of a question to the QUD stack which considers what would happen if we were in the *complement* to a proposition accessible from the pronounced antecedent:

(61) *The* otherwise *discourse move:*

m_k *Otherwise* represents an instruction to consider the **complement** of some set of worlds accessible from the pronounced antecedent.

$$\lambda p\,.\,\text{what if we are in some } w \in \overline{\boldsymbol{p}}\,?$$

m_i and m_j have both introduced sets of worlds constraining the context set: each of these sets of worlds represents a candidate that *otherwise* can be anaphoric upon. Moreover, as we have seen in previous sections, the *modal base* of a modalized proposition is also an accessible set of worlds that can be questioned. The Addressee is thus required to *infer* which of these multiple restrictions *otherwise* is anaphoric upon (*i.e.*, its antecedent), based on the content of the consequent. We dub this the *jeopardy! effect*: the addressee is provided with the consequent (=the answer) and must compute (*sc.* accommodate) the correct antecedent (=question) based on it:[41]

[40] See Portner (2007) a.o. for a modal treatment of imperative sentences.

[41] This bears some similarity to the account of discourse-anaphoric uses of *then* laid out in **?**: "*then* is a discourse marker that signals that the utterance of the embedded clause is in some sense motivated by [and therefore is **anaphoric upon**] the preceding discourse move" (380, 383).

(62) *The JEOPARDY! effect*

m_a *there will be chaos* is interpreted as an answer to *what if we are in* **the complement** of the modal base? (those worlds in which the road rules of in w don't hold)

$$\forall w''\left[w'' \in \overline{\textsc{best}(\cap m(w))}\,\Box\,\textsc{keep.going}(w'')\right]$$

m_b *keep going* is interpreted as an answer to *what if we are in* **the complement** of RED.LIGHT (relative to the modal base)?

$$\forall w''\left[w'' \in \textsc{best}(\cap(m(w) \cup \overline{\textsc{red.light}}))\,\Box\,\textsc{keep.going}(w'')\right]$$

m_c *get a ticket* is interpreted as an answer to *what if we are in* RED.LIGHT $\setminus$ STOP? (more accurately, the complement of STOP *relative* to the conditional modal base $m^+(w)$)

$$\forall w''\left[w'' \in \textsc{best}(\cap(m(w) \cup \textsc{red.light} \cup \overline{\textsc{stop}}))\,\Box\,\textsc{get.ticket}(w'')\right]$$

Our claim, then, is that computing the antecedent of *otherwise* is a pragmatic process, subject to reasoning by the addressee and depending on the given context in which the sentence is uttered.[42] This follows from the pragmatic stipulation that, in a discourse, assertions represent 'at least partial answers [...] to the question under discussion at the time of utterance' (Roberts 2012:20–21, see also Roberts 2004 on the "domain goals" of discourse participants and how these can direct participants' "strategies of inquiry.")[43] Broadly, the discourse contribution of *otherwise* can be understood as representing a "set-up move": it signals to the addressee that its consequent is to be understood as a modal claim, relativized to the complement of a set of worlds accessible from the pronounced antecedent.

1.4 NON-EMPTINESS and possibility modals

Given that, on the analysis presented in the foregoing section, *otherwise* requires reference to a set of "eliminated worlds"—the complement of some set of worlds introduced by the antecedent clause—it follows that a sentence of the form p *otherwise* q will be uninterpretable in discourses in which **no** worlds have been eliminated (i.e. where $\overline{p'} = \varnothing$). This principle is formulated in 63, and reflects the *non-emptiness* requirement we observed in section 1.2.2.

(63) *EXCLUSION: a felicity condition for* otherwise
The interpretation of *otherwise* α depends on the retrieval of some discourse move whose function was to eliminate a (nonempty) set of worlds β from consideration (i.e., from the context set).
Otherwise α predicates α of $\overline{\beta}$.

[42] This makes predictions for online sentence processing — for example, that a given reading could be primed or ruled out by supporting contexts. We leave this for future work.

[43] In fact, this effectively serves as a reformulation and elaboration of Grice's maxim of Relation, adapted for an information-structural framework.

In this section we show two consequences of this criterion for the interpretation of *otherwise* in modalized sentences.

1.4.1 Unambiguous scope

A sentence like *Sam may not be a doctor* is ambiguous between circumstantial and epistemic readings for the modal. With this in mind, observe the contrast between 64/65 and 66 below, which we argue further demonstrates the interpretive constraints that *otherwise* is subject to — namely, that it must be able to refer to a non-empty complement set of worlds, computed on the basis of its antecedent and other components of the context. To illustrate this, consider the three contexts provided for these examples. These are designed to support a circumstantial possibility reading 64, and epistemic necessity and possibility readings 65–66, in the context of an *otherwise* statement:

(64) CONTEXT. Sam got horrible grades in school and is very clumsy

a. She may not be a doctor, *otherwise*... $\neg \gg \Diamond_{\text{circ}}$

b. ≈ If she were (to become) a doctor... ...she might kill someone.

(65) CONTEXT. Sam works in a hospital and wears a white coat; I'm unsure exactly what it is that she does, but upon soliciting her opinion on my shoulder pain, she shrugs and walks away.

a. She must not be a doctor, *otherwise*... $\Box_{\text{epist}} \gg \neg$

b. ≈ If she were a doctor... ...she'd know what to do about my pain.

(66) CONTEXT. Sam works in a hospital and wears a white coat; I'm unsure what exactly it is that she does.

a. She may not be a doctor, *otherwise*... $*\Diamond_{\text{epist}} \gg \neg$

b. INTENDED ≈ If she is a doctor... $^{??}$...she's probably a surgeon.

Observe that, while examples 64 and 65 are acceptable, 66 is not. A crucial difference between the circumstantial 64 and epistemic 66 readings of the antecedent is the scope relation between the possibility modal and the negative operator. Just as for example 17 discussed in section 1.2.2 above, *otherwise* is only licit if it can predicate into a non-empty set of worlds. In the $\neg \gg \Diamond$ case (as in the $\Box \gg \neg$ case) we can successfully achieve this result. But in the $\Diamond \gg \neg$ case, where there is no set of worlds eliminated, *otherwise* is unavailable. That is, whether or not Sam is a doctor is not determined by the antecedent clause in 66. As a result of the infelicity of *otherwise* in these $\Diamond \gg \neg$ contexts (owing to the EXCLUSION criterion), epistemic readings of *may* are ruled out; only the (narrow scoping) circumstantial reading—as in 64—is available. Finally, example 65 as a control, to show us that, in general, an epistemic modal is able to scope above negation and hence that cannot be the source of the infelicity of 66.

1.4.2 Epistemic strengthening

A second, related result concerns so-called 'weak necessity' readings of possibility modals (Rubinstein 2012, von Fintel and Iatridou 2008).

The modals *ought* and *should* have been described as encoding "weak" necessity, distinguishing them from other modal necessity expressions (e.g. *have to* and *must*.) Two examples demonstrating the relation between weak and strong necessities from von Fintel and Iatridou (2008:117) are provided below.

(67) *Weak and strong necessity:*

a. You *ought to* do the dishes but you don't *have to*.

b. #You *must* do the dishes but you don't *have to*

(68) a. You *ought to* wash your hands – in fact, you *have to*.

b. ?You *have to* wash your hands – in fact, you *ought to*.

Additionally, as with other modals, *ought* appears to admit of ambiguity between epistemic and circumstantial (e.g. deontic) readings, as shown in 69.[44]

(69) *Weak necessity and modal flavors:*
Morris *ought to* be in his office. (von Fintel and Iatridou 2008:116)

In view of the co-occurence constraints on epistemic possibility modals with *otherwise*, compare the two sentences (both judged as acceptable) in 70:

(70) *A felicitous epistemic possibility modal with* otherwise*:*

a. She *must* be sick, otherwise she'd be here.

b. She *might* be sick, otherwise she'd be here.

The domain restriction in 70a proceeds similarly to the examples described in the previous section. That is, the antecedent has eliminated NON-SICK worlds from the epistemic context set. The *otherwise* clause is then predicated of these NON-SICK worlds that best conform to the speaker's knowledge state.

However, example 70b presents a puzzle: the use of a possibility modal suggests that as far as the speaker is concerned, the subject may or may not be sick. That is, NON-SICK worlds are *not* eliminated from the context set. Consequently, the felicity condition for *otherwise* as laid out in 63 is not met: unlike in 70a, the NON-SICK worlds cannot be accommodated as a restrictor to *otherwise*. We would therefore predict 70b to be ungrammatical, contrary to the facts.

This problem is repaired here by *strengthening* the meaning of *might*, so that it is interpreted as excluding a set of possible worlds (that is, requiring that it function as a universal quantifier: a hallmark of necessity modals). While the intended interpretation of 70b is weaker than that of its counterpart in 70a, it can still be understood as quantifying universally over possible worlds, albeit over a more restricted set. Following von Fintel and Iatridou (2008:116, fn. 11), 'while strong necessity modals say the prejacent is true in all of the

[44] Cf. Yalcin (2016) for a dissenting view, namely the claim that epistemic modality cannot be 'sensitive to normality orderings' (239) and that *ought* and *should* don't actually admit of a true epistemic reading.

favored worlds, weak necessity says that it is true in all the very best (by some additional measure) among the favored worlds.' With respect to the epistemic domain specifically, the difference could be understood as the difference between relativizing the prejacent to "hard and fast evidence" and "unreliable assumptions about the normal course of events."[45] Consequently, we propose the paraphrases below:

(72) *With* otherwise *the possibility modal is strengthened to weak necessity:*

a. She *must* be sick, otherwise she'd be here.
≈ *In all worlds consistent with what I know,*
if she is not sick, she'd be here.

b. She *might* be sick, otherwise she'd be here.
≈ *In all worlds consistent with my perception of her general behavior*,
if she is not sick, she'd be here.

The finding that *might/may* — generally understood as encoding modal possibility — are in these contexts apparently encoding weak necessity suggests that the felicity conditions of *otherwise coerce* a non-canonical interpretation of these modals.[46] This result follows from our proposal in section 1.3.2 (and the exclusion criterion in 63), that some non-empty set of worlds must be available for *otherwise* to predicate of.

1.5 Intra-sentential *otherwise* and complement anaphora

So far, the data we have focused on in this paper have comprised uses of *otherwise* that appear to signal a relation between clauses. We have claimed that, in these cases, *otherwise* adds a question of the form *what if the antecedent proposition doesn't hold?* to the QUD stack. Nevertheless, as shown in section **??**, intra-sentential uses of *otherwise* — namely, those which coordinate smaller structures — are also available. In this section, we briefly show how our analysis might be extended to account for such uses. We then relate our analysis to the phenomenon of *complement anaphora*, which has also benefited from an analysis within a dynamic semantic framework.

1.5.1 *Otherwise* with donkey anaphors

A key advantage of DRT is in providing an analysis of so-called Donkey Sentences, such as in (73):

[45] Von Fintel and Iatridou (2008) and Rubinstein (2012) model weak necessity by appealing to at least one additional ("secondary") ordering source which "refines the ranking of worlds" — weak necessity modals predicate their prejacent of "all the very best" (according to some set of criteria) of the worlds in the modal base that are already ranked best. In the current case, the secondary ordering source might be described as some species of *stereotypical* conversational background o_2 that includes propositions about the speaker's perception of the subject's disposition/general conduct. Adopting this analysis, the accommodated antecedent for 70b is:

(71) $\overline{\alpha} = \left\{ w' \mid w' \in \underset{o_2(w)}{\text{BEST}} \left(\underset{o_1(w)}{\text{BEST}} \left(\cap \underset{\text{EPIST}}{} (m(w) \cup \overline{\text{SICK}}) \right) \right) \right\}$

[46] We leave a proper analysis of the mechanism by which this "strengthening" occurs to future research, although, given that *might* is a "weak" scalemate of *must*, it follows that—in contexts which require a necessity interpretation—the interpretation of *might* would be "weak" relative to *must*.

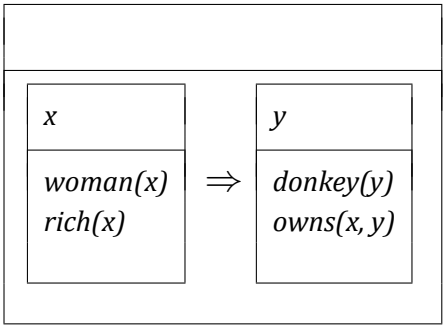
(73) *Donkey anaphora:*

a. If a woman is rich, she owns a donkey.

b. If a dog is hungry, Pedro might feed it. =31

Such sentences were famously used as a counter-examples to Montague's formal analysis of quantification in natural language (**?**), as they defy an analysis in first-order predicate logic.[47] As we saw in section 1.3.1, DRT is able to provide a natural account, treating indefinites as variables rather than existential quantifiers (see Kamp 1981, Heim 1982). This is exemplified again in (74):

(74)



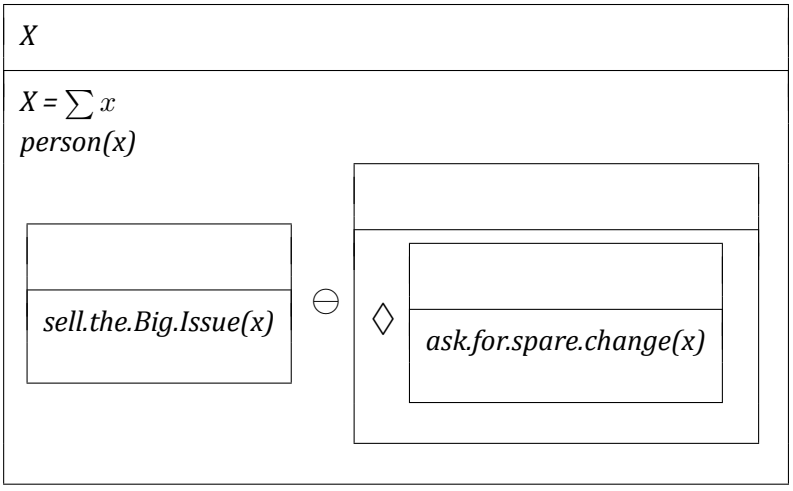
One payoff of the approaches espoused by these authors is the conception of universal expressions as complex conditions of the form $K_i \rightarrow K_j$, where K_i and K_j are sub-DRSs representing the restriction and the scope of the quantified statement, respectively (Roberts 1989:693-4).

Appealing to these same notions, we are able to naturally account for some intra-sentential uses of *otherwise*, as in (75) from Webber et al. 2001:7, repeated here for convenience:

(75) *Intra-sentential* otherwise*:*

a. Every person selling "The Big Issue" might *otherwise* be asking for spare change. =(12a)

b.



c. ≈ In all worlds in which a person x isn't selling the Big Issue, it's possible that the person x is asking for spare change.

[47] A formula can be given, but only if the indefinite is translated using a universal quantifier — an arguably undesirable result.

For Webber et al. 2001, example (75) requires the use of E-type pronouns. It thus receives a different analysis than inter-sentential uses such as the *Red Light* sentences. Our account, on the hand, doesn't resort to any additional assumptions, and does not predict any distinction between such examples. We take this to be another advantage of our approach here.

1.5.2 "Intrapredicative" *otherwise*

Expanding on examples such as (75), in this section we investigate intra-sentential uses of *otherwise* (termed *intra-prédicative* by Flament-Boistrancourt 2011). We show how such cases can be united with the analysis presented above. The examples in (76) illustrate several relevant cases:

(76) *"Intrapredicative"* otherwise*:*

a. I started meditating to find a bit of stillness in an *otherwise* hectic life.

b. The income they earn from [tea production] is likely to be the only source of cash to supplement their *otherwise* subsistence economy.

(OED)

c. Amelia behaved well *otherwise*. (Flament-Boistrancourt 2011)

d. She's blonde. *Otherwise* she totally looks like her dad.

(Inkova-Manzotti 2002:124)

Observe that all of these uses are united insofar as they rely on processes of **association** (contextual retrieval of some domain set) and the **exclusion** of the complement of the prejacent from that set (see Webber et al. 2001).

For the intrapredicative uses shown here, then, *otherwise* can be understood to denote a relation that holds between PROPERTIES ($P, Q \in \mathcal{D}_{\langle s,\langle e,t\rangle\rangle}$). Namely, where P is some accommodated property, *otherwise* Q can be understood as a property where if P didn't hold of x in w, then Q would. Building on our proposal in section 1.3, then, we would allow the (complement) set of worlds predicated of by *otherwise* to be constructed not only by considering a proposition (or set of propositions) and its negation, but also by considering a property (or set of properties) and *its* negation. In both cases, *otherwise* is to be understood to **quantify over intensions**. We leave the precise formulation of this extension to our analysis to future research.

1.5.3 Complement anaphora

Finally, we point out similarities between our analysis of *otherwise* and the phenomenon of complement anaphora, exemplified in (77) (Evans 1977, 1980, Nouwen 2003).[48] Complement anaphora occurs in sentences where an anaphor appears to refer to the *complement* of a set of individuals introduced earlier in the discourse:

[48]Some speakers struggle with the complement anaphora reading. The existence of complement anaphora was first extensively studied in a series of psycholinguistic experiments (Moxey and Sanford 1986, Sanford et al. 1994). These authors identify a small set of proportional determiners, including *few, few, very few, not many*, and *hardly any*, as allowing reference to the *complement* of a set of individuals introduced earlier in the discourse.

(77) *Complement anaphora:*
Few congressmen admire Kennedy.

a. *They* are (all) very junior. $A \cap B$

b. *They* think he's incompetent. $A \cap \overline{B}$

Moreover, while this has not (to our knowledge) been previously noted in the literature, we find similar effects in the temporal domain:[49]

(78) *Complement anaphora in the temporal domain:*
Senators *rarely* vote their conscience. They do what the Party tells them to.

Building on Kibble 1997, Nouwen (2003) develops a dynamic semantic analysis of complement anaphora, where reference to a complement set of individuals arises out of pragmatic constraints, key among them is the Non-Emptiness constraint.[50]

(79) Non-Emptiness:
As the antecedent of an expression do not choose a set which is potentially empty, except when this set is the reference set of a quantificational sentence.

Parallel to this proposal, we have argued that *otherwise* picks out a complement set of worlds, and is subject to the exclusion felicity condition, 63. We take *otherwise* to lexically specify complement set reference, which is therefore not subject to the same pragmatic constraints as complement anaphora. We take (80) to be a felicitous paraphrase of a sentence such as 77b:

(80) *Complement anaphora with* otherwise*:*
Very few congressmen admire Kennedy. *Otherwise* they (all) think he's incompetent.

Otherwise encodes the instruction to consider a complement set of worlds as part of its semantics. As a consequence, *otherwise* sentences are not marginal and are not subject to the same distributional restrictions as complement anaphora. This observation is similar to an observation Nouwen (2003:109ff) makes about the phrase 'the others':

(81) *Complement anaphora with* 'the others'*:*
Very few congressmen admire Kennedy. *The others* (all) think he's incompetent.

As Nouwen notes, *the others* refers to the *maximal set* of individuals which forms the complement to the set introduced in the antecedent sentence. This use is felicitous is cases where this complement set is necessarily non-empty. Again, the resulting sentence, like in our *otherwise* examples, is then predicated of *all* individuals in this set.[51] See also Corblin

[49] Such effects may be predicted by the discussion of 'generalized discourse subordination' effects of temporal quantifiers (Roberts 1989:716ff, Corblin 1994:8).

[50] See Corblin 1986 and Geurts 1997 for an alternative account whereby sentences described as involving complement anaphora in fact make reference to the *maximal set*, and not truly to the complement set. Nouwen 2003 provides several arguments against this *pseudo-reference* view.

[51] Ezra Keshet (pers. comm.) points out a related similarity between *the others* and *otherwise*. *The others* can pick up the members of the restrictor set *not* including the current individuals being quantified over:

(82) Few/Most boys ganged up on the others.
(cf. #Few/Most boys ganged up on them)

(1994, 2002) for a discussion of *relativisations négatives* ("negative accommodation") in a modal subordination framework, which he takes as clear evidence of the need to appeal to some pragamtic phenomenon.[52]

1.6 Conclusion & further work

In this paper, we developed a formal semantic/pragmatic analysis of the interpretation and meaning contribution of the English discourse anaphor *otherwise*. The analysis was couched within the theory of dynamic semantics, and in particular relied on the notion of modal subordination for predicting the distribution of *otherwise* in English sentences.

We proposed that *otherwise* introduces a discourse move (in the sense of Roberts 2012) into the conversation, which encodes an instruction to consider the *complement* of a set of worlds introduced in the clause preceding *otherwise*. That is, p *otherwise* q asserts that proposition p holds (modulo assertoric norms), and that in the case that p' — some component proposition of p — doesn't hold, then some alternative proposition q must be true: $(p) \wedge (\neg p' \Box q)$. We detailed the intensional/modal-dependent property of *otherwise*, its asymmetric conjunctive behavior, and the *weakening* process affecting declarative antecedents in section 1.2.

Following Webber et al. (2001) and other authors, we took as key the observation that the identity of the antecedent clause to *otherwise* — p' in the paraphrase in the preceding paragraph — cannot be determined by the syntax alone, although it is informed and restricted by it. An analysis that makes use of the notion of modal subordination (Roberts 1989, 1990, 2020) captures these facts; the sets of propositions that can be accommodated to restrict the quantificational domain of *otherwise* are those which monotonically restrict the context set in the pronounced antecedent p.

Additionally, we argued that we must make crucial reference to the current information structure, in particular to the current Question under Discussion, in determining which of these accessible sets will be accommodated and serve as the antecedent proposition to *otherwise*, p'. We dubbed this phenomenon *the Jeopardy effect*: the nature of the *consequent* to *otherwise* plays a crucial role in determining its antecedent.

An interesting consequence of our analysis is that *otherwise* imposes a restriction on the nature of its arguments; namely the NON-EMPTINESS of that complement set into which it predicates. In section 1.2.2, we empirically motivated this felicity condition; section 1.4 detailed a number of its consequences.

Finally, we briefly showed how this dynamic account can be extended to cases of reference to individuals, and in particular how it can be related to the phenomenon of *complement anaphora*.

In such configurations, *otherwise* is also available. In the examples below, *otherwise* picks up the worlds other than the winning or cheating worlds.

(83) a. If you win, you'll be happier than (you would have been) *otherwise*.

b. If you cheat, you'll always wonder if you could have succeeded *otherwise*.

This point is also addressed by Webber et al. (2001:8).

[52]For Corblin (2002:260) the solution is found in relations from Rhetorical Structure Theory like EVIDENCE and JUSTIFY (apud Mann and Thompson 1988).

1.7 APPENDIX
Modal subordination with *otherwise* – the formal mechanics

In this appendix, we provide further detail about the "discourse representation language" that formalizes the structures (and the satisfaction conditions for $\ominus$) presented in the paper. Further, we show a complete derivation for an "*otherwise*-sentence" as a "proof-of-concept" for our analysis.

As described in §1.3.1, formally a DRS K is a pair $\langle X_K, C_K \rangle$. X_K represents K's *local domain* – a finite set of variables that are assigned to discourse objects at a given discourse stage. Consequently, each DRS can be thought of as introducing participants (represented by variables over the domain of individuals) as well as variables over eventualities and times (per Kamp's (1979, **?**) treatment of temporal/aspectual phenomena, see also Partee 1984).

C is a finite set of conditions that eventually determine the truth value of a given proposition. An atomic condition is of the form $P(x_{i_1}...x_{i_n})$ (where P is an n-place predicate). Conditions are closed under the operations $\neg, \bigvee, \Rightarrow, \Box, \Diamond$.

Crucially, Roberts (1989:713) also defines the notion of an "accessible domain" A_K – a superset of the local domain for any given K. Accessibility is a partial order that obtains over DRSs such that for any K:

(84) *Accessibility relations for operators and DRSs in DRT:*

$$\begin{array}{rl} K_i \vee K_j \in C_K & \rightarrow K \leqslant K_i \,;\, K_j \\ \neg K_i \in C_K & \rightarrow K \leqslant K_i \\ \left.\begin{array}{r} K_i \Rightarrow K_j \in C_K \\ K_i \,\Box\, K_j \in C_K \\ K_i \,\Diamond\, K_j \in C_K \end{array}\right\} & \rightarrow K \leqslant K_i \leqslant K_j \end{array}$$

The **accessible domain** of a given DRS, then, is given by the set union of all accessible DRSs' local domains: $A_{K_i} = \bigcup_{K \leqslant K_i} X_K$. As pointed out in §1.3.1, this relation is graphically represented in the box diagrams.

One primary payoff of this conceptualization is an epiphenomenal notion of MODAL SUBORDINATION (Roberts 1989 *et seq.*), where the interpretation of subordinate DRSs is dependent on access to objects introduced by (*sc.*, in the local domains of) those DRSs to which they are subordinate:

(85) MODAL SUBORDINATION is a phenomenon wherein the interpretation of a clause α is taken to involve a modal operator whose force is relativized to some set β of contextually given propositions. (Roberts 1989:718)

In 34, we defined the *otherwise* operator $\ominus$ (and hence the condition $K_i \ominus K_j$) to represent the contribution of *otherwise*. In effect, $\ominus$ can be expressed in terms of other operators (i.e. $\wedge, \neg, \Box$). We repeat this proposal in 86.

(86) *Proposal: A dynamic semantics for* otherwise

$K_i \ominus K_j \Longleftrightarrow (K_i) \wedge ((\neg K_{i_{\text{sub}}}) \Box K_j)$

In words: $K_i \ominus K_j$ is satisfiable iff both the conditions in K_i and the condition $((\neg K_{i_{\text{sub}}}) \square K_j)$ are satisfiable.

Consequently, $K_i \ominus K_j \in C_K \rightarrow K \leqslant K_i \leqslant K_j$. As shown in §1.3.2.3, Roberts' accessibility relation between DRSs can successfully predict the range of possible antecedents for *otherwise*. The DRSs that are available to (be accommodated to) serve as $K_{i_{\text{sub}}}$ are those that are embedded within K_i but *not* modally subordinate to other DRSs for their interpretation.

In her extension to the discourse representation language, Roberts (1989:714-5) provides a recursive definition of truth (*i.e.* verification in a model $\mathcal{M}$) for DRSs. Given in 87, effectively, truth in a model is defined for a DRS K with respect to a world if there is some assignment function that satisfies all of the conditions in K in that world (recalling that K itself is a pair including a condition set C_K.)

(87) $\langle w, f\rangle \vDash_{\mathcal{M}} K \leftrightarrow \forall c \in C_K\big(\langle w, f\rangle \Vdash_{\mathcal{M}} c\big)$
A DRS K is verified (or "embedded") in a model $(\vDash_{\mathcal{M}})$ relative to a world w and assignment f iff all the conditions in K are satisfied $(\Vdash)$ by w and f.

Roberts spells out a semantics for the satisfaction of all (atomic and non-atomic) conditions in C_K. Extending this, we can define a semantics for the $\ominus$ operator. The satisfaction conditions for $K_i \ominus K_j \in C_K$ are given in 88, where monotonically-growing assignment functions formally model the accessibility relation $\leqslant$ described above. Effectively, they ensure that any modally subordinate DRS will be able to refer to ("access") superordinate structures.

The formalism in 88 spells out the satisfaction conditions laid out in 86, assuming the notational conventions and adapting the proposals in Roberts (1989:714). It makes use of a function BEST which returns those worlds in a given set $m \subseteq \mathcal{W}$ (the *modal base*) which best conform to a given ordering source o (*i.e.*, contextually provided set of propositions inducing an order over m).[53] Note that the notation $f'_{\langle X\rangle}f$ reads: "f' is exactly the same as f except perhaps for the values it assigns to X" (implying that $f' \supseteq f$).[54]

(88) *DRL formalization of $\ominus$ satisfaction conditions:*
$\langle w, f\rangle \Vdash (K_i \underset{m,o}{\ominus} K_j) \leftrightarrow \exists g[g_{\langle x_{K_i}\rangle}f \wedge \langle w, g\rangle \vDash K_i \wedge$
$\forall w', g'\big[g'_{\langle x_{K_{i_{\text{sub}}}}\rangle}g \wedge w' \in \underset{o(w)}{\textbf{BEST}}\Big(\bigcap\big(m(w) \cup \{w'' \mid \langle w'', g'\rangle \vDash (\neg K_{i_{\text{sub}}})\}\big)\Big)$
$\rightarrow \exists g''[g''_{\langle x_{K_j}\rangle}g' \wedge \langle w', g''\rangle \vDash K_j]\big]$
In words: A world w and assignment f satisfy the condition $K_i \underset{m,o}{\ominus} K_j$ iff:

- There is some assignment g (identical to f except perhaps in the values it assigns to K_i) that satisfies K_i;
- If there is an assignment g' (identical to g except perhaps in the values it assigns to $\neg K_{i_{sub}}$) that verifies the **negation of $K_{i_{\text{sub}}}$** in world w' — a world in the modal base

[53] Described in fn 28, the deployment of a function BEST (given by authors elsewhere as ***max*** or ***O(pt)***) significantly compresses the formalism given in Roberts (1989: 714, which follows Kratzer 1981). Given that an ordering source o is modeled as a set of propositions which can induce an ordering $\leq_o$ 'relative to o, at least as good as' over a given set of worlds. Consequently, $\underset{o(w)}{\text{BEST}}\big(m(w)\big)$ returns $\{w' \in \bigcap m(w) \mid \forall u \in \bigcap m(w).w' \leq_{o(w)} u\}$ (see Hacquard 2006, Schwager 2006).

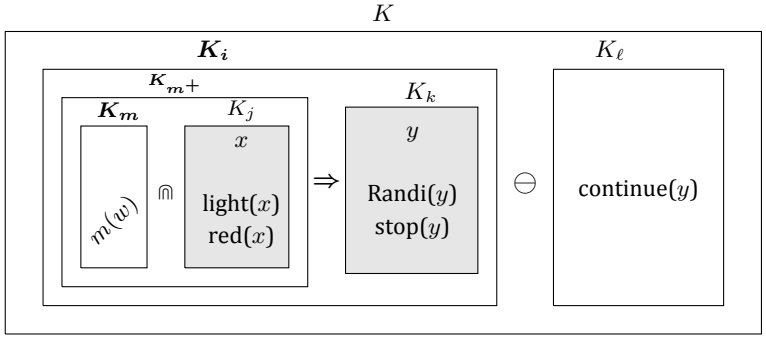
[54] In Roberts' formalism, $f_{\langle x\rangle}g \leftrightarrow \forall y\big(\neg(y \in X) \rightarrow f(y) = g(y)\big)$ (1989:714).

$m(w)$ best conforming to some ordering source $o(w)$ — then there will be an assignment g'' (identical to g' except perhaps in the values it assigns to K_j) that **verifies K_j** in w'.

A DRT representation for an adaptation of a (by now familiar) red light sentence is spelled out in 89. Alongside this representation, we list the set of satisfaction conditions introduced by the sentence.

(89) *A formal DRT analysis of an* otherwise *sentence:*
If the light is red, Randi will stop. *Otherwise* she'll continue straight.

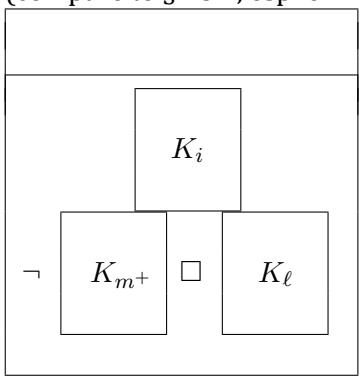
a. DRS making use of the $\ominus$-condition:



Where the following satisfaction conditions hold:

- $C_K = \{K_i \underset{m,o}{\ominus} K_\ell\}$
- $C_{K_i} = \{K_j \underset{m,o}{\Box} K_k\} = \{K_{m^+} \Rightarrow K_k\}$
- $C_{K_j} = \{\text{light}(x),\ \text{red}(x)\}$
- $C_{K_k} = \{\text{Randi}(y), \text{stop}(y)\}$
- $C_{K_\ell} = \{\text{continue}(y)\}$
- $C_{K_m} = \{c \mid \langle w', f\rangle \Vdash c\}$ where $w' \in \underset{deo(w)}{\text{BEST}}\big(\cap \underset{\text{CIRC}}{m(w)}\big)$
- $C_{K_{m^+}} = \{K_m \Cap K_j\} = \{c \mid \langle w'', f\rangle \Vdash c\}$

b. DRS illustration spelling out accommodation of the antecedent proposition ($K_{i_{\text{sub}}}$) (compare to §1.3.2, esp. exx. 45 & 46):



With the satisfaction conditions we introduced above, we can construct the truth-conditions that will verify the matrix DRS K:

(90) *Satisfaction conditions for 88:*

a. Simplex conditions:
The DRSs K_j, K_k, K_ℓ all contain only atomic conditions.
Each of these DRSs is verified iff there is some world-assignment pair $\langle w, f\rangle$ which satisfies all of their respective conditions.

- $\langle w, f\rangle \vDash K_j \leftrightarrow \langle w, f\rangle \Vdash \text{red.light}(y) \leftrightarrow f(y) \in [\![\text{red.light}]\!]^w$
- $\langle w, f\rangle \vDash K_k \leftrightarrow \langle w, f\rangle \Vdash \text{Randi}(y) \wedge \text{stop}(y) \leftrightarrow f(y) \in [\![\text{Randi}]\!]^w \cap [\![\text{stop}]\!]^w$
- $\langle w, f\rangle \vDash K_\ell \leftrightarrow \langle w, f\rangle \Vdash \text{continue}(y) \leftrightarrow f(y) \in [\![\text{continue}]\!]^w$

b. The antecedent to *otherwise* C_{K_i}:
The antecedent K_i is verified iff some world-assignment pair $\langle w, f\rangle$ satisfies the (complex) condition $K_j \,\square\, K_k$:
$\langle w, f\rangle \Vdash (K_j \underset{m,o}{\square} K_k) \leftrightarrow$
$\forall w', g\big[g_{\langle x_{K_j}\rangle} f \wedge w' \in \underset{tel(w)}{\textsc{best}}\big(\bigcap \big(\underset{\textsc{circ}}{m}(w) \cup \{w'' \mid \langle w'', g\rangle \vDash K_j\}\big)\big) \rightarrow$
$\exists g''[g''_{\langle x_{K_k}\rangle} g \wedge \langle w', g''\rangle \vDash K_k]\big]$

That is: $\langle w, f\rangle \vDash K_i$ iff for all w' in a circumstantial modal base $\underset{\textsc{circ}}{m}(w)$ that best conform to a teleological ordering source $o_{tel}(w)$: if there is some assignment g' that verifies K_j in w', then there is some assignment g'' that verifies K_k in w'.

c. The matrix condition C_K:
A world-assignment pair $\langle w, f\rangle$ verifies the entire DRS K iff it satisfies the (complex) condition $K_i \ominus K_\ell$:
$\langle w, f\rangle \Vdash (K_i \underset{m',o'}{\ominus} K_\ell) \leftrightarrow \exists g[g_{\langle x_{K_i}\rangle} f \wedge \langle w, g\rangle \vDash K_i] \wedge$
$\forall w', g'[g'_{\langle x_{K_i}\rangle} f \wedge w' \in \underset{tel(w)}{\textsc{best}}\Big(\bigcap \big(\underset{\textsc{circ}}{m'}(w) \cup \{w'' \mid \langle w'', g'\rangle \vDash (\neg K_{i_{\text{sub}}})\}\big)\Big) \rightarrow$
$\exists g''(g''_{\langle x_{K_\ell}\rangle} g' \wedge \langle w', g''\rangle \vDash K_\ell)]$

That is: $\langle w, f\rangle \vDash K$ iff:

- There is some assignment g that verifies K_i and
- If those worlds w' in a circumstantial modal base $\underset{\textsc{circ}}{m}(w)$ that best conform to a teleological ordering source (likely one that contains Randi's desires to both get where she needs to be and to be an upstanding road user) **verify the negation of K_{m^+}** (the antecedent to *otherwise*, accommodated due to the processes described in §1.3.3), then there'll be some assignment g'' that verifies K_ℓ in w'.

Notably, y is an unbound variable in its local DRS — however, because $K_i \leqslant K_\ell$, K_ℓ has access to the local domain of this DRS ($A_{K_\ell} \supseteq X_{K_i}$). As a result, the assignment function (g'' in 90c above) is able to assign to y an individual introduced earlier in the discourse (namely 'Randi'). We see, then, that our analysis is able to correctly model an *otherwise* statement, making crucial use of the notion of modal subordination and other tools that foreground discourse dynamics to provide the truth conditions for the sentence.

Chapter 2

The emergence of apprehensionality in Australian Kriol

2.1 Introduction

'Apprehensional' markers are a nuanced, cross-linguistically attested grammatical category, reported to encode epistemic possibility in addition to information about speakers' attitudes with respect to the (un)desirability of some eventuality. Taking the meaning of Australian Kriol particle *bambai* as an empirical testing ground, this paper provides a first semantic treatment of apprehensionality, informed by a diachronic observation (due toAngelo and Schultze-Berndt 2016 in which apprehensional readings emerge from erstwhile temporal frame adverbials that encode a relation of SUBSEQUENTIALITY between a discourse context and the eventuality described by the prejacent predicate.

Consider the contributions of *bambai* in the Australian Kriol sentence pair in (91):

(91) **Context:** I've invited a friend around to join for dinner. They reply:

a. **Subsequential reading of** bambai

yuwai! ***bambai*** *ai gaman jeya!*
yes! ***bambai*** 1s come there

'Yeah! I'll be right there!'

b. Apprehensional reading of bambai

najing, im rait! ***bambai*** *ai gaan binijim main wek!*
no 3s okay ***bambai*** 1s NEG.MOD finish 1s work

'No, that's okay! (If I did,) I mightn't (be able to) finish my work!'

[GT 20170316]

To be explicated in this chapter, while the reading of *bambai* in (91a) roughly translates to 'soon, in a minute', this reading is infelicitous in (91b), where *bambai* is a discourse anaphor which contributes a shade of apprehensional meaning (i.e. indicates that the Speaker's hypothetically joining for dinner may have the undesirable possible outcome of him not finishing his work.) This chapter is concerned with the emergence of APPREHENSIONAL readings of the temporal frame adverbial *bambai* in Australian Kriol. Beginning with a brief overview of "apprehensionality" as a linguistic category (§3.2), it: describes

the distribution of these two readings (synchronically, when do apprehensional readings "emerge" in context, (§ 2.2.3), considers how apprehensionality emerges out of so-called "subsequentiality" markers diachronically (§ 2.4), and proposes a unified meaning component for the two readings (§ 2.5).

2.1.1 Background

Having entered into their lexicons predominantly via the contact pidgin established in NSW in the late eighteenth century (Troy 1994), cognates of the English archaism *by-and-by* are found across the English-lexified contact languages of the South Pacific. Additionally, Clark (1979) describes *by-and-by* as a particularly broadly diffused feature of the *South Seas Jargon* that served as a predominantly English-lexified auxiliary means of communication between mariners of diverse ethnolinguistic backgrounds and South-Pacific islanders (21, cited in Harris 1986:262*ff* a.o.). The cognates across these contact languages have preserved the function of *by-and-by* as encoding some relationship of temporal subsequentiality between multiple eventualities.[1,2]

As shown in 91, Australian Kriol (hereafter Kriol *simpliciter*) has retained this function: in (92), *bambai* serves to encode a temporal relation between the two clauses: the lunch-making event occurs at some point in the (near) future of the speaker's father's trip to the shop: *bambai* might well be translated as 'then' or 'soon after'.

(92) *main dedi imin go la det shop ailibala* ***bambai*** *imin kambek bla*
my father 3S=PST go LOC the shop morning ***bambai*** 3S=PST come.back PURP
gugum dina bla melabat
cook dinner PURP 1P.EXCL

'My dad went to the shop this morning, **then** he came back to make lunch for us' [AJ 23022017]

In addition to the familiar 'subsequential' use provided in (92), *bambai* appears to have an additional, ostensibly distinct function as shown in (93) below.

(93) **Context:** It's noon and I have six hours of work after this phonecall. I tell my colleague:

ai=rra dringgi kofi ***bambai*** *mi gurrumuk la desk iya gin*
1S=IRR drink coffee *bambai* 1S fall.asleep LOC desk here EMPH

'I'd better have a coffee otherwise I might pass out right here on the desk'[GT 28052016]

In (93), the speaker asserts that if he doesn't consume coffee then he may subsequently fall asleep at his workplace. In view of this available reading, Angelo and Schultze-Berndt (2016) describe an 'apprehensive' use for Kriol *bambai* — a category that is encoded as a

[1] *baimbai* (sic) is described as a 'future tense marker' by Troy (1994:112,418,711) and (Harris 1986:268). Indeed it appears to be a general marker of futurity in the textual recordings of NSW pidgin that these authors collate, although still retains a clear syntactic function as a frame adverbial. Their description of *bambai* (along with *sun, dairekli, etc*) as tense marker is possibly due to the apparent lack of stable tense marking in the pidgins, although is likely used pretheoretically to refer to an operator that is associated with future temporal reference. This is discussed further in § **??** below

[2] See also Angelo and Schultze-Berndt 2016 for further review of cognates of *bambai* across other Pacific contact languages.

verbal inflection in many Australian languages and is taken to mark an 'undesirable possibility' (256). In this case, *bambai* is plainly not translatable as an adverbial of the 'soon'-type shown in (92). Rather, it fulfills the function of a discourse anaphor like 'otherwise', 'or else' or 'lest' (see also Webber et al. 2001, **?**).

This chapter proposes a diachronically-informed and unified semantics for Kriol *bambai*. It begins with section 2.2, which motivates the grammatical category of 'apprehensional epistemics' as described in typological literatures. Section 2.2.3 describes the function and distribution of Kriol *bambai*, both in its capacity as a subsequential temporal frame adverbial (§2.3.1) and its apparent apprehensional functions (§2.3.2). Section 2.5 proposes a unified semantics for *bambai* and discusses the grammaticalisation of apprehensional meaning while section 2.6 concludes.

2.2 Apprehensionality cross-linguistically

While descriptive literatures have described the appearance of morphology that encodes "apprehensional" meaning, very little work has approached the question of their semantics from a comparative perspective. Particles that encode negative speaker attitude with respect to some possible eventuality are attested widely across Australian, as well as Austronesian and Amazonian languages (Angelo and Schultze-Berndt 2016:258). While descriptive grammars of these languages amply make use of these and similar categories,[3] Lichtenberk (1995), Angelo and Schultze-Berndt (2016, 2018) and Vuillermet (2018) represent the few attempts to describe these markers as a grammatical category).[4]

2.2.1 Apprehensionality as a semantic domain

In the first piece of published work dedicated to the properties of apprehensional marking, Lichtenberk (1995) claims that the To'abaita ([mlu] Solomonic: Malaita) particle *ada* has a number of functions, though generally speaking, serves to modalise ("epistemically downtone") its prejacent while dually expressing a warning or otherwise some negative attitude about its prejacent. Shown here in (94), he distinguishes: (a) **apprehensive-epistemic** function, a **fear** function (b) and (c-d) **precautioning** functions.

(94) **Apprehensional marking in To'abaita**

a. ***Apprehensive modal*** $\blacklozenge p$
CONTEXT. Dinner's cooking in the clay oven; opening the oven is a labourious process.

ada	*bii*	*na'i*	*ka*	*a'i*	*si*	*'ako*	*ba-na*
APPR	oven_food	this	it:**SEQ**	NEG	it:NEG	be.cooked	LIM-its

'The food in the oven may not be done yet' (295)

[3] TIMITIVE and particularly EVITATIVE a.o are also cited in these descriptive literatures.

[4] An edited collection on *Apprehensional constructions*, edited by Marine Vuillermet, Eva Schultze-Berndt and Martina Faller, is forthcoming via Language Sciences Press. The papers in this volume similarly seeks to address this gap in the literature.

b. ***Embedding under predicate of fearing*** $\textbf{\textit{FEAR}}(\blacklozenge p)$

nau ku ma'u 'asia na'a ***ada*** *to'an na'i ki keka lae mai*
1s FACT be.afraid very **APPR** people this PL they:SEQ go hither
keka thaungi kulu
they:SEQ kill 1p.INCL

'I'm scared the people may have come to kill us.' (297)

c. ***Precautioning*** **("AVERTIVE" function)** $\neg p \rightarrow \blacklozenge q$

riki-a ***ada*** *'oko dekwe-a kwade'e kuki 'ena*
see-it APPR 2s:SEQ break-it empty pot that

'Look out; **otherwise** you may break the empty pot.' (305)

d. ***Precautioning*** **("in-case" function)** $\neg p \rightarrow \blacklozenge(R(q))$

kulu ngali-a kaufa ***ada*** *dani ka 'arungi kulu*
1p.INCL take-PL umbrella **APPR** rain it:SEQ fall.on 1p.INCL

'Let's take umbrellas **in case** we get caught in the rain' (298)

(94a) functions as a possibility modal encoding negative speaker attitude vis-à-vis the eventuality described in its prejacent (i.e. opening the oven in vain). This reading also obtains under the scope of a predicate *ma'u* 'fear' in (94b). Lichtenberk analyses this use of *ada* as a complementizer, introducing a subordinate clause (1995:296).

In each of (c-d), meanwhile, *ada* appears to link two clauses. In both cases it expresses negative speaker attitude with respect to its prejacent (the following clause), which is interpreted as a possible future eventuality, similarly to the English archaism *lest*. In the *avertive* function p *ada* q— translated as 'p otherwise/or else q' — a conditional-like reading obtains: if p doesn't obtain, then q may $(\neg p \rightarrow \blacklozenge q)$. In "in-case" uses, while q is interpreted as a justification for the utterance of p, there is no reasonably inferrable causal relation between the two clauses. For AnderBois and Dąbkowski (2020), "in-case" uses involve some distinct "contextually inferrable" proposition r from which q follows. Effectively, if p doesn't obtain, then some r (a consequence of q) may. In (94d), failing to take umbrellas might result in getting wet (should we get caught in the rain). They appeal to a number of pragmatic factors (reasoning about the plausibility of relations between p and q) in adjudicating between these two readings. This treatment is discussed in some further detail below.

Of particular interest for present purposes is the categorical co-occurrence of SEQ-marking *ka* in the prejacent to *ada*. Lichtenberk notes that the sequential subject-tense portmanteau *appears categorically in these predicates*, independent of their 'temporal status.' He claims that this marking indicates that the encoded proposition '*follows the situation in the preceding clause*' (296, emphasis my own). Relatedly, Vuillermet tentatively suggests that the Ese Ejja *kwajejje* 'AVERTIVE' may derive from a non-past-marked auxiliary with "temporal subordinate" marking (2018:281). The analysis appraised in this chapter proposes a basic semantical link between the expression of the **temporal sequentiality** of a predicate and **apprehensional** semantics.

Drawing on comparative evidence (*viz.* with Lau ([llu] Solomonic: Malaita) and other SE Solomonic languages), Lichtenberk argues that the apprehensional functions of *ada* are

a result of the grammaticalisation of an erstwhile lexical verb with meanings ranging a domain 'see, look at, wake, anticipate' that came to be associated with warning and imprecation for care on the part of the addressee, before further developing the set of readings associated with the present day APPR marker (1995:303-4).

Subsequent typological work has concentrated on fine-tuning and subcategorising apprehensional markers. Notably, Vuillermet (2018) identifies three distinct apprehensional items in Ese Ejja ([ese] Tanakan: SW Amazon) which she refers to as realising an apprehensive *(-chana)*, avertive *(kwajejje)* and timitive *(=yajjajo)* function. These three apprehensionals scope over entire clauses (as a verbal inflection), subordinate clauses (as a specialised complementiser) and noun phrases (as a nominal enclitic) respectively. Similarly to Lichtenberk, Vuillermet suggests that these data provide evidence for a "morphosemantic apprehensional domain" (287).

Adopting this taxonomy, AnderBois and Dąbkowski (2020) focus their attention on the "adjunct" uses of the A'ingae ([con] NW Amazon) apprehensional enclitic *=sa'ne* (*i.e.*, its functions as a precautioning marker and a timitive.) Adapting treatments of the semantics of rationale/purposive clauses, they propose the core meaning given in (95).

(95) AnderBois and Dąbkowski's (2020:12) semantics for A'inge apprehensional adjunct *=sa'ne* (on its avertive/*lest*-like reading)
$[\![$*=sa'ne*$]\!] = \lambda q.\lambda p.\lambda w : \exists i[\textsc{resp}(i,p)].p(w) \wedge \forall w' \in \textsc{goal}_{i,p}(w) : \neg q(w')$
Supposing that some agent i is the agent of p, *=sa'ne* takes a proposition q as its input and outputs a propositional modifier, asserting that, in w, both p holds and the (relevant) GOAL worlds of the agent i are those where q doesn't hold. The semantics can be extended to other precautioning ("in-case") uses and timitive uses by appealing to an third, "inferrable" proposition r.

On the basis of this semantics, AnderBois and Dąbkowski predict that an implicational hierarchy of the form AVERTIVE $\gg$ IN-CASE $\gg$ TIMITIVE holds (2020:16-17).

2.2.2 Apprehensionality in the Kriol context

Dixon (2002:171) refers to the presence of nominal case morphology that marks the AVERSIVE as well as the functionally (and sometimes formally, see Blake 1993:44) related verbal category of apprehensionals as 'pervasive feature of Australian languages' and one that has widely diffused through the continent.[5,6] Lichtenberk (1995:306) marshalls evidence from Diyari ([dif] Karnic: South Australia) to support his claim about a nuanced apprehensional category, drawing from Austin's 1981 grammar. The Diyari examples in (96) below are all adapted from Austin (1981).

[5]Dixon in fact attributes the paucity of work/recognition of this linguistic category to 'grammarians' eurocentric biases' (171).

[6]Aversive case is taken to indicate that the aversive-marked noun is "to be avoided." This corresponds to the TIMITIVE for other authors (e.g. AnderBois and Dąbkowski 2020, Vuillermet 2018)

(96) **Apprehensional marking in Diyari**

a. ***wata*** *yarra* *wapa-**mayi**,* *nhulu* *yinha* *parda-**yathi**,* *nhulu* *yinha*
NEG that way go.**IMP**.EMPH 3S.ERG 2S.ACC catch-**APPR** 3S.ERG 2S.ACC
nhayi-rna
see-IPFV$_{SS}$

'Don't go that way or else he'll catch you when he sees you!' (230)

b. ***wata*** *nganhi* *wapa-yi,* *karna-li* *nganha* *nhayi-**yathi***
NEG 1S.NOM go-PRES person-ERG 1S.ACC see-**APPR**

'I'm not going in case someone sees me' (228)

c. *nganhi* ***yapa**-li* *ngana-yi,* *nganha* *thutyu-yali* *matha~matha-thari-**yathi***
1S.NOM **fear**-ERG be-PRES 1S.ACC reptile.ERG ITER~bite-DUR-**APPR**

'I'm afraid some reptile may bite me' (228)

d. *nhulu-ka* *kinthala-li* *yinanha* *matha-**yathi***
3S.ERG-DEIC dog-ERG 2S.ACC bite-**APPR**

'This dog may bite you' (230)

The sentences in (96) shows a range of syntactic contexts in which Diyari apprehensional *-yathi* 'APPR' appears. The *-yathi*-marked clause appears to be evaluated relative to a prohibitive in (a), a negative-irrealis predicate in (b) and predicate of fearing in (c), or alternatively occurs without any overt linguistic antecedent in (d).[7] In all cases, the predicate over which *-yathi* scopes is **modalised** and expresses a proposition that the speaker identifies as 'unpleasant or harmful' (Austin 1981:227). Little work has been undertaken on the emergence of these meanings.[8]

As we will see in the following sections, apprehensional uses of preposed *bambai* in Kriol have a strikingly similar distribution and semantic import to the apprehensional category described in the Australianist and other typological literatures. Angelo and Schultze-Berndt (2016) focus their attention on demonstrating the cross-linguistic attestation of a grammaticalisation path from (sub)sequential temporal adverbial to innovative apprehensional marking. They suggest that, for Kriol, this innovation has potentially been supported by the presence of like semantic categories in Kriol's Australian substrata. Data from virtually all attested languages of the Roper Gulf are shown in (97). Note that for (almost all of) these languages, there are attested examples of the apprehensional marker appearing in both biclausal structures – the **precautioning**-type uses described in the previous section (p LEST q), as well as "apprehensive" (monoclausal) ones ($\blacklozenge p$).

[7] Austin claims that these clauses are invariably 'structually dependent' (230) on a 'main clause' (*viz.* the antecendent.) We will see in what follows a series of arguments (to some degree foreshadowed by Lichtenberk (1995: 307)) to eschew such a description.

[8] Dixon (2002:171) and Blake (1993:44) are partial exceptions although these both focus on syncretism in case marking rather than dealing explicitly with the diachronic emergence of the apprehensional reading.

(97) **Apprehensional/aversive marking in Roper Gulf languages**

a. **Wubuy**

*numba:-'=da-ya:::-ŋ gada, nama:='ru-**ngun-magi***
2s>1s=spear.for-go-NPST oops 1d.INCL>ANIM=leave-**APPR-APPR**

'Spear it! Ey! Or it will get away from us!' (Heath 1980c:86, interlinearised)

b. **Ngandi**

*a-ḏaŋgu-yuŋ ŋaṛa-waṯi-ji, a-waṭu-ḏu aguṛa-**mili?**-ŋu-**yi***
NCL-meat-ABS 1s>3s-leave-NEG:FUT NCL-dog-ERG 3s>3s-**APPR**-eat-**APPR**

'I won't leave the meat (here), lest the dog eat it.'
(Heath 1978b:106, interlinearised)

c. **Ngalakan**

*garku buru-ye **mele**-ŋun waṛŋ'waṛŋ^{ʔ}-yi^{ʔ}*
high 3ns-put **APPR**-eat.PRES crow-ERG

'They put it up high lest the crows eat it.' (Merlan 1983:102)

d. **Rembarrnga**

*ŋaran-**məʔ**-ɲamʔ ŋa-na laŋə ṛalk*
3s>1p.INCL-**APPR**-bite.PRES 1s>3-see.PST claw big

'He might bite us! I saw his big claws.' (McKay 2011:182)

e. **Ritharrŋu**

*gurrupulu rranha nhe, **wanga** nhuna rra buŋu*
give.FUT 1s.ACC 2s **or else** 2s.ACC 1s hit.FUT

'Give it to me, or else I'll hit you.'
(Heath 1980b, interlinearised & standardised to Yolŋu orthography)

f. **Marra**

*wu-ḷa ṇariya-yur, **wuniŋgi** ŋula ṉiŋgu-way*
go-IMP 3s-ALL **lest** NEG 3s>2s-give.FUT

'Go to him, or else he won't give it to you.'
(Heath 1981:187, cited also in A&SB:284)

g. **Mangarayi**

*bargji ∅-ṇama **baḷaga** ña-way-(y)i-n*
hard 2s-hold **lest** 2s-fall-MOOD-PRES.

'Hold on tight lest you fall!' (Merlan 1989:147, cited also in A&SB:284)

As shown in (97), there is a diversity of formal strategies deployed (or combined) in these languages to realise apprehensional meaning: suffixation inside the verbal paradigm (97a-b), prefixation to the verb stem (97b-d), a separate apprehensional particle (97e-g).

In view of better understanding the semantical unity of these categories and the mechanisms of reanalysis which effect semantic change in *bambai* and its TFA counterparts in

other languages, the distribution and meaning of the 'subsequential' and apprehensional usages of *bambai* are described below.

2.2.3 Temporal frame adverbs and apprehensionality

Angelo and Schultze-Berndt (2016, 2018) provide convincing cross-linguistic evidence of the apparent lexical relationships between temporal frame adverbs and apprehensional markers. This can be taken, prima facie, to provide evidence of markers of temporal relations for recruitment as lexicalised modal operators. Table 2.1 (partially adapted from Angelo and Schultze-Berndt (2016, 2018)) summarises examples from a number of languages where temporal frame adverbials also appear to display a robust apprehensional reading. Further, Angelo and Schultze-Berndt (2016:288) additionally suggest that there is some evidence of apprehensional function emerging in the *bambai* cognates reported in Torres Strait Brokan, [tcs], Hawai'ian Creole [hwc] and Norf'k.

Table 2.1. Etyma and polysemy for apprehensional modals

Language	Adverbial	Gloss[6]	Author (grammar)
Std Dutch [nld]	*straks*	soon	Boogaart (2009, 2020)
Std German [deu]	*nachher*	shortly, afterwards	A&SB (2018)
Marra [mec]	*wuniŋgi*	further	Heath (1981)
Mangarayi [mpc]	*baḷaga*	right now/today	Merlan (1989)
Kriol [rop]	*bambai*	soon, later, then	

Compare these uses of Mangarrayi *baḷaḷaga~baḷaga* in (98) to (97g) above. In (98a), Merlan (1989:138) notes that the temporal frame uses of *baḷaḷaga*—while often translated as 'today'—appears to correspond to 'right now' (she also notes that "Pidgin English informants use [...the reduplicated form] *today-today* to mean 'now' as well as 'today' in the English sense"). In all of these Mangarayi data, *baḷaga* appears to indicate that the event described in the clause that it introduces obtains (or may obtain) subsequently to some time established in the previous clause.

(98) **Mangarayi**

a. *d̲ayi ŋa-yirri-wa-ya-b gurrji,* ***baḷaḷaga*** *ga-ŋa-wa-n*
NEG 1s>3s-see-AUG-PNEG long.ago **today** 3-1s>3s-go.to.see-PRES

'I hadn't seen it before, today I'm seeing it.'
(Merlan 1989:138, cited also in A&SB 2018:13)

b. *galaji ŋan?-ma* ***baḷaga*** *yag*
quickly ask-IMP **before** go

'Ask him quick before he goes.' (Merlan 1989:147, cited also in A&SB: 284)

[6]This isn't to suggest that the semantics of those words provided in the 'GLOSS' column in the table above ought to be treated as identical identical: the definitions seek to capture a generalisation about sequentiality. A prediction that falls out of this generalisation is that TFAs like 'later, soon, afterwards, then' might be best interpretable interpretable as subsets of this category.

c. *a-ŋaḷa-yag* ***baḷaga*** *miḷiḷitma*
HORT-1p.INCL-go **before** sunset

'Let's go before the sun sets.' (Merlan 1989:147)

d. *ŋiñag ŋaḷa-bu-n guṛuugguṛug-bayi,* ***wuṛay*** *ḍoʔ a-ŋayan-ma*
PROH 1p.INCL-kill-PRES white.people-FOC **later** shoot IRR-3s>1p.INCL-AUX

'We can't kill white people. Later on they might shoot us.' (Merlan 1989:147)

(99) **Marra**

wayburi jaj-gu-yi ***wuniŋgi:*** *gaya bayi gal-u-jingi*
southward chase-3s>3s.PST **more** there in.south bite-3s>3s-did

'Then [the dingo] chased [the emu] a bit more in the south.' (Heath 1981:360)

Note additionally the apparently apprehensional use of *wuṛay* 'later' in (98d). While Merlan makes no mention of the "evitative/anticipatory" uses of this adverb, this type of use context is a likely source for the type of apprehensional and causal/elaboratory inferences invited by temporal frame adverbials.

Merlan (1989:147) glosses *baḷaga* as 'EVITATIVE/ANTICIPATORY', commenting that these two notions are "sometimes indistinguishable." She also notes the formal (reduplicative) relation to frame adverbial *baḷaḷaga* 'right now, today', commenting on the shared property of "immediacy" that links all these readings. Of *wuniŋgi*, Heath (1981:308) suggests translations of 'farther along, furthermore, in addition' (common in text translations) in addition to (elicited) apprehensional readings. He explicitly notes the similarity between this apparent polysemy and Kriol *bambay* (sic) (given the "closeness" of the sense of 'later' to that of 'farther along'.)

2.3 The distribution of *bambai*

This section (informally) describes the distribution and meaning of both temporal-frame and apprehensional readings of *bambai* in the data. The Kriol data cited here draws from Angelo and Schultze-Berndt ([*A&SB*], 2016) and the Kriol Bible ([*KB*], The Bible Society in Australia 2007) in addition to elicitations from, and conversations with, native speakers of Kriol recorded in Ngukurr predominantly in 2016 and 2017.

2.3.1 Temporal frame use

Temporal frame adverbials (TFAs) are linguistic expressions that are used to refer a particular interval of time, serving to precise the *location* of a given eventuality on a timeline. As an example, TFAs include expressions like *this morning* or *tomorrow*, which situate the eventuality that they modifies within the morning of the day of utterance or the day subsequent to the day of utterance respectively (see Binnick 1991:307).

Formally, we can model the contribution of temporal expression by assuming a set $\mathcal{T}$ of points in time which are all strictly ordered with respect to each other chronologically. This is represented by a PRECEDENCE RELATION $\prec$ (where $t_1 \prec t_2 \leftrightarrow t_1$ precedes t_2). A TFA like *today*, then, is a predicate of times: it picks out all the points in time between the beginning

and the end of the day of utterance. In the sentence *Mel ate today*, the TFA restricts the instantiation time of the eating event (t_e) to this interval. That is, *Mel ate today* is true iff Mel ate at t_e and $\underset{\text{start-of-day}}{t_1} \prec t_e \prec \underset{\text{end-of-day}}{t_2}$. This can be represented using an interval notation as $t_e \in [t_1, t_2]$.

As discussed in §2.1, Kriol *bambai* is derived from an archaic English temporal frame adverbial, *by-and-by* 'soon', a lexical item with some currency in the nautical jargon used by multiethnic sailing crews in South Pacific in the nineteenth century. The general function of *by-and-by* has been retained in contemporary Kriol, namely to temporally advance a discourse, much as Standard Australian English uses expressions of the type 'soon/a little while later/shortly after(wards)' or 'then.' These expressions represent a subset of 'temporal frame adverbials': clause modifiers that delimit the temporal domain in which some predicate is instantiated. In this work, I refer to the relevant set of TFAs as *subsequentiality* ('SUBSEQ') adverbials. The motivation for describing this as a semantic subcategory (a special case of the prospective) is the robust intuition that, in addition to temporally advancing the discourse (*i.e.*, marking the instantiation of the prejacent predicate posterior to a given reference time), SUBSEQ TFAs give rise to a salient, truth-conditional expectation that the predicate which they modify obtain in non-immediate sequence with, but in the **near future** of a time provided by the context of utterance. This general function of *by-and-by* is attested in the contact varieties (*i.e.*, pidgins) spoken in the nineteenth century in Australia; this is shown in (100).

(100) An excerpt from a (diagrammatic) explanation of betrothal customs and the genealogy of one couple as given to T A Parkhouse by speakers of a Northern Territory pidgin variety from the Larrakia nation in the late nineteenth century. (Parkhouse 1895:4, also cited in Harris 1986:299.) My translation (incl. subscript indexation).

... that fellow lubra him have em nimm.
that ATTR woman 3s have TR boy

by-and-by *him catch him lubra, him have em nimm.*
bambai 3s catch TR woman 3s have TR boy

Him lubra have em bun-ngilla. ***By-and-by*** *girl big fellow, him nao'wa*
3s woman have TR girl ***bambai*** girl big ATTR 3s husband
catch him, him méloa have em bun-ngilla.
catch 3s 3s pregnant have TR girl

By-and-by *nimm big fellow, by-and-by bun-ngilla big fellow, him catch him.*
bambai boy big ATTR ***bambai*** girl big ATTR 3s catch 3s

'...That woman$_h$ had a son$_i$. Later, he$_i$ got a wife and had a son$_j$. This woman$_k$ had a daughter$_\ell$. Then, when the girl$_\ell$ had grown up, her husband got her$_\ell$ pregnant, she$_\ell$ had a daughter$_m$. Then, when the boy$_j$ was grown and the girl$_m$ was grown, he$_j$ got her$_m$.'

Note that, according to Parkhouse, (100) constitutes a description of the relationship history of one couple; each sentence is past-referring. There is no tense marking in the Pidgin narrative. In each of the *by-and-by* clauses in (100), the speaker asserts that the event being modified is *subsequent* to a reference time set by the previous event description. In this respect, *by-and-by* imposes a temporal frame on the event description that it modifies.

As we have seen above (e.g. 92), the SUBSEQ-denoting function of *bambai* shown here has been retained in Kriol. This reading is shown again in the two sentences in (101). The schema in (101c) provides an informal representation of this context-dependent, "subsequential" temporal contribution.

(101) a. **Context:** During a flood a group of people including the speaker have moved to a dry place up the road

mela bin ol mub deya na, jidan deya na, ***bambai*** *elikopta bin*
1p.EXCL PST all move there now sit there now ***bambai*** helicopter PST
kam deya na, detlot deya na garra kemra
come there now DET:PL there now have camera

'We all moved there, **then** a helicopter came, the people there had cameras'
[A&SB: 271]

b. **Context:** Eve has conceived a child.

Bambai *imbin abum lilboi*
bambai 3s.PST have boy

'Subsequently, she had (gave birth to) a boy' [KB: Jen 4.1]

c. **Instantiation for subsequential reading** *(to be revised)*

t_r ——————— $\boldsymbol{t_e}$ ..... t^+

The eventuality described by the predicate is instantiated at some time t_e in the future of a reference time t_r. t_r is contextually determined—by an antecedent proposition if present—or otherwise established by the discourse context. Further, subsequential TFAs impose a requirement that t_e obtain within some constrained interval subsequent to t_r (that is, before t^+).

As shown in (101a) above, the arrival of the helicopter (and its associated camera crew) is modified by *bambai qua* TFA. This has the effect of displacing the instantiation time forward with respect to the reference time provided by the first clause. *Bambai* has the effect of displacing the instantiation of helicopter-arrival forward in time with respect to the reference time provided by the first clause (*sc.* the time that the group had moved to a dry place up the road).

Similarly, (b) asserts that the eventuality described by the prejacent to *bambai* (namely the birth of Cain) is instantiated in the near future of some reference time t_r provided contextually, albeit not by a linguistically overt antecedent clause. That is, Eve gave birth at some $t_e \in \{t'_e : t_r \prec t'_e \prec t^+\}$.[9] The subsequent verse *Bambai na Ib bin abum najawan lilboi* (KB Jen 4:2) 'Soon after *that*, Eve had another boy' further displaces the birth event of Abel. Subsequential TFAs are distinguished by this 'near future' restriction, underpinned by a set of conversational expectations over reasonable degrees of "soonness."

Here we have seen an overview of the semantic contribution of *bambai* in its capacity as a 'subsequential' TFA. A discussion of apprehensional uses follows.

[9] This is not to suggest the referability of some 'latest bound' reference time t_r^+. The latter merely represents a (vague) contextual expectation by which the event described by the prejacent had better have obtained for the whole sentence to be judged true. See §2.5 for further discussion of this device.

2.3.2 Apprehensional use

In his survey of "apprehensional modality", Lichtenberk describes apprehensionals like To'abaita *ada* as having a dual effect on their prejacents: *epistemic downtoning — i.e.*, 'signal[ling] the [speaker's] relative uncertainty [...] about the factual status of the proposition' — and (a shade of) *volitive modality* — 'the fear that an undesirable state of affairs may obtain' (1995:295-6). While we are not committed to Lichtenberk's metalinguistic labels a this stage (to be further investigated below), a modal meaning for Kriol *bambai* is shown below. We will see how use diverges from the subsequential/temporal frame uses described so far.

2.3.2.1 *p* ***bambai*** *q* **: the conditional use**

Indicative 'nonimplicationals.' Angelo and Schultze-Berndt (2016:272*ff*) observe that apprehensional *bambai* occurs with both: an 'admonitory' illocutionary force in a precautioning/warning sense (*e.g.* 102a); in addition to declarative illocutionary acts where the speaker formulates a prediction of undesirable eventuality as the possible outcome of some discourse situation (e.g. 102c).

The sentence data in (102) demonstrate how *bambai*-sentences are used to talk about undesirable possible future eventualities. Modelling this, we enrich the time model introduced in the previous subsection by postulating a set of *possible worlds* $\mathcal{W}$. Following standard assumptions, a "proposition" ($p \in \mathcal{W} \times \{\mathbb{T}, \mathbb{F}\}$) is a set of possible worlds, namely those in which it is true (e.g. Kratzer 1977, Kripke 1963, Stalnaker 1979, a.o.)

Generally speaking, the construction *p bambai q*, on its apprehensional reading, appears to be encoding converse nonimplication between its arguments: 'if some situation p doesn't obtain in w, then the (unfortunate) situation described in q might' ($\neg p(w) \rightarrow \blacklozenge q(w)$). Additional data showing these uses is shown in (102) below.

(102) a. **Context:** Two children are playing on a car. They are warned to stop.

Ey! ***bambai***$_1$ *yundubala breikim thet motika, livim.* ***bambai***$_2$ *dedi graul*
Hey! ***bambai*** 2d break DEM car leave ***bambai*** Dad scold
la yu
LOC 2s

'Hey! You two might break the car; leave it alone. Otherwise Dad will tell you off!' [A&SB: 273]

b. *yu stap ritjimbat mi na* ***bambai*** *ai kili yu ded en mi nomo leigi*
2s stop chase.IPFV 1s EMP **bambai** 1s kill 2s dead and 1s NEG like
meigi yu braja jeikab nogudbinji
make 2s brother jacob unhappy

'Stop chasing me or I'll kill you and I don't want to upset your brother Jacob (*sic*)' [GT 22062016-21', retelling KB 2Sem 2.22]

c. *ai garra go la shop ba baiyim daga,* ***bambai*** *ai (mait) abu no*
1s IRR go LOC shop PURP buy food ***bambai*** 1s (POSS) have no
daga ba dringgi main medisin
food PURP drink my medicine

'I have to go to the shop to by food **otherwise** I may not have food to take with my medicine' [AJ 23022017]

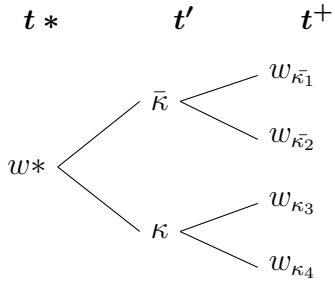
In (102a), there are two tokens of apprehensional *bambai*. The second *(bambai$_2$)* appears to be anaphoric on imperative *livim!* 'leave [it] alone!' Notably, it appears that the Speaker is warning the children she addresses that a failure to observe her advice may result in their being told off ($\neg p \rightarrow \blacklozenge q$) — unlike the uses of *bambai* presented in the previous subsection, *bambai* here is translatable as 'lest/otherwise/or else.' *bambai*$_1$, the first token in (102a), appears to have a similar function, although has no overt sentential antecedent.[10] In this case, the Speaker is issuing a general warning/admonition about the children's behaviour at speech time. In uttering the *bambai*$_1$ clause, she asserts that, should they fail to heed this warning, an event of their breaking the car is a possible outcome. (a) shows a similar use. (102c) provides an example of an apprehensional/LEST-type reading occurring in a narrative context: here the Speaker identifies a possible unfortunate future situation in which she has no food with which to take her medicine. Here, in uttering the *bambai* clause, she asserts that such an eventuality is a possible outcome should she fail to go to the shop to purchase food. This reading is robustly attested in contexts where the antecendent is modified by some irrealis operator. The example from (93) is repeated below as (103): here *bambai* makes a modalised claim: if κ is a set of worlds in which I drink coffee at t' (and $\overline{\kappa}$ is its complement), then an utterance of (103) asserts that $\exists w \in \overline{\kappa}$: I sleep by t^+ in w.

(103) a. **Context:** It's noon and I have six hours of work after this phonecall. I tell my colleague:

ai=rra dringgi kofi ***bambai*** *mi gurrumuk la desk iya gin*
1s=IRR drink coffee *bambai* 1s fall.asleep LOC desk here EMPH

'I'd better have a coffee otherwise I might pass out right here on the desk' [GT 28052016]

b. **Instantiation schema for *apprehensional* reading in (a)**



In the reference world $w*$ at speech time $t*$, the Speaker establishes a partition over possible futures: they are separated into those in which, at time t', he drinks coffee $\{w' \mid w' \in \kappa\}$ and those in which he doesn't $\{w' \mid w' \in \overline{\kappa}\}$. In

[10] In reconstructing this sentence context, a consultant unprompted introduced an explicit antecent: *gita burru det mutika, bambai yu breigim im* 'get off the car! Otherwise you might break it!' [GT 20170316]

those worlds where he fails to drink coffee, there exist possible futures ($w_{\neg\kappa_1} \vee w_{\neg\kappa_2}$) in which he is asleep by some future time t^+.

Of particular note is this behavior where *bambai* appears to be anaphoric on **the negation** of a proposition that is calculated on the basis of a linguistically represented antecedent (that is, the preceding clause.) This appears to be categorical. This is demonstrated in (104) below, where a SUBSEQ reading of *bambai* is infelicitous. Only the apprehensional reading is available, where the prejacent *mi gurrumuk* 'I fall asleep' is interpreted as a possible outcome of **not** watching a film.

(104) **Context:** The Speaker is experiencing a bout of insomnia

# *airra wotji muvi bambai mi gurrumuk*
1S=IRR watch film *bambai* 1S fall.asleep

#**Intended:** I'll watch a film, then I'll (be able to) fall asleep [AJ 23022017]
Available reading: I'll watch a film, otherwise I may fall asleep

The relationship between the antecedent clause and the context on which *bambai* is anaphoric is further discussed below in §§2.5.4.

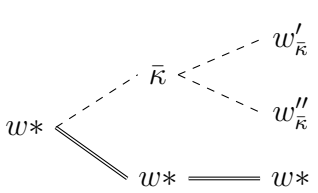
Counterfactual 'nonimplicationals' *bambai* similarly receives an apprehensional reading in subjunctive/counterfactual contexts: those where an alternative historical reality is considered (see, e.g., von Fintel 2012). (105) below provides an example of apprehensional *bambai* in one such context.

In (105), the Speaker identifies that in some alternative world (w') in which he behaved differently to the way in which he did in the evaluation world ($w' \not\simeq w*$)[11] — namely one in which the event described in the antecedent failed to obtain — there is a (significant) possibility that he would have slept at work. Consequently, and comparably to the example (104) above, *bambai* modalises its prejacent: it asserts that $\exists w'[w' \notin \kappa \wedge$ I sleep by t^+ in $w']$.

(105) a. *ai=bin dringgi kofi nairram **bambai** ai bina silip~silip-bat la wek*
1S=PST drink coffee night **bambai** 1S PST:IRR sleep~DUR-IPFV LOC work

'I had coffee last night **otherwise** I might have slept at work' [AJ 23022017]

b. **Instantiation schema for apprehensional reading in (a)**



Here, the Speaker considers a set of worlds that historically diverge from the evaluation world $w*$, namely the set of worlds where, unlike the evaluation world, the Speaker did not drink coffee at t' — $\{w' \mid w' \in \bar{\kappa}\}$. The Speaker

[11] A definition and further discussion the $\simeq$-relation ("historical alternative to") is given in (125).

asserts that there are some possible near futures to $\langle t', w_{\bar{\kappa}} \rangle$ in which he falls asleep by some time t^+, posterior to t'.

The Kriol apprehensional data described so far is intuitively unifiable and bears some amount of syntactic similarity to familiar conditional constructions *(i.e.*, that of an "infixed" two-place relation between two propositions.) For all examples we have seen so far, *bambai* introduces an predicate that describes an eventuality q which construes as undesirable for the speaker. It appears to that this eventuality is a *possible, foreseeable* future outcome of some other contextually provided proposition, which is often interpreted as the negation of a previous clause.

The 'indicative' and 'counterfactual' uses presented here can be unified by appealing to the notion of "settledness" presuppositions (e.g. Condoravdi 2002:82, *passim*): in those contexts where the prejacent is understood to be being asserted of a future time ($t_e \succ t*$) or a different world ($w' \not\simeq w*$), those where the Speaker could not possibly have access to a determinate set of facts, the Speaker $\boldsymbol{R}$-implicates (see Horn 1984) that they are making a prediction; the entire proposition construes as modalised. The reference world and time are provided by some tensed or modalised antecedent proposition, linguistically overt or otherwise. Of additional interest is the fact that, in the examples we have seen so far, the instantiation of the predicate that is modified by *bambai* appears to be a potential consequence of the non-instantiation of the antecedent to *bambai.* This observation is further spelled out in §2.5.2 below. We turn first to additional, "apprehensive" uses of *bambai*.

2.3.2.2 *bambai* as a modal adverbial

In contrast to these 'nonimplicational' or precautioning (*i.e.* LEST/'in case'-type) readings presented immediately above, *bambai* also appears to function as an epistemic adverbial with apprehensional use conditions: Lichtenberk's *"apprehensional-epistemic"* function and Vuillermet's *"apprehensive"*.[12] As we will see, this function of *bambai* arises in monoclausal contexts in addition to within conditional constructions. Note that this distributional fact can be taken to demonstrate that (unlike apprehensive markers in other languages) , syntactically speaking, *bambai* is **not** a subordinator: it doesn't introduce a dependent clause (e.g., Blühdorn 2008, Cristofaro 2005). Consider first the elaboration of (103) in (106) below. Here there is no explicit linguistic antecedent for *bambai*, whereas its prejacent encodes an unfortunate future possibility.

(106) **Context:** Grant's heading to bed. Josh offers him a cuppa.

A. *yu wandi kofi muliri?*
2s want coffee KINSHIP.TERM

'Did you want a coffee, *muliri*?'

B. *najing, im rait muliri!* ***bambai*** *ai kaan silip bobala! Ai*
no 3s okay KINSHIP.TERM ***bambai*** 1s NEG:IRR sleep poor 1s
mait weik ol nait... garram red ai...
might awake all night POSS red eye

'No it's fine *muliri*! *bambai* I might not sleep, I could be awake all night... be red-eyed (in the morning)... [GT 16032017 17']

[12] Note however that *bambai*$_1$ in (102a) also represents a use like this.

Similarly, in the exchange in (107) below, **B** deploys *bambai* to thee same effect in two single-clause utterances; each encoding an unfortunate future possibility.

(107) **Context:** Two relatives (A, B) are planning a hunting trip; a younger relative wants to join.

A. *im rait, yu digi im then gajin.*
3s okay 2s take 3s then KINSHIP

'It's fine, bring him along poison-cousin'

B. ***Bambai*** *yunmi gaan faindi bip*
bambai 1d.INCL NEG.IRR find meat

'But then we may not be able to find meat'

A. *Yunmi garra digi im*
1d.INCL IRR take 3s

'We'll take him'

B. ***bambai*** *im gaan gibi la yunmi.*
bambai 3s NEG.IRR give LOC 1s.INCL

'But then [the country] may not provide for us.' [DW 20170712]

Additionally, in (108) below, Lichtenberk's (1995) "epistemic downtoning" function is clearly shown, *bambai* behaving as a species of possibility modal ($\textit{bambai}\ q = \blacklozenge q$). In this case, where the speaker doesn't *know* who's at the door, she makes a claim about how—in view of what she *does* know and might expect to be happening—the (present-tensed) situation described in the prejacent is a distinct possibility (and a distinctly undesirable one at that.)

(108) **Context:** Speaker is at home to avoid running into her boss. There's a knock at the door; she says to her sister:

Gardi! ***Bambai*** *im main bos iya la det dowa rait na*
Agh ***bambai*** 3s my boss here LOC the door right now

'Oh no! That could be my boss at the door.' [AJ 02052020]

In these apprehensional-epistemic occurrences, *bambai* has entered into the functional domain of other epistemic adverbials (notably *marri~maitbi* 'perhaps, maybe'.) Note that the availability of epistemic readings to linguistic expressions with future-orientation is well-attested in English cross-linguistically (e.g., *the bell just rang, it'll be Hanna/it's gonna be Hanna*, see also Condoravdi 2003, Werner 2006, Winans 2016.) Giannakidou and Mari (2018), for example, defend an analysis of that unifies future tense morphology with epistemic modality, appealing to data like the English epistemic future and its corollaries in Greek and Italian to argue that future markers in these languages always encode epistemic necessity. We will have further observations to make on these facts below.

Apprehensive counterfactual The relation between the counterfactual prejacent to *bambai* and the content of the preceding clause appears to diverge from the patterns of data

described in the previous subsection. As with the epistemic adverb uses above, in (109), *bambai* appears to introduce a modalised assertion and expresses negative speaker affect. Its interpretation doesn't appear to be restricted by the preceding question. Similarly to the usage in (108), *bambai* appears to behave here as an apprehensive modal, encoding an unfortunate possible eventuality.

(109) *Wotfo yu nomo bin jinggabat basdam,* ***bambai*** *ola men bina silipbat*
why 2s NEG PST think before, **APPR** all man PST:IRR sleep.IPFV
garram yu waif? Yu bina meigim loda trabul blanga melabat
with 2s wife 2s PST:IRR make much trouble DAT 1p.EXCL

'Why didn't you think [to say something] earlier; the men might have slept with your wife. You could have caused many problems for us!' [KB Jen 26.10]

***if*-Conditionals** In contrast to the 'nonimplicational' (*i.e.* precautioning/LEST-type) readings presented immediately above, Kriol also forms conditional sentences using an English-like *if...(then)* construction. The two sentences in (110) give examples of an indicative and subjunctive *if*-conditional, where *bambai* modiifies the consequent clause (the "apodosis.")

(110) a. *if ai dringgi kofi* ***bambai*** *mi* #*(nomo) gurrumuk*
if 1s drink coffee ***bambai*** 1s #(NEG) sleep

'If I drink coffee then I might not sleep' [AJ 23022017]

b. *if ai=ni=min-a dringgi det kofi* ***bambai*** *ai(#=ni)=bin-a gurrumuk*
if 1s=NEG=PST-IRR drink the coffee ***bambai*** 1s(#=NEG)=PST-IRR be.asleep
jeya
there

Intended:'If I hadn't drunk coffee then I may well have fallen asleep there'
(This reading is available if *=ni(m)o* 'NEG' is omitted) [GT 16032017]

The contrast between (110a,b) and their *if*-less counterparts in (103a;105a) respectively, evinces some restriction that *if*-clauses apparently force on the interpretation of *bambai*. Whereas the *if*-less sentences presented previously assert that a particular eventuality may obtain/have obtained just in case the antecedent predicate **fails**/failed to instantiate (*i.e.*, the LEST readings), the sentences in (110) diverge sharply from this interpretation. That is, each of the *if* p*, bambai* q sentences in (110) asserts a straightforward conditional $p \rightarrow \blacklozenge q$: should the antecedent proposition hold (have held), then q may (have) obtain(ed).

In this respect, similarly to the monoclausal uses presented in this subsection, *bambai* appears to be behaving truth conditionally as a modal expression encoding possibility. The MODAL DOMAIN is explicitly restricted by the (syntactically subordinate) *if*-clause, whose sole function can be taken to involve the restriction of a domain of quantification (cf. Kratzer 1979, Lewis 1975, von Fintel 1994).

Apprehensionality: competition with *marri* As with the other uses discussed in this subsection, then, *bambai* functions as a possibility adverbial whose domain can be restricted by the presence of an *if*-clause. As a possibility adverbial, *bambai* has entered into

the semantic domain of other Kriol lexical items including *marri* 'maybe'. Crucially though, the examples in (111-112) below serve to evince the perseverance of apprehensional expressive content in these syntactic frames. In (111a), consultants reported that apprehensive *bambai* gives rise to an implication that the speaker may not go on holiday, where the minimally different (b) fails to give rise to this implication.[13]

(111) **Context:** I'm planning a trip out to country but Sumoki has taken ill...

a. *if ai gu la holiday,* ***bambai*** *main dog dai*
if 1s go LOC holiday ***bambai*** 1s dog die

'If I go on holiday, my dog may die' $\rightsquigarrow$ I'm likely to cancel my holiday

b. *if ai gu la holiday,* ***marri*** *main dog (garra) dai*
if 1s go LOC holiday **perhaps** 1s dog (IRR) die

'If I go on holiday, my dog may die' $\not\rightsquigarrow$ I'm likely to cancel my holiday
[AJ 04082017]

Here, the contrast between (a) and (b) is attributable to the expressive content of *bambai* (e.g. Kaplan 1999). That *bambai* licenses an implicature that the Speaker is considering cancelling her holiday to tend to her sick pet, an inference that isn't invited by neutral epistemic counterpart *marri* provides strong evidence of the semanticisation of *bambai*'s expressive content (similar to 'sincerity'- or 'use-conditions' for a given lexical item.) The extent of this process is further evinced in (112) below, where the selection of *marri* instead of *bambai* gives rise to a conventional implicature that the Speaker's utterance of (112) ought not be interpreted as the expression of a desire to prevent her daughter's participation in the football game.

(112) **Context:** I am cognizant of the possibility that my daughter injures herself playing rugby.
#**Context:** I am uncomfortable with the likelihood of my daughter injuring herself playing rugby.

if im pleiplei fudi, marri main doda breigi im leig
if 3s play footy *perhaps* my daughter break her leg

'If she plays footy my daughter may break her leg' $\not\rightsquigarrow$ [so she shouldn't play]
[AJ 04082017]

Based on this evidence, we may conclude that the ostensible encroachment of *bambai* into the domain of epistemic adverbials has given rise to a privative dyad (*i.e.* 'Horn scale', see Horn 1984: 33-8) of the type $\langle$*marri, bambai*$\rangle$ — that is, an utterance of *marri p* conventionally implicates that the Speaker was not in a position to utter *bambai p*. That is, the meaning of the 'weaker' expression comes (via hearer-based/$\mathcal{Q}$-implicature) to represent the relative complement of the stronger in a given semantic domain: here that the neutral epistemic adverbial comes to conventionally implicate *non-apprehensional* readings/modalities:

$$[\![marri]\!] \approx \Diamond \setminus [\![bambai]\!]$$

[13] In this second example with *marri*, the consultant suggests that (in contrast to (a)): *tharran jeya im min yu garra gu la holiday* 'that one means you'll go on your holiday.'

2.3.3 Summary

In the preceding sections, we have seen clear evidence that *bambai* has a number of distinct readings. Nevertheless, we can draw a series of descriptive generalisations about the linguistic contexts in which these readings emerge. These are summarised in (113).

(113) **Semantic conditions licensing readings of *bambai*.**

a. *bambai* is interpreted as a **subsequential temporal frame** when the state-of-affairs being spoken about is **settled**/the same as the actual world ($w' \simeq w*$) (*i.e.*, in **factual**, **nonfuture** contexts).

b. In other (**nonfactual**) contexts (that is, in predications that fail to satisfy SETTLEDNESS) apprehensional readings "emerge".

c. In apprehensional contexts, LEST-type uses occur in a p *bambai* q construction. Here, $\blacklozenge q$ is interpreted relative to $\neg p$

As discussed in the preceding sections, **nonfactual** utterances are those in which (a) a predicate is understood to obtain in the future of evaluation time $t*$/***now*** or (b) the predicate is understood as describing some w' which is not a historic alternative to the evaluation world $w*$. It is in exactly these contexts that *bambai* give rise to a modalised reading. In Kriol, a number of linguistic operators (which we have seen in the data presented above) appear to "trigger" predication into an unsettled timeline. A selection of these is summarised in Table 2.2 below.

Table 2.2. Semantic operators[14] that give rise to modalised readings of *bambai*

GLOSS	Form	*Example*
IRREALIS	*garra*	*ai**rra** dringgi kofi **bambai** mi gurrumuk* 'I'll have a coffee or I might fall asleep'
NEGATIVE IRREALIS	*kaan*	*ai **kaan** dringgi kofi **bambai** mi nomo silip* 'I won't have a coffee or I mightn't sleep'
C'FACTUAL	*bina* PST:IRR	*aibin dringgi kofi nairram **bambai** ai**bina** gurrumuk* 'I had a coffee last night or I might've passed out'
IMPERATIVE	∅	*yumo jidan wanpleis **bambai** mela nogud*[15] 'Youse sit still or we might get cross'
PROHIBITIVE	∅ IMPR [*nomo*]	***nomo** krosim det riba, **bambai** yu flodawei* 'Don't cross the river or you could be swept away!'
GENERIC	∅	*im gud ba stap wen yu confyus, **bambai** yu ardim yu hed* 'It's best to stop when you're confused, or you could get a headache'
NEGATIVE GENERIC	∅ GEN [*nomo*]	*ai **nomo** dringgi kofi enimo, **bambai** mi fil nogud* 'I don't drink coffee anymore or I feel unwell'
CONDITIONAL	*if*	***if** ai dringgi kofi, **bambai** ai kaan silip* 'If I have coffee, then I mightn't sleep'

[8]This is not intended to suggest that these operators are in any way semantic primitives, Table 2.2 is to be read as a non-exhaustive list of linguistic devices that appear to associate with nonfactual mood.

[9]This example due to Dickson (2015:168 [KM 20130508]).

2.4 Apprehensional readings emerge in subsequential TFAs

Here I consider a number of linguistic factors that appear to have contributed to the emergence of apprehensional readings of TFAs. As shown in §2.2.3, this meaning change pathway (and apparent polysemy between temporal and apprehensional uses) has been observed by a handful of other authors (Angelo and Schultze-Berndt 2016, 2018, Boogaart 2020) on the basis of data including German *nachher* and Dutch *straks* in addition to Kriol *bambai* (see also Kuteva et al. 2019:427-8). Parallels between *bambai* and *straks*, for example, are shown in the contrast between a subsequential and apprehensional reading in (114) below.

(114) The *straksconstructie* in Dutch (see also Boogaart 2020)

a. **context.** It's 3.30, the shop closes at 4. I tell my friend:

de winkel is straks gesloten
the shop is *straks* closed

'The shop will be closed soon.'

b. **context.** It's 3.50, the shop closes at either 4 or midnight, I'm unsure which. I say to my friend:

straks is de winkel gesloten!
straks is the shop closed

'The shop may be closed!' [Mireille L'Amie, *p.c.* 20200130]

***bambai* and conditional modality** Numerous authors (*e.g.*, Blühdorn 2008, Culicover and Jackendoff 1997, Harder 1995, Klinedinst and Rothschild 2012, Schmerling 1975, Stukker and Sanders 2012 a.o.) have investigated the semantic dependencies that often obtain between clauses that are *syntactically coordinate*. These include the "conditional readings" of *and* and *or*, in addition to asyndetic constructions of the type: *John comes, I leave* (where my departure is interpreted as a consequence of his arrival.) In these cases, although the second clause is interpreted as being "semantically subordinate" to the first, this relation is not made explicit in the syntax (see Ch. 1 and also Roberts 1989, 1990, 2020 for discussion and an implementation of "modal subordination".)

Relatedly, consider the parallels between interrogative and conditional clauses (operationalised in an information structure framework in § 1.3.3 above.) The functional motivation for these appears to be that conditional apodoses (consequent clauses) can be understood as answering a "question" posed by the antecedent/protasis. This is clearly demonstrated for Danish by Harder (1995:101-2), replicated in (115) below.

(115) a. **A two-participant discourse**

A. *Kommer du i aften?*
Are you coming tonight?

B. *ja*
Yes

A. *Så laver jeg en lækker middag*
Then I'll cook a nice dinner.

b. *Kommer du i aften, (så) laver jeg en lækker middag*
'If you're coming tonight, (then) I'll cook a nice dinner.'

Harder (1995:101) suggests that "the conditional can be seen as a way of *telescoping a discourse sequence into one utterance* so that **B** has to respond not only on the basis of the present situation, but also on the basis of a possible future."

Consider the discourses in (116-118) below.

(116) **Context:** A child is playing on a car and is told to stop.

A. *gita la jeya!*
get off LOC there!

B. *ba wani?*
why?

A. *bambai yu breigim motika*
bambai 2s break car

'Get off of there [...why?...] In a minute, you'll break the car!' [GT 16032017]

(117) **Context:** It's the wet season and the Wilton River crossing has flooded.

A. *nomo krosim det riba!*
NEG cross.TR the river

B. *ba wani?*
why?

A. *bambai yu flodawei!*
bambai 2s float away

'Don't cross the river [...why not?...] In a minute, you'll be swept away!'[GT 16032017]

(118) **Context:** A snake slithered past *A*'s leg.

A. *det sineik bin bratinim mi!*
the snake PST frighten.TR me

B. *ba wani?*
why?

A. *bambai imina baitim mi!*
bambai 3s.PST:IRR bite.TR 1s

'The snake scared me [...why?...] It might've been about to bite me!'[GT 01052017]

In all of the short discourses above, the translation provided elucidates the capacity of the temporal properties of *bambai qua* sequential TFA to implicate additional nontemporal properties of the relation between the clauses it links. In each of the examples, **A**'s response identifies an eventuality that might obtain in the near future (of the speech-time for (116-117) and of the slithering/frightening-time for (118).

Via pragmatic strengthening *(viz.* an inference of the form *post hoc ergo propter hoc)*, *bambai* can be understood to assert that there exists some type of logical (*e.g.* etiological) relation between the predicate contained in the first proposition and the eventuality described in *bambai*'s prejacent: the second clause. In (116), for example, the child's failure to comply with **A**'s (precautioning) instruction could contribute causally to the car's breaking. Inferencing-based theories of meaning change will hold that, while there is no lexical item that encodes causality, in many contexts, reasoning about informativity and relevance "invite" the *propter hoc* inference (Geis and Zwicky 1971:see).

This type of implicature is well-documented in cross-linguistic studies of meaning change (see also Kuteva et al. 2019:403); the extension of English *since* (*siþþan*) from encoding subsequentiality (they report ostensibly similar shifts in numerous other language) to causality (particularly when talking about past events) is discussed by Traugott and König (1991):

(119) a. I have done quite a bit of writing **since** we last met (temporal)

b. **Since** Susan left him, John has been very miserable (temporal, causal)

c. **Since** you are not coming with me, I will have to go alone (causal)

d. **Since** you are so angry, there is no point in talking with you (causal)

Traugott & König go on to say:

> With *since*, when both clauses refer to events, especially events in the past, the reading is typically temporal, as in [119a] When one clause refers to a non- past event or to a state, the reading is typically causal, as in [119c] and [119d], but the causal reading is not required, as [119b] indicates. The contrastive readings in [119b] signal polysemy, i.e. conventionalized meanings, not just conversational. (1991:195)

It appears, then, that precautioning type uses of *bambai* arise from a related inference, namely the conventionalisation of an inference that emerges on the basis of reasoning about relevance: "if **A** is alerting me that a possible event e_1 may be followed by another possible event e_2, it's likely that they're drawing a causal connection between these two possible events" (viz. e_1 causes e_2).

***bambai* and apprehensional expressive content** Crucially, apprehensionals additionally conventionally implicate information about the Speaker's attitude vis-à-vis their prejacent. Angelo and Schultze-Berndt (2016) propose that:

> The conventionalisation of the implicature of undesirability may come about through frequent use of a clausal sequence in which the first clause has the illocutionary force of a directive and the second is introduced by the temporal marker. (285)

Synchronically, the apprehensional reading frequently occurs embedded under a predicate of fearing or with a directive/prohibitive antecedent all of the examples (116-118) also show examples of this. Relatedly, Boogaart (2020:192*ff*) suggests (of Dutch) that it is the "sense of immediacy" of this class of adverbials that associates with notions of "urgency" and that this is the source of the "expressive nature" of subsequential TFAs. Consequently, we might hypothesise that the frequent association of sequential TFAs with these discourse contexts (situations of urgent warning) has resulted in the **conventionalisation**

of apprehensional use-conditions for *bambai* q. The selection of a subsequential TFA instead of a different epistemic adverbial in some unsettled context invites the inference that the Speaker is negatively disposed to the event described in the prejacent.

Marshalling cross-linguistic evidence of this path of change,[16] for German and Dutch respectively, an utterance *nicht jetzt, nachher!/niet nu, straks!* 'not now, later' is reported to involve a higher degree of intentionality and immediacy than the less specialised *nicht jetzt, später!/niet nu, later!* 'not now, later.' What's more, tracking the facts for *bambai* presented above, these TFAs appear to have encroached into the semantic domain of epistemic adverbials, where they are reported to encode negative speaker affect with respect to their prejacents (relative to the other members of these semantic domains.)[17,18]

Additionally, *nachher* appears to have acquired a similar semantics to *bambai*,[19] shown by its felicity in the discourse in (120) below, where, tracking ⟨*marri, bambai*⟩, *nachher* appears to have encroached into the semantic domain of *vielleicht* 'perhaps.' In these contexts, *nachher* asserts negative speaker attitude with respect to its prejacent in terms relative to neutral *vielleicht* (Hanna Weckler, p.c.).

(120) **A two-participant discourse in German**

A *ich hoffe, dass es heute nicht regnet*
I hope COMP it today NEG rain

B *warum?*
why?

$\mathbf{A}_2$ *nachher wird die Party noch abgesagt!*
nachher INCH the party *noch* cancelled

'I hope it doesn't rain today [...why?...] Then the party might be cancelled!'

$\mathbf{B}_2$ *nein, das ist nicht möglich*
no, that is not possible

$\mathbf{B}'_2$ # *nein, das wäre gut!*
no, that would.be good

$\mathbf{B}''_2$ *ja, das ist möglich aber das wäre nicht so schlimm!*
yes, that is possible but that would.be NEG so bad!

Similarly to the Kriol data, German *nachher*, a TFA encoding susbsequentiality, has developed the characteristics of an apprehensional epistemic, a likely consequence of frequent embedding in the discourse contexts discussed above. Following the literature on

[16] See also Angelo and Schultze-Berndt 2018 for these observations and insightful comments about the properties of these adverbials in Kriol and German. Related observations are made for Dutch by Boogaart (2020).

[17] Thanks to Hanna Weckler and Mireille L'Amie for discussion of German and Dutch intuitions respectively.

[18] Compare also the colloquial English expression *(and) next thing you know,* q As with the other subsequential TFAs we have seen, it appears that this adverbial tends reads less felicitously (or indeed invites an ironic reading) when q is not construed as an undesirable proposition.)

(i) *The fields dried up,* ***and the next thing you know*** *our fleet dropped from 68 drivers to six in the matter of a few months.* *[Google result]*

(ii) *The Supreme Court ruled that disabled golfer Casey Martin has a legal right to ride in a golf cart between shots at PGA Tour events. Man,* ***the next thing you know,*** *they're going to have some guy carry his clubs around for him.* [Jon Stewart]

[19] Although see Angelo and Schultze-Berndt (2018:30) for a discussion of distributional differences between these two items.

expressive content and use-conditional semantics (e.g Gutzmann 2015, Kaplan 1999, Potts 2007), it is fruitful to model the 'negative speaker attitude' component of the meaning of apprehensionals as a conventional implicature, inhabiting a second semantic "dimension"—connected to but distinct from the truth conditions set out above. The infelicity of (120$\mathbf{B}_2$)'s utterance shows that negation cannot target this component of Speaker meaning, an argument for its treatment as a non-truth-conditional, not-at-issue component of the semantics: the domain of CONVENTIONAL IMPLICATURE. The proposals of Gutzmann (2015), McCready (2010), Potts (2007) (variants of a "logic of conventional implicature" $\mathcal{L}_{CI}$) develop a formalism that conceives of the semantic information contained in a given linguistic expression as a pair of truth- and use-conditional content. Borrowing rhe informal "fraction notation" deployed by these authors, we can tease apart the asserted and implicated components of the *bambai* clause in (118) – this is given in (121).

(121) $\dfrac{S \text{ is worried about/negatively disposed to snake bites}}{S \text{ might have been about to be bitten by a snake}}$

If this mode of thinking about the speaker attitude implications of *bambai* q is on the right track, then, in addition to signalling possibility, *bambai* can be thought of as a context. In uttering *bambai* q at t in w, the Speaker has created a context just like $\langle t, w\rangle$, but one in which 'it registers that [they regard q] negatively somehow' (Potts 2007:175). I propose a formal analysis of both of these components of *bambai*'s semantics (*sc.* the asserted and the conventionally implicated content) in the following section.

2.5 A semantics for *bambai*

This section seeks to provide a semantics for Kriol *bambai* that unifies the available SUBSEQUENTIAL and APPREHENENSIONAL readings discussed above and explains how a given reading is privileged in particular linguistic contexts. In order to do this, we assume a Kratzerian treatment of modal operators (1977, 1981 *et seq.*)

2.5.1 Subsequentiality

§2.3.1 showed how Kriol has retained the temporal frame uses of *bambai* derived from 'by-and-by.' For Dowty (1979, 1982), time adverbials are taken to denote sets of sets of temporal intervals. A frame adverbial[20] then, takes a predicate and says that its instantiation is contained in a given temporal interval. Following assumptions made by Kamp (1971:238ff) and Johnson (1977:115), Dowty (1979:29ff) sees fit to appeal to a notion of truth which is relativised to an index containing two intervals of time. These roughly correspond to the notions of *reference time* and *speech time* familiar from Reichenbach (1947). I will use $t*$ and t_r to refer to each of these.

As we saw, the function of (what I have referred to as) the SUBSEQUENTIALITY class of frame adverbials is to effect the constrained forward-displacement of the reference time of their prejacents with respect to some contextually-provided reference time. (122) represents a proposal to capture this relation.

[20]The term "temporal frame adverbial" due to Bennett and Partee 2004, and equivalent to "locating adverbial" for Kamp and Reyle 1993:613)

(122) **SUBSEQUENTIAL INSTANTIATION** (intensionalised)
$\textsc{subseq}(P, t_r, w) \underset{\text{def}}{=} \exists t' : t_r \prec t' \wedge P(t')(w) \wedge \mu(t_r, t') \leq s_c$
A subsequentiality relation SUBSEQ holds between a predicate P, reference time t_r and reference world w iff the P holds in w at some time t' that follows t_r.
Additionally, it constrains the temporal distance $\mu(t_r, t')$ between reference and event time to some value below a contextually-provided standard of 'soon-ness' s_c.

maybe the t' variable should be not existentially bound?

The relation between a contextually-provided standard and measure function $\mu(t_1, t_2)$ analysis[21] builds in a truth-condition that captures variable intuitions about the falsity of a statement such as *Eve fell pregnant then shortly afterwards gave birth to a son* in some situation where the birth of Cain succeeds the pregnancy described in the antecedent clause by some contextually inappropriate length of time (*e.g.* ninety years.) An additional advantage is that, in appealing to a pragmatically retrieved standard, we allow for faultless disagreement between interlocutors, in case speaker and addressee retrieve divergent standards of soonness from the discourse context (as in (123) below).

(123) **Fry**. When will that be?
Glurmo. Soon enough.
Fry. That's not soon enough. ('Fry and the Slurm Factory', *Futurama*)

In (123), the source of the disagreement between Glurmo and Fry appears to be the contextual standard (s_c) that each of them retrieves.

In its capacity as a TFA then, *bambai* can be thought of as realising a subsequential instantiation relation, as shown in (124) below.

(124) **Lexical entry for *bambai* (TFA)**
$[\![\textit{bambai}]\!]^c \underset{\text{def}}{=} \lambda P.\textsc{subseq}(P, t_r, w)$
bambai asserts that the property described by its prejacent (P) stands in a SUBSEQ relation with a time and world provided by the discourse context.

2.5.2 'Settledness' & intensionalisation

A primary motivation for the current work is to better understand the linguistic reflex that underpins the availability of apprehensional/apprehensive-modality readings of *bambai*. The TFA treatment formalised in the subsection above fails to capture this readings, although, as I will show, provides an essential condition for understanding *bambai*'s synchronic semantics and diachronic trajectory.

In §2.3.2 above, the concept of **settledness** was introduced, as deployed by Condoravdi (2002) and otherwise well established in the literature. Thomason traces the notion of historical necessity to Aristotle and Jonathan Edwards (1984:138) (see also Kamp 1979). The notion is deployed to similar effect in Giannakidou and Mari (2018) in their modal account of the future tense. The primary intuition is that some property (be it of times or eventualities) P is settled just in case it is a fact in the evaluation world that the truth of P resolves at a given time.

[21] Given that $\mathcal{T}$ is isomorphic with $\mathbb{R}$, formally $\boldsymbol{\mu} : \wp(\mathcal{T}) \to \mathbb{R}$ represents a Lebesgue measure function that maps any interval $[t_1, t_2]$ to its length $t_2 - t_1$.

Settledness/historical necessity is normally expressed in terms of **historical alternatives**. This refers to the notion of equivalence classes ($\simeq_t \subseteq \mathcal{W} \times \mathcal{W}$ of possible worlds: those worlds which have identical 'histories' up to and including a reference time t. The properties of the *historical alternative* relation are given in (125) and, on the basis of this, a formal definition of settledness is given as (126).

(125) **Historical alternatives** $\simeq \subset \mathcal{T} \times \mathcal{W} \times \mathcal{W}$

a. $\forall t[\simeq_t$ is an equivalence relation]
All world-pairs in $\simeq_t$ (at an arbitrary time) have identical pasts up to that time. Their futures may diverge.
The relation is symmetric, transitive and reflexive (*i.e.*, an equivalence relation).

b. **monotonicity.** $\forall w, w', t, t' \big[(w \simeq_t w' \wedge t' \prec t) \rightarrow w \simeq_{t'} w'\big]$
Two worlds that are historical alternatives at t are historical alternatives at all preceding times t'.
That is, they can only differ with respect to their futures.

(Thomason 1984:146)

(126) **Settledness for P.**
$\forall w' : w' \in cg, \forall w'' : w' \simeq_{t_0} w'' :$
$AT\big([t_0, \_), w', P\big) \leftrightarrow AT\big([t_0, \_), w'', P\big)$ (Condoravdi 2002:82)

A property P (*e.g.* an eventuality) is settled in a reference world w' iff P holds at a reference time t_0 in all of w''s historical alternatives w'' as calculated at t_0.[22]

Here, I defend a claim that the modalised meaning component of apprehensional readings of *bambai* arise in part (*i.e.*, Lichtenberk's *epistemic downtoning* — the 'epistemic' component of APPR markers) due to the conventionalisation of an R-based implicature that the Speaker is making a modalised claim when they make any predication that is epistemically unsettled. Given Horn's $\mathcal{R}$-principle "SAY NO MORE THAN YOU MUST" (1984:13), an utterance of *bambai* P licenses the (speaker-based) implicature that the Speaker is basing a predication (particularly an premonitory one, cf. § 2.4) about some unsettled eventuality on its possible truth in view of (perceived compatibility with) a the set of facts that they know of the world. The locus of this implicature is that the Speaker can rely on her hearer's knowledge of the world to reason that an unsettled subsequentiality predication has the valence of a prediction.

Appealing to a Kratzerian framework, we can modalise our entry for *bambai* in order to capture the "epistemic downtoning" effect associated with apprehensionals. A principal component (and advantage) of Kratzer's treatment of modals (1977, 1981, 2012) lies in the claim that the interpretation of modalised propositions relies on 'conversational backgrounds': that they quantify over sets of worlds retrieved by an 'accessibility relation' which is *contextually* made available. The entry in (127) proposes a unified, modalised semantics for *bambai*.

[22] The AT relation holds between a time, world and an eventive property iff $\exists e[P(w)(e) \& \tau(e, w) \subseteq t]$ — *i.e.* if the event's runtime is a subinterval of t in w (Condoravdi 2002:70). This can accomodate stative and temporal properties with minor adjustments (see *ibid.*). For the sake of perpescuity, I abstract away from (davidsonian) event variables in this section.

(127) $[\![\textit{bambai}]\!]^c = \lambda m \lambda o \lambda P. \exists w' \big[w' \in \textbf{best}_{o(w)}(m, t*, w*) \wedge \textsc{subseq}(P, t_r, w') \big]$
bambai asserts that there exists some world w' in a set of worlds that are optimal with respect to a contextually-determined modal base m and ordering source o in the reference context $c = \langle t*, t_r, w* \rangle$. It additionally asserts that the SUBSEQUENTIAL INSTANTIATION relation (as defined in (122) above) holds between that world w', the prejacent P, and a reference time provided by the utterance context t_r.

With the entry in (127), we can formalise the intuition that, when (and only when) *bambai* p is understood as making a nonfactual predication, it constitutes a prediction of a possible — but unverified or (presently) unverifiable — state-of-affairs. Spelled out below, the availability of multiple readings to *bambai*-sentences is modelled as compatibility with a range of conversational backgrounds (*cf.* Kratzer 2012:55*ff*).

2.5.2.1 Deriving the subsequential reading

The so-called subsequential TFA use of *bambai* follows from general norms of assertion: given that the speaker is predicating about a settled property, her context set is understood as veridical and the assertion is taken to be factual (*cf.* the (super)maxim of quality: "try to make your contribution one that is true" (Grice 1991:27)).

In these cases the intensional contribution of *bambai* can be captured by claiming that it quantifies (trivially) over a *metaphysical* modal base and an empty ordering source (see Kratzer 2012).)[23]

(128) **A veridical conversational background: *bambai*'s subsequential reading**

a. $\bigcap m_{\text{meta}}(w)(t) = \{w' \mid w' \simeq_t w\}$
A metaphysical modal base m_{meta} retrieves the set of propositions that are **consistent** with a world w at a given time t.
Consequently, the intersection of these propositions returns the set of **historical alternatives** to w at the given evaluation time t.

b. $o_{\text{empty}}(w) = \varnothing$
An empty ordering source o_{empty} contains no content (propositions) and hence induces no ordering over the modal base.

c. Because the ordering source is empty, the function $\textbf{\textit{best}}_{\varnothing}(m_{\text{meta}}, t, w)$ simply returns $\bigcap\limits_{\text{meta}} m(w)$: a set of worlds which are historical alternatives to w at t.

Given that, by the definition in (125), historical alternatives have "identical pasts" to one another, in factual, past-tensed contexts, the metaphysical modal base over which *bambai* quantifies (trivially) are identical to the evaluation world. This is derived for (129) below (the sentence simplified from (92) above)

(129) **Deriving the subsequential reading**
main dedi bin go la det shop, ***bambai*** *im=in gugum dina*
my father PST go LOC the shop ***bambai*** 3S=PST cook dinner

'My dad went to the shop, **then** he made lunch' [AJ 23022017]

[23] In her treatment of Marathi present tense marking, Deo (2017) makes similar appeal to veridical vs. non-veridical conversational backgrounds to capture ostensible polysemy associated with these (present-tense) forms.

a. **Taking *bin* 'PAST' to restrict t to before speech time $t*$**
$[\![bin]\!]^c = \text{PST} = \lambda t : t \prec t*.t$
bin is an partial identity function from times to times, defined only if a given (reference) time precedes speech time

b. **Meaning of the first clause**

$$[\![\textit{main dedi go la det shop}]\!](\text{PST}) = \lambda t \lambda w.\text{GO.SHOPPING}(t)(w)$$
$$= \lambda w : t \prec t* .\text{GO.SHOPPING}(t)(w)$$

Defined only if $t' \prec t*$, the first clause asserts that the event of Dad's trip to the shop occurs at a contextually-retrieved time t'.

c. **Meaning of the second clause (*bambai*'s prejacent)**
$[\![\textit{im gugum dina}]\!]^c(\text{PST}) =: t'' \prec t*.\text{MAKE.LUNCH}(t'')(w)$

d. **Meaning of *bambai* & substitution of meaning of (c) for λP**

$$[\![\textit{bambai}]\!]^c = \lambda m \lambda o \lambda P.\exists w' \big[w' \in \textbf{best}_{o(w)}(m, t, w) \wedge \text{SUBSEQINST}(P, t_r, w')\big]$$
$$[\![\textit{bambai imin gugum dina}]\!]^c = \lambda m \lambda o : t'' \prec t*.\exists w' \big[w' \in \textbf{best}_o(m, t_r, w*)$$
$$\wedge \text{SUBSEQINST}\Big(\big(\text{MAKE.LUNCH}(t'')(w)\big), t_r, w\Big)\big]$$

e. **substitution of conversational backgrounds m, o**

$$[\![\textit{bambai imin gugum dina}]\!]^c =: t'' \prec t* .\exists w' \big[w' \in \textbf{best}_\varnothing(m_{\text{meta}}, t_r, w*)$$
$$\wedge \text{SUBSEQINST}\Big(\big(\text{MAKE.LUNCH}(t'')(w)\big), t_r, w\Big)\big]$$

Given that MAKE.LUNCH is instantiated prior to speech time $t*$, the modal component of *bambai* involves quantifying over a veridical conversational background, *sc.* $\{w' \mid w' \simeq_{t*} w*\}$ (*per* general pragmatic principles/assertoric norms, *e.g.*, Grice's quality maxim.)
MAKE.LUNCH is in the SUBSEQ relation with t_r in w' in a historical alternative$_{t*}$ to $w*$.

really don't know what to
ut in an index and what to
mbda-bind and what if any
ff preds this makes. what's
ear is that $t \neq t_r$

f. **Spelling out the SUBSEQUENTIAL INSTANTIATION relation (cf. 122)**

$$[\![\textit{bambai imin gugum dina}]\!]^c =: t'' \prec t_r.\exists w' \big[w' \in \textbf{best}_\varnothing(m_{\text{meta}}, t*, w*)$$
$$\wedge \exists t''[t_r \prec t'' \wedge \text{MAKE.LUNCH}(t'')(w') \wedge \mu(t_r, t'') \leq s_c]\big]$$

The SUBSEQ component of *bambai*'s meaning further restricts the instantiation time (t'') of MAKE.LUNCH: it asserts • that a contextually-retrieved reference time t_r precedes t'' and • that the temporal distance between those two times is below some contextual standard ("soonness").

Note that, in (129f), it is exactly the same mechanism responsible for establishing the interclausal anaphoric relation between *im* and *main dedi* is responsible for the the equation of t_r with SHOPPING-time $(\lambda t.\text{GO SHOPPING}(t))$. In Kampian (discourse representation theoretic) terms (1993:Ch. 5) (also adopted in, *e.g.* Partee 1984) a new time referent has been introduced into the discourse by the first clause, which is accessible from the second,

where it is equated with the reference time t_r.

2.5.2.2 Deriving the apprehensional reading

In unsettled contexts, *bambai* selects for a nonfactual/nonveridical modal base (whether epistemic or metaphysical) and a stereotypical ordering source. These backgrounds are formalised in (130), adapting liberally from (Kratzer 2012:37-40 i.a.)

(130) **conversational background: *bambai*'s modal-apprehensional reading**

a. $\bigcap_{\text{meta}} m(w)(t) = \{w' \mid w' \simeq_t w\}$
(As above) a metaphysical modal base m_{meta} is a function that retrieves the set of historical alternatives to w at t.

b. $o_{\text{s'typ}}(w) = \{p \mid p$ will hold in the 'normal' course of events in $w\}$.
A sterotypical ordering source is a set of propositions that can be taken to hold in the "normal course of events" (Kratzer 1981:295).

c. $o_{s'typ}(w)$ then induces an ordering $\leqslant_{o_S(w)}$ on the modal base:
$\forall w', w'' \in \bigcap f_{\text{epist}}(w)(t) : w' \leqslant_{\boldsymbol{g(w)}} w'' \leftrightarrow \{p : p \in g(w) \wedge'' \in p\} \subseteq \{p : p \in g(w) \wedge w' \in p\}$
For any worlds w' and w'', w' is 'at least as close to an ideal' than w'' with respect to $_{\text{s'typ}}(w)$ (*i.e.* it is at least as close 'normal course of events') if all the propositions of $o(w)$ true in w'' are also true in w'.

d. ***Best***$(m_{\text{meta}}, o_{\text{s'typ}}, t, w)$ then returns just that subset of historical alternatives to $w*$ that are closest to what might be judged as a "normally-unfolding course of events" in $w*$.

've written to cleo and have a number of hings to work out/add on the choice of epistemic modal base, especially given the pparent problems this will pose for counterfactuals. This draws largely from Giannakidou and Mari (2018), while trying to harmonise this with observations made at the end of Condoravdi (2002) (21feb email exch.)

We can now derive the proper semantics for a "precautioning" use of *bambai*, as in (93), repeated here as (131).

(131) **Deriving the apprehensional reading**
ai=rra dringgi kofi ***bambai*** *mi gurrumuk (la desk iya gin)*
1S=IRR drink coffee *bambai* 1s fall.asleep LOC desk here EMPH

'I'd better have a coffee otherwise I might pass out (right here on the desk)'[GT 28052016]

a. ***(ga)rra* as a necessity modal**
(adapted from the semantics forr WOLL cited in Condoravdi 2002:71)[24]
Given a modal base m, ordering source o and an evaluation time & world $t*, w*$:

$$[\![\textit{garra}]\!] = \lambda P \forall w' \big[w' \in \text{BEST}_o(m, w*, t*) \rightarrow \text{AT}\big((t*, \infty], w', P\big)\big]$$

garra takes a predicate P and says that P holds in the future of t of all best-according-to-*o* worlds in the modal base.

b. **Meaning of the first clause**

[24] A satisfactory analysis of the semantics of *garra* (glossed here as 'IRR') is beyond the scope of this work. It is treated by Schultze-Berndt et al. (ms) as polysemous between a future and "obligation" marker, although I have also elicited tentative evidence of epistemic necessity readings. Abstracting away from these questions of modal flavour, it is treated here as a necessity modal and glossed sas IRR.

$[\![\textit{airra dringgi kofi}]\!] = \forall w'\big[w' \in \textsc{best}_o(m, w*, t*) \rightarrow \textsc{at}\big((t*, \infty], w', \textsc{drink.coffee}\big)\big]$

c. **meaning of the second clause**
$[\![\textit{mi gurrumuk}]\!]^c = \lambda t \lambda w.\textsc{pass.out}(t)(w)$

d. **Meaning of *bambai* & substitution of meaning of (c) for λP**

$$[\![\textit{bambai}]\!]^c = \lambda m \lambda o \lambda P.\exists w'\big[w' \in \textbf{best}_{o(w)}(m, t, w) \wedge \textsc{subseqInst}(P, t_r, w')\big]$$

$$[\![\textit{bambai mi gurrumuk}]\!]^c = \lambda m \lambda o.\exists w'[w' \in \textbf{best}_o(m, t, w) \wedge \textsc{subseq}(\textsc{pass.out}, t_r, w')]$$

e. **substitution of conversational backgrounds m, o**

$$[\![\textit{bambai mi gurrumuk}]\!]^c = \exists w'\big[w' \in \textbf{best}_{\mathcal{S}}(m_{\text{meta}}, t*, w*) \wedge \textsc{subseqInst}\big(\textsc{pass.out}, t_r, w\big)\big]$$

In this instance, where the reference time retrieved from context is in the **future of speech time** (i.e. some time in an interval following speech time — $t_r \in (t*, \infty]$), the modal base m is **diverse with respect to the SUBSEQ property** — that is, the property $\textsc{subseq}\big([\lambda t' \lambda w.\textsc{pass.out}(t')(w)], t_r, w\big)$ is **not settled in $w*$**.

f. **Spelling out the SUBSEQUENTIAL INSTANTIATION relation (cf. 122)**

$$[\![\textit{bambai mi gurrumuk}]\!]^c = \exists w'\big[w' \in \textbf{best}_{\mathcal{S}}(m_{\text{meta}}, t*, w*) \wedge \exists t'[\textsc{pass.out}(t')(w') \wedge \mu(t_r, t') \leq s_c]\big]$$

The SUBSEQ component of *bambai*'s meaning asserts the instantiation of PASS.OUT at some time (t'). t' is preceded by a contextually-retrieved reference time t_r: • t_r is identified as some time in the interval $[t*, \infty)$ (i.e. the instantiation time of DRINK.COFFEE) and • the temporal distance between those two times is below some contextual standard ("soonness").

The crucial difference then, that distinguishes the pure (actualised) subsequential reading from the apprehensional one is that the property described by the prejacent is **settled by $t*$ in $w*$** — that is, in all historical alternatives to the evaluation world, the event described by MAKE.LUNCH in (129) holds. Conversely, the context **fails to satisfy** settledness for PASS.OUT in (131). As claimed in (e), it satisfies the *diversity condition* (Condoravdi 2002:83):

(132) **Diversity condition w/r/t prejacent in (131)**
$\exists w', w'' \in \cup \simeq_{t*} w* : \textsc{at}\big((t*, \infty], w', \textsc{pass.out}\big) \wedge \neg\textsc{at}\big((t*, \infty], w'', \textsc{pass.out}\big)$
There are metaphysical alternatives to $w*$ at $t*$ where the event described by the prejacent to *bambai* in (131) holds and others where it doesn't hold.

the omniscience restriction. Crucially, in the apprehensional cases presented above, those where predications about unsettled states of affairs timeline has been triggered (per-

haps by one of the operators presented in Table 2.2 (*p.*58 above)), modalisation with respect to a non-settled property cannot reasonably select for the set of conversational backgrounds presented in (130). Such an operation would require the participants to be able to retrieve all propositions that are true in and characteristic of worlds with respect to a vantage point in the future or to be able to calculate all the ramifying consequences of eventualities that might have obtained in the past (in the case of counterfactual uses.)

This condition allows us to unify the modalised and non-modalised readings of *bambai*: iff utterance context satisfies the diversity condition, the modal reading "emerges."

2.5.3 Use conditions

In §2.4, we saw how (along with the illocutionary "downtowning" analysed immediately above), the expressive content of *bambai* appears to be a result of frequent occurrence of *bambai* (and similar subsequential TFAs) in contexts of "preacautioning" and fearing. In these cases, *bambai* behaves as a discourse anaphor: a connective whose truth-conditional contribution is asserting that the eventuality described in its prejacent obtains subsequently to a contextually salient time made available in the discourse context.

In that section I additionally provided data from other languages where a subsequential TFA appears to have undergone similar functional change, developing apprehensional expressive content. German *nachher* is one such item. In (120), we saw how the expressive content of *nachher* appears to be not-at-issue: Pott's "nondisplaceability" criterion for identifying use-conditional semantic content.

Gutzmann (2015) proposes a compositional "hybrid semantics" that is capable of handling these "two dimensions" of meaning — *viz.* distinct truth- and use-conditional content. On this type of account, the semantics of a lexical item like *bambai* might be modelled as a "mixed use-conditional item." The previous section discussed the truth-conditional contribution of *bambai*, providing the lexical entry in (127) above. Following the proposal in Kaplan (1999)whee a "use-conditonal proposition" is understood to denote a set of contexts, Gutzmann (2015, following a suggestion in Portner 2007) appeals to a model with parallel types, interpretation functions and composition rules for both truth- and use-conditions that allow for the interaction of these condition types while distinguishing these two "dimensions" of meaning.

The use-conditional contribution of *bambai* (as suggested in §2.4) can then be informally stated as (133).[25]

(133) $[\![\textit{bambai}\ p]\!]^u = \{c : c_s \text{ is negatively disposed to } p \text{ in } c_W\}$
bambai p is expressively correct in a context where the speaker c_s is negatively disposed to p in $w*$

In this case, *bambai* p can be taken to conventionally implicate a proposition of the form given in (133), in addition to the asserted/truth conditional content presented in the above subsections.

[25]This use condition is comparable to the condition proposed by AnderBois and Dąbkowski (2020): $\forall w' \in \textsc{goal}_{i,p}(w) : \neg q(w')$ (I.e. that some proposition p is performed/caused by i in order to achieve the speaker's goals (in which $\neg q$ holds))

2.5.4 The antecedent p: restriction and partition

We have seen throughout that *bambai* can give rise to readings of implicational relations between the two propositions. §2.5.2 defended an analysis of *bambai* that claims that the TFA and modal uses emerge follow from reasoning about the speaker's information state with respect to the realisation (*sc.* settledness) of the predicate it modifies. The following discussion sketches a way to reconcile these observations.

As discussed in some detail in Chapter 1, a fruitful way of conceiving of conditionals is as a type of modality, where the quantificational domain of the modal is explictly restricted. This is achieved by intersecting a (contextually-retrieved) modal base with a proposition (*viz.* that proposition denoted by the conditional antecedent) (Kratzer 2012, von Fintel 1994).

The "precautioning" uses described here (*i.e.*, those of the form p *bambai* q are interpreted as introducing an eventuality which is a possible consequence of the antecedent subject's failure to attend to some situation which is described in the antecedent clause (roughly $\neg p(w) \rightarrow \blacklozenge q(w)$). In other words, these uses of *bambai* strongly resemble those of *otherwise*, as described in Ch. 1 (with the addition of apprehensional expressive content and apparent differences in modal force).

For the now-familiar example in (93 [=103]) above, as shown above, the presence of *garra* in the antecedent clause triggers an unsettled predication, yielding an apprehensional reading of the *bambai* clause. *bambai* merges with an anaphoric proposition (which is linguistically overt in the current example but need not be), taking its complement as a restrictor to the modal base (yielding m^+ to borrow Kratzer's (1981) notation). The denotation for (93) is given in (134) below.

his analysis has in part een superseded by Phillips nd Kotek-ms, which eploys a modal ubordination approach to nderstand the relation etween p and q. What is ear is that the **bambai** ause is **not** syntactically ubordinate to **p**.

(134) $[\![\textit{bambai mi gurrumuk}]\!]^c =$

$$\exists w' \in \text{BEST}_o(m^+, t, w) \wedge \text{subseq}(\textsc{pass.out}, t, w')$$

Where $m^+ = \{w' \mid w' \in \bigcap(m_{meta}(w) \cup \textsc{drink.coffee}\}$

The treatment as described in the current subsection is not, however, complete. A problem persists in understanding the relationship that the overt linguistic clausal antecedent bears to the proposition on which *bambai* is anaphoric. It is plainly not, for example, the case that the complement of *airra dringgi kofi* 'I must drink coffee', is the proposition on which provides the restriction on the conversational background that is being quantified over. Such a treatment would incorrectly yield an interpretation truth-conditionally identical to: 'I will fall asleep if it is not the case that I must drink coffee.' This particular question may be solvable by adopting a modal subordination approach following Roberts 1989 *et seq.*

Similarly, as discussed in §2.3.2.2, with *if...bambai* constructions, there appears to be no additional operation performed upon the *if*-marked antecedent — that is, the *if*-marked antecedent predicate is precisely the proposition upon which *bambai* is anaphoric.

These remaining questions — about the relation between the syntactic antecedent and the antecedent proposition which is responsible for anaphorically partitioning the modal base in order to yield the 'nonimplicational' readings of apprehensional *bambai* — are a remarkable linguistic phenomenon in and of themselves and a fertile domain for ongoing research. The analysis presented in this section takes the restricted modal base that is an outcome of this process and compositionally derives the proper semantics for *bambai* and its relationship with its prejacent.

2.6 Conclusion

This paper has proposed a formal account for the emergence of apprehensional epistemic markers from temporal frame adverbs, based on the central descriptive observation of Angelo and Schultze-Berndt (2016). It shows the potential of formal semantic machinery for better understanding the conceptual mechansims that underpin meaning change (in the spirit of much the emergent tradition appraised in Deo 2015) as applied to the modal domain. Further work may additionally extend the formal treatment of the expressive component of apprehensional (and other apparently use-conditional) items.

It has attempted to elucidate the mechanisms through which frame adverbs that originally encode a relation of temporal sequency come to encode causality, possility and speaker apprehension by way of the generalisation and conventionalisation of implicatures. The existence of this 'pathway' of grammaticalisation provides further evidence of the conceptual unity of these linguistic categories and sheds light on the encoding of (and relationship between) tense and modality in human language. Of particular note is the salient role played by 'settledness' (*cf.* Condoravdi 2002 a.o.) in adjudicating the available readings of relative tense operators (here exemplified in subsequential' TFAs.)

Additionally, an apparent cross-linguistic relationship between subsequentiality and the semanticisation of apprehensional use-conditions may have implications for our understanding of the development of linguistic markers which express speaker attitudes.

An open issue that demands further consideration is that of better understanding the relation between the proposition on which the *bambai* clause is anaphoric and which is interpreted as the restrictor of the modal base in apprehensional contexts and the antecedent clause to which it is syntactically linked. A satisfying answer to this question likely lies at the semantics-pragmatics interface. A successful analysis may have ranging implications for understanding the interplay of factors that contribute to the proper interpretation of discourse anaphors.

Chapter 3

Semantics of the Negative Existential Cycle

3.1 Introduction

This chapter brings the observations of the 'negative existential cycle' (see Croft 1991, Veselinova 2013, 2016, this volume among others.) to bear in the context of the Aboriginal languages of Australia. The Australian language ecology is a fertile area for comparative typological work, given its striking linguistic diversity and small, non-sedentary, frequently exogamous populations (Bowern 2010). Some 90% ($N \approx 290$) of the languages spoken on the Australian mainland have been reconstructed to the Pama-Nyungan family (see also Bowern and Atkinson 2012, **?**, **?**), with a common ancestor spoken in Northern Australia almost 6,000 years before present (Bouckaert et al. 2018).

Taking the negative domains of three Pama-Nyungan subgroups as an empirical testing ground, this chapter describes the relationship between so-called 'standard' (SN) and 'existential' negation in an investigation of predictions made by a postulated cyclic change: the Negative Existential Cycle (NEC). Here, explicit markers of existential negation[1] emerge (stage $A \rightarrow B$), encroach into the semantic domain of an erstwhile general negative marker (stage $B \rightarrow C$), and finally displace the latter, becoming a standard negation marker without the formal or functional features of an existential negator (stage $C \rightarrow A$; see Croft 1991, Veselinova 2016 a.o.) The Pama-Nyungan data provided here give further evidence for the cross-linguistic validity of the NEC, although, we will also see evidence of contact-induced change in the negative domains of some languages which are not clearly captured by the Cycle.

This chapter is organised as follows: Section 3.2 provides an overview of typological generalisations that can be made of negation marking in Australian languages with particular attention paid to the semantics of the category of the so-called "privative case." Section 3.3 investigates evidence of change, replacement and renewal of negative markers in the Thura-Yura language group of South Australia. Section 3.4 compares the negative domains of three Yolŋu languages, particularly evidence of expansion in the domain of pri-

[1]For the purposes of this paper, similarly to others in the current volume, "existential negation" is understood as a linguistic strategy for predicating the *absence* of some entity at a certain location (adapting from Criessels' (2014:2) typology of existential constructions, consonant with the approach taken in Veselinova 2013:139. McNally also points out the relevance of "noncanonical sentence types", distinguished syntactically or lexically, serving to 'introduce the presence or existence of some individual(s)' (2016:210). See also Freeze 1992 for an analysis that explicitly relates existential to LOCATIVE and POSSESSIVE predications.

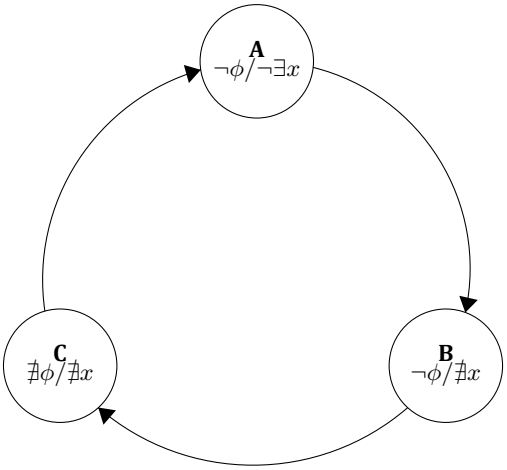


Figure 3.1. The 'Negative Existential cycle' — a typology of standard & existential negation according to the analyticity of these markers (Croft 1991, see also Veselinova 2016.) Standard negators $\neg$ are used to negate both verbal ϕ and existential $\exists$ predicates in stage A, a suppletive 'negative existential' $\nexists$ arises in stage B and this marker comes to mark standard negation in stage C. 'Transitional' stages are assumed to occur between each of the labelled stages.

vative marking in a number of varieties. Section 3.5 describes standard negation in Upper Arrernte, situating arguments made elsewhere in the literature (particularly **?**) that, in this language (and related Arandic varieties), synchronic SN strategies are a result of reanalysis of an erstwhile nominal suffix. Ultimately, a primary upshot of this comparative work trades on an insight, only briefly discussed in work on the NEC (e.g. Croft 1991:17), that this process (at least insofar as it is actualised in these Australian languages) can largely be understood and predicted with reference to existing work on semantic change (*sc.* diachronic developments in the meaning of a given lexical item) and work that formally seeks to generalise over grammaticalisation pathways and cycles (e.g. Deo 2015a,b, **?**).[2] This is discussed in Section 3.6.

3.2 Negation & Australia: a typological snapshot

Strategies that natural languages deploy to mark negation have long attracted the attention of philosophers and linguists (see Horn 1989 for a comprehensive investigation of these questions). More recent work (e.g. Miestamo 2005 a.o.) seeks to propose a typology for the behavior of 'standard negation' marking strategies across a sample of world languages (including 40 Australian varieties.) *Standard negation* (SN) is understood as those language-specific mechanisms whose function is the inversion of the truth value of a proposition associated with a given (declarative) clause. Drawing a distinction between SN and 'special negation' is warranted in view of the empirical fact that many languages have distinct formal mechanisms for the negation of nonverbal (e.g. copular, existential) predications, imperatives and other types of 'subclausal' negation (Horn and Wansing 2017, Miestamo 2007, van der Auwera and Lejeune 2013, Veselinova 2013).

[2] See also the distinction drawn between "functional" and "formal" cycles as applied to the Jespersen's cycle in **?**.

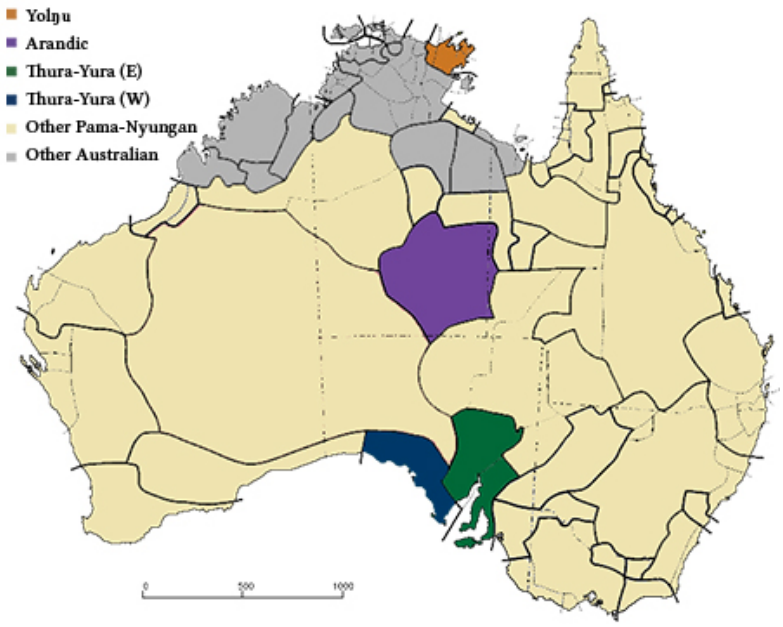


Figure 3.2. Subgrouping of Australian languages. Pama-Nyungan family in tan, with Yolŋu subgroup given in ochre, Arandic in purple and Thura-Yura divided into green (Eastern varieties) and blue (Western/Nangga varieties.)

Some 300 Australian languages have been reconstructed to a single family, Pama-Nyungan, spoken across Australia except for some regions in the north of the continent. The most recent common ancestor of these languages is esimated to have been spoken roughly five to six thousand years BP (a similar timedepth to Indo-European, see Bouckaert et al. 2018:742). Many of these languages remain underdescribed, and consequently, typological and comparative work detailing the expression of negation across Australian languages is underdeveloped. Exceptions to this include Dixon 2002 and **?** (forthcoming), surveys that have turned up some generalisations about the formal and functional expression of negation in these languages. Based on the insights of these works, we might divide the 'negative semantic space' so to distinguish four macro-categories of negator: (1) negative imperatives/prohibitives, (2) clausal/standard negators and (3) nominal negators, including specialised negative existentials and a commonly occurring 'privative' category, and (4) negative interjections. There is a substantial amount of variation in the formal exponence of each of these functions, some varieties distinguishing all four categories (e.g. Bidjara [bym]), some with a single syncretic marker for all four (e.g. Dyirbal [dbl], according to Dixon 2002:84–table 3.3).

An exceptionful (but otherwise fairly robust) formal tendency across Australian languages is for clausal negation to be marked with a particle pre-verbally and for privative case to be encoded as a nominal suffix. We will explore the implications of this generalisation and its exceptions below. The remainder of this section constitutes a brief survey the exponence of negation strategies in Australian languages, partially summarising insights from **?** (forthcoming).

3.2.1 "Standard" negation

This section briefly provides some generalisations about clausal negation strategies in Australian languages. For a more comprehensive discussion of exceptions and significant interactions between SN and other aspects of the verbal complex in Australian languages, the reader is referred to **?** (forthcoming).

Dixon (2002:82) claims that "almost every Australian language marks 'not' by a non-inflecting particle which goes before the verb." He notes that this generalisation extends also to the most synthetic non-Pama-Nyungan languages spoken in the north of the continent. Negation in the Arandic subgroup of Pama-Nyungan, which provides a major exception to this formal generalisation, and is particularly relevant for current purposes, is discussed in more detail in §3.5. The data from Ngiyambaa ([wyb] Pama-Nyungan: Wiradhuric) below clearly demonstrate this generalisation with the preverbal SN particle *waŋaːy*, which has scope over the entire sentence in (a) and just the second predicate in (b).

(135) *Preverbal standard negation in Ngiyambaa* (Donaldson 1980:239)

a. ***Waŋaːy*** *yiŋgalaː-dhi=dju=na* *girimiyi-la.*
NEG same-CIRC=1.NOM=3.ABS wake.PST-THEN

'It wasn't because of that I woke her then.'

b. *Yiŋgalaː-dhi=dju=na* ***waŋaːy*** *girimiyi-la.*
same-CIRC=1.NOM=3.ABS **NEG** wake.PST-THEN

'Because of that I didn't wake her then.'

3.2.2 The "privative case" and existential predications

The privative case (PRIV) is a very robustly attested category in Australian languages.[3] Broadly speaking, it predicates the absence of some property denoted by the noun that it associates with, although the precise semantic domain of this category varies considerably across languages (*cf.* arguments for the predicative status of negative existential markers in Veselinova 2013:139). In Nyangumarta ([nna] Pama-Nyungan: Marrngu), for example, *-majirri* 'PRIV' can be used to predicate absence (*i.e.* as a negative existential, see (136a)). Muruwari ([zmu] Pama-Nyungan: SE) similarly makes use of a form *-kil~-til~-tjil*, shown in (136b-c).[4] PRIV case markers are frequently antonymous to another case suffix, frequently occurring in Australian languages, usually glossed as the comitative (COMIT), proprietive (PROP) or '*having*' case. Uses of this marker are given in (137). The apparent synonymy of (136b) and (137b) show the antonymous relation between comitative and privative predications.

(136) *Negative existential function of PRIV*

[3] Morphological cases with similar semantics are referred to as *abessive* and/or *caritive* in other literatures (*e.g.* for Uralic in Hamari 2011, 2015, Tamm 2015). 'Privative' is ubiquitous in Australian language description and will be used here throughout.

[4] Oates (1988:77) describes this suffix as the ABESSIVE: "the opposite of the comitative in that it signifies 'lacking' or 'being without' some person of thing.' She glosses it throughout as 'lacking.'

a. *mungka-**majirri** karru-**majirri**-pa paru-**majirri** jungka jalu-ny* [Nyangumarta]
tree-**PRIV** stream-**PRIV**-CONJ spinifex-**PRIV** ground only

'There were no trees, creeks, or spinifex; only the ground (in that country.)' (**?**:140)

b. *palanj mathan-**kil*** [Muruwari]
nothing stick-**PRIV**

'(There are no) sticks [...nothing]' (Oates 1988:77)

c. *ngapa-**kil**-pu-n* [Muruwari]
water-**PRIV**-3.SG-NMLZR

'He has no water.' (lit. 'he-waterless') (Oates 1988:78)

(137) *Existential function of COMIT*

a. *thuu kuya-**yita** wartu* [Muruwari]
much fish-**COMIT** hole.ABS

'The river has a lot of fish in it.' (=There's a lot of fish in the river) (Oates 1988:73)

b. *wala mathan-pira* [Muruwari]
NEG limb-**COMIT**

'(There are) no sticks.' (Oates 1988:74)

Australian languages have a number of strategies to express existential and non-existence (absence) predications. (136a) shows the Nyangumarta privative marker functioning as an existential negator: it predicates the absence of trees, streams and spinifex (a culturally important tussock grass) of a particular location. Additionally, *contra* a prediction made by Croft (1991:19), there are many Australian languages for which it is the case that "an existential sentence [can] consist solely of the noun phrase whose existence is predicated." An example of bare NP existential predication is also given in (136a), where the existence of *jungka* '[bare] ground' is predicated.[5] These facts immediately present a challenge to the (formal) negative existential cycle as formulated: if existence predicates are frequently verbless, there is no way to formally distinguish between stages **A** and **C** on the basis of synchronic data. I know of no Australian language with a *reserved* existential verb; like copular clauses, existence predications appear to frequently make use of a stance or motion verb (most frequently one that primarily means 'sit' or 'lie' and often polysemous with 'stay, live'), or are otherwise verbless.[6]

Relevantly for current purposes, the semantics of the privative suffix can be instructively captured by adapting existing analyses of existential propositions (e.g. Francez 2007, McNally 2011). These analyses generally characterise existential predication as comprising **obligatorily** some (type of) entity whose existence is being predicated (the PIVOT) and

[5]Such constructions have also been reported elsewhere in the literature, e.g. for Māori [mao] where "'existence" statements have no copula or existence verbs' (Bauer 1993:78, cited by Chung and Ladusaw 2004 a.o). Similarly, sign languages tend to allow bare-NP existential predication (see de Weert 2016:26ff on Flemish and Finnish sign languages.). Even Marra [mec] (a language cited in Croft 1991:14) appears to permit bare NP existentials, if Heath's (1981:364) translations are to be trusted.

[6]Notable, however, is the fact that these stance/motion verbs often lend particular semantic nuances to the copular and existential predications in which they participate (see e.g. Wilkinson 2012:610-611).

some **optional** restriction (perhaps locative) on its existence (the CODA; see Francez 2007). Adapting Francez's analysis would mean treating privative noun phrases as generalised quantifiers of nonexistence. This is consonant with Croft's (1991:18) observation about the privileged status of existential predication (as a logical quantifier as opposed to the one-place predicates of other stative verbs), which forms the basis for a functionalist explanation of the 'constant renewal' of negative existentials at stage B of the NEC (see also Veselinova 2016:173). A truth-conditional analysis of one privative-marked noun from (136a) is provided in (138) below; each step is spelled out in prose.

(138) a. *mungka-majirri*
tree-PRIV

b. **no** $= \lambda P_{\langle e,t\rangle} \lambda Q_{\langle e,t\rangle} . P \cap Q = \varnothing$ (e.g. Barwise and Cooper 1981:169)
The function **no** takes two properties P, Q and returns a 'true' if there is nothing in the domain which is in the intersection of those two sets.

c. $[\![$*mungka-majirri*$]\!] = \lambda P_{\langle e,t\rangle} \big[\mathbf{no}(\lambda x[\mathbf{Tree}(x)], P)\big]$
The privative-marked NP *mungka-majirri* 'tree-PRIV' is a generalised quantifier: it states that there exists nothing in the domain in the intersection of the set of trees $(\lambda x.\mathbf{Tree}(x))$ and some other property that is provided by the context of utterance (*sc.* Francez's *contextual domain* d_α (2011:1838)).

d. $[\![$*mungka-majirri*$]\!]^c = \mathbf{no}(\lambda x[\mathbf{Tree}(x)], \lambda y[\mathbf{loc}(st_c, y)])$
In the absence of an explicit/linguistically-encoded "coda" (i.e. locus/restrictor) for the privative (i.e. a 'subject' NP of whom the privative-property is being predicated), the context of utterance provides an additional restriction as the second argument to **no**. This restriction may take the form of a function that returns a set of things related to some spatiotemporal parameters indicated by context [*viz.* the contextually salient place and time being predicated about, some particular 'country' in the past according to Sharp's translation]. $d_{st_c} = \lambda y_e . R(\text{'that country'}, y)$

If we treat privative marking on NPs as a type of negative existential predicate, a consequence of the NEC is the prediction that these markers ought to eventually generalise, displacing an erstwhile standard negator (i.e. PRIV markers will participate in the NEC.) Phonological identity between privatives and SN is indeed well-attested in Australia (e.g. Bardi [bcj] (Bowern 2012) and Warrongo [wrg] (Tsunoda 2011).) In these languages, negative existential/privative predication may be syntactically distinguished from standard clausal negation by placing the general NEG particle post-nominally instead of preverbally (see 139, 140a–b) below.) A possible example of a postnominal existential negator acquiring the function of clause-initial standard negator is found in Wirangu ([wgu] Pama-Nyungan: Thura-Yura). This case is described in section 3.3 below along with a discussion of its potential import for theories of the NEC.

(139) Negation in Warrongo ([wgu] Pama-Nyungan: Maric)

a. Senential negation with initial *nyawa* 'NEG'

nyawa	*ngaya*	*balga-lgo*	*banjo-lgo.*
NEG	1.SG.ERG	hit-PURP	ask-PURP

'I will not hit [him]. [I] will ask [him].' (Tsunoda 2011:363)

b. Existential negation with postnominal *nyawa* 'NEG'

nyawa, yarro walwa yamba.
NEG this bad country.

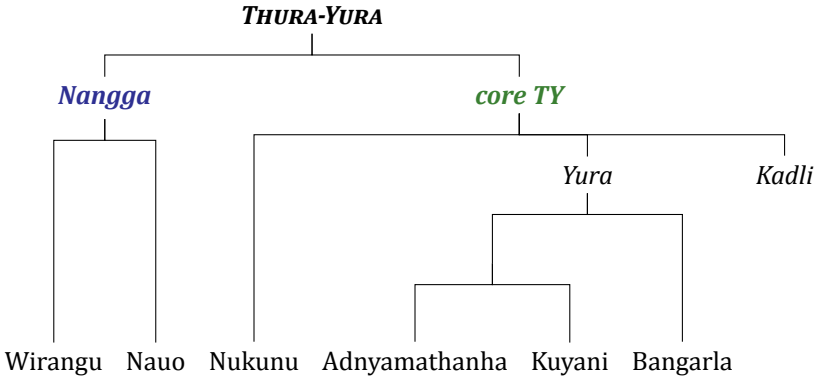
yori ***nyawa****, gajarra* ***nyawa*** *worriba* ***nyawa****, barrbira* ***nyawa****,*
kangaroo **NEG**, possum **NEG** sugarbag.bee **NEG** echinda **NEG**
jagay ***nyawa****.*
sand.goanna **NEG**

'No, this country is no good. There are no kangaroos, no possums, no bees, no echidnas, no sand goannas [in my country].' (Tsunoda 2011:661)

3.3 Thura-Yura: change & renewal in the negative domain

Thura-Yura is a Pama-Nyungan language family, with nine documented varieties historically centered on and around the South Australian coast. The Western varieties of these languages abut the Wati (Western Desert) family. Figure 3.3 describes the familial relations of the described Thura-Yura languages whereas Table 3.1 compares their negative lexica (including a possible reconstruction.) Examples of Wirangu negative predications are given in (140) below.[7]

Figure 3.3. A selection of the internal structure of the Thura-Yura family (spoken in South Australia) following Simpson and Hercus 2004:183. *Nangga* is the name given to the Western subgroup whereas core-ThuraYura refers to the Eastern varieties (see Figure 3.2 above for the approximate geographic distribution.)



[7]Note that (Hercus 1999:57) describes a number of other markers with negative import in her Thura-Yura grammar (including two other lesser-used privatives, which she regards as older. *Cf.* Veselinova's (2016:173) "constant renewal of the negative existentials."

Table 3.1. Reported partitions in the negative semantic space (data adapted from Hercus 1992, 1999, Hercus and Simpson 1996, Schürmann 1844, **?**.) Colouring reflects hypothesised cognacy of lexical items across Thura-Yura. Dashed arrows represent borrowings from neighbouring languages, solid arrows semantic (functional) change.

(Wati)	NEGQ/PRIV	SN	'cannot'/'not yet'
Wirangu [wgu]	*-yudu* *-maga*	*maga*	*guda*
Nauo [nwo]	?	*makka*	
Bangarla [bjb]	*-maga*	*makka*	*kutta*
Adnyamathanha [adt] Kuyani [gvy]	*pari-*	*(g)uda*	–
Nukunu [nnv]	*-wakanha*		
proto-TY		***maka**/*guda*	
Diyari? ([dif] Karnic)			

Table (3.1) shows (colour-coded) four of the negative-associated lexical items in the Thura-Yura family, each of which will be discussed here. It allows for a probable reconstruction of a standard negator (or nominal negator) **maka* and/or SN **guda* in the ancestral language. Of Wirangu [wgu], Hercus (1999:57) claims that privative morpheme *-yudu* has entered the language as a borrowing from the Kokata language, a Western Desert dialect spoken in neighbouring territories to the North ([ktd] Pama-Nyungan: Wati). *-yudu* has largely displaced *-maga* as the form of the privative. The recruitment of a distinctive privative form (from lexical resources of a neighbouring, unrelated language) may well be taken as evidence of pressure for the privileged marking of negative existentials that is taken to motivate the beginning of the NEC (*sc.* stage transition $A \rightarrow B$).

(140) Examples of Wirangu negation strategies (from Hercus 1999)

a. ***maga SN***

Warlba marnaardu-nga ***maga*** *wina-rn!*
wind big-LOC **NEG** go-PRES

'(I am) not going out in a gale!' (142)

b. ***-maga privative***

*Nganha gidya-**maga***
1.SG child-**PRIV**

'I haven't got any children.' (57)

c. ***-yudu privative*** ("most commonly used")

*Nganha barnda-**yudu***
1.SG money-**PRIV**

'I haven't got any money.' (57)

d. ***guda SN (modalised)***

Ngadhu ***guda*** *wangga-rn*
1.SG.ERG **NEG.**IRR speak-PRES

'I can't talk (about this; it's too embarassing.)' (143)

Similarly, Adnyamathanha [adt] and Kuyani [gvy] have recruited *pari-* as a negative existential/predicator of absence (Hercus 1999:141). This may also be a borrowing from the Karnic lanugages that abut Eastern Thura-Yura (e.g. Diyari [dif] *pani* 'PRIV', (**?**, C. Bowern *p.c.*).[8] *maga* retains its function as the primary standard negator particle in Wirangu (and Bangarla [bjb]), whereas *guda* (the standard negator in Adnyamathanha and Kuyani), is restricted to a subset of negative meanings 'cannot' and 'not yet' (note that, particularly in northern Australia, the form of negative marking is often conditioned by speaker mood/reality status, see Miestamo 2005:225, **?** forthcoming.)

A potential cognate in the southern Thura-Yura (Kadli) language, Kaurna [zku] (not represented in Figure 3.3 for a lack of available data) *wakka-* is found (possibly fossilised) in lexical items *wakkarendi* 'err, stray, be lost', *wakkariapendi*, 'forget, not think of, leave behind', *wakkariburka* 'ignorant person, simpleton' (Schürmann and Teichelmann 1840:II-52).[9] All three of these words appear to be analysable; *wakka-* contributing some notion of emptiness, characteristic of an erstwhile nominal negator/privative category.[10]

There are insufficient available data to adjudicate between competing hypotheses that (a) **guda* has been largely displaced by erstwhile nominal negator *maga* in Wirangu or (b) *guda* has replaced **maka* in Adnyamathana/Kuyani. Nevertheless, an analysis informed by the insights of the NEC favours and supports (a).

Under such an analysis, Wirangu – the Thura-Yura outlier – provides a particularly clear example of a language, the negator forms of which are transitioning through the NEC. The erstwhile negative existential *-maga* has entered the domain of standard, clausal negation, adopting the morphosyntactic properties of a preverbal negative (stage $B \rightarrow C$),[11] and triggering the recruitment of a new privative marker from the lexical resources of a neighbouring language *-yudu* which is now in competition with the old marker (stage $A \rightarrow B$). The ostensible simultaneity of these changes also provides further evidence for competition between functional and formal pressures for generalisation and recruitment (*sc.* Veselinova's "constant renewal of the negative existential" (2016:173)).

Additionally, if the directionality of change described here is indeed on the right track,

[8]This remains to be demonstrated, but *pari-* may otherwise be cognate with Wirangu *bal-* 'die,' elsewhere described as a lexical source for negators (Veselinova 2013, van Gelderen this volume). An argument potentially in favour of this is found in a possibility of an example of lexical renewal likely born of euphemism; Adnyamanthana *inta-* 'die' appears to be cognate with Wirangu *inda-* 'spill.'

[9]Note attested stems in *pia-**rendi*** 'scattered, stray', *pia-**riappendi*** 'scatter, disperse', ***burka*** 'adult, man' (Schürmann and Teichelmann 1840:II-4,38).

[10]Data for Kaurna (and other extinct varieties) is scarce, effectively limited to the lexicon published by nineteenth-century missionaries, Schürmann and Teichelmann (1840). A possible reflex of **guda* is found in items like *kudmunna* 'ignorant, not knowing' (II-12). Other negative lexical items reported here are *yakko* which appears to function as a SN marker and *-tinna* which is given as the most frequent form of 'without' (i.e. the privative.)

[11]Note that, while this change is consonant with functional grammaticalisation "generalisation", the transition from bound- to free-form is perhaps surprising in view of the (controversial) claim that grammaticalisation clines involve processes of phonetic reduction and syntactic "rigidification" (e.g. Geurts 2000). If the account described here is on the right track, the trajectory of *maga* in Wirangu constitutes a counterexample of these grammaticalization "form" paths (see van der Auwera 2008, **?**:40 for the dissociation of "formal" and "functional/semantic" grammaticalisation processes).

Wirangu can be shown to resist classification into any unique NEC 'stage', transitional or "cardinal" (in which case the NEC as described in previous work does not represent a complete linguistic typology for negative existential marking strategies.)[12]

3.4 The Yolŋu negative domain

The Yolŋu languages, a Pama-Nyungan grouping of at least six dialect clusters (roughly coterminous with sociocultural groupings) are spoken through Eastern Arnhem Land (in the far north of the continent) by some 12,000 Aboriginal inhabitants (see Wilkinson 2012:18*ff*, Bowern 2009). Yolŋu are strictly exogamous – each cultural group (clan) being associated with a distinct dialect, a situation that has led to a significant amount of stable linguistic variation (and undetermined internal classification, see Schebeck 2001, Bowern and Atkinson 2012:836).

This section compares the negation systems of three distinct Yolŋu varieties: Djambarrpuyŋu [djr], Ritharrŋu [rit] and Wangurri [dhg] in view of making inferences about change in marking strategies over time. A pattern similar to that observed in Thura-Yura is shown. The key findings are tabulated in Table 3.2 below. The final subsection (§3.4.4) comprises a discussion of privative case semantics with particular reference to Yolŋu.

Table 3.2. Partitioning of the negative space in three Yolŋu languages.
'PROH' negates imperatives and SN represents 'standard negation'. 'PRIV' is taken to denote a suffix of the type described above. 'NEGQ' (Wilkinson's "negative quantifier") are independent words that appear to quantify over the NP which they modify (i.e. perform (minimally) the same work as a PRIV suffix.)

	PROH	SN	NEGQ	PRIV
Djambarrpuyŋu [djr]	*yaka*	*yaka* *bäyŋu*	*bäyŋu*	*-miriw*
Ritharrŋu [rit]	*yaka*	*-ʔmayʔ*	*yakaŋu*	*-miriw*
Wangurri [dhg]	*yaka* *ŋangawul* *bayaŋu*	?*yaka* *ŋangawul* ?*bayaŋu*	*ŋangawul* *bayaŋu*	*-nharra*

3.4.1 Djambarrpuyŋu

Djambarrpuyŋu [djr] appears to provide an example of Croft's $B \sim C$ transitional-stage language. Wilkinson (2012:356) describes the coexistence of two markers: *yaka* 'NEG' and *bäyŋu* 'NEGQ' (negative quantifier): claiming that 'both occur as propositional negators,' demonstrated in the data in (141) below, from Wilkinson (2012).

[12]The issues of "assigning" the entire negative domain of a given language to a unique stage in the NEC have been explored in some detail by (Veselinova 2016), who observes similar classificatory issues for a number of languages (e.g. East Futunan [fud]: Polynesian).

(141) a. yaka *as (full) clausal negator*

yaka *ŋayi dhu ga ŋutha-n ŋaṉḏi-wal bäpa-wal*
NEG 3.SG FUT IPFV.INFL grow-INFL mother-OBL father-OBL

'They don't grow up with (their) mother and father.' (Wilkinson 2012:691)

b. yaka *as negator in attributive (nonverbal) predication*

yaka *dhuwali ŋatha, dhuwali ŋula nhä-n dhuwali botjin*
NEG MED food MED INDEF what-SEQ that poison

'That isn't food, that's something else, that's poisonous.'
(Wilkinson 2012:560)

c. yaka *as negator in possessive construction*

warrakan limurruŋ ***yaka*** *dhuwal*
animal 1.PL.INCL.DAT **NEG** PROX

'This meat isn't ours/for us.' (author's fieldwork; AW20190505)

d. bäyŋu *as clausal negator*

bäyŋu *ŋarra gäthur ŋorranha manymak-ku nha munhawu*
NEGQ 1.SG today lie.INFL good-TR.INFL night

'I didn't sleep well last night.' (Wilkinson 2012:357)

The distributional difference between these two markers is twofold. According to Wilkinson, *yaka* is ungrammatical in quantificational contexts and that *bäyŋu* does not appear in imperative (*i.e.* prohibitive) contexts. It seems, then, likely, that in Djambarrpuyŋu, *bäyŋu*, an erstwhile negative existential has begun to encroach further into the negation space, entering into competition with *yaka*. *bäyŋu*, with reflexes in other Yolŋu languages, derives from (fairly productive) verbal root *bäy-* 'leave.'[13] Examples of negative existential uses of *bäyŋu* are given in (142) and prohibitive uses of *yaka* in (143).

(142) *Djambarrpuyŋu negative quantification*

a. *(*yaka/)****bäyŋu*** *ŋarra-ku gi ŋorri ŋula dhiyal wäŋa-ŋur-nydja*
*NEG/**NEGQ** 1.SG-DAT IPFV.INFL LIE:INFL INDEF PROX.LOC place-LOC-FOC

'I don't have any here' (lit. 'at this place lie (are) none of mine') (Wilkinson 2012:691)

b. *bili (#yaka/)****bäyŋu*** *limurruŋ dhuwal bäwarraṉ*
because #NEG/**NEGQ** 1.DL.INCL.DAT PROX animal

Intended reading: 'Because there's no meat for us.'
(Wilkinson 2012:560, infelicity judgment AW20190505, cf. 141c)

[13]Note also that *-Thi* 'INCH' derives absence-associated change-of-state readings: *bäy-thi* 'be left over/behind'; *bäyŋu-thi* 'be/have none, pass away, die' (Wilkinson 2012:378).

(143) *Djambarrpuyŋu imperative negation (prohibitive, see also §3.4.4)*

yaka(/*bäyŋu)	*waŋi!*
NEG(/*NEGQ)	talk.INFL

'Don't talk!' (Wilkinson 2012:360)

There are multiple arguments for a reconstruction of **yaka* to proto-Yolŋu. First, the fact that it is reported as a negative particle in all Yolŋu languages (Schebeck 2001:31).

Secondly, possible lexical cognates are reported in likely sisters to Yolŋu in the Western Pama-Nyungan subfamily (a monophyletic branch reconstructed in Bowern 2012:838). **?**:226 and O'Grady (1963:67) both report a Nyangumarta ([nna] W. Pama-Nyungan: Marrngu) verb *-yaka-* meaning 'leave, quit.' McKelson (1974:35) additionally gives *yaga* as an alternative (potentially emphatic) negative particle in Mangala ([mem] Marrngu). It is very possible that these Marrngu verbs are cognate with the Yolŋu negator, despite Marrngu and Yolŋu having been distantly separated for centuries. Dixon (2002:85) lists other potential cognates to negative *yaka* from a number of other dispersed Pama-Nyungan languages.

Thirdly, the generalisations of the NEC as formulated by Croft (1991) and Veselinova (2016) a.o. provide a principled typological basis through which an erstwhile negative existential construction arises in a language and begins to encroach upon the functional domain of a standard (clausal) negator (transitional stage $B \sim C$.) If this diachronic analysis is on track it may have implications for our understanding of the characteristics of stage $B \sim C$: negative imperatives (prohibitives) being one of the last 'holdouts' for an erstwhile SN marker that is threatened by competition from a negative existential or quantifier.Dixon's typology (2002:84) indeed entails an implicational relationship: if there is formal syncretism between privative and prohibitive marking, then these will be syncretic with the SN marker as well. Gumbaynggir ([kgs] Pama-Nyungan: Southeast; Eades 1979) and Nyawaygi ([nyt] Pama-Nyungan: Dyirbalic; Dixon 1983) are given as examples of a languages for which the prohibitive patterns distinctly from all other negative functions (a datum which is a potential indicator of a language in NEC stage $B \sim C$). The Ritharrŋu data presented in §3.4.2 below raise a potential counterexample.

3.4.2 Ritharrŋu

The facts outlined in Heath's 1980a description of **Ritharrŋu** [rit] diverge in a number of significant ways from the Djambarrpuyŋu situation described above. Further, they appear to pose a potential problem for the generality/predictive power of the NEC as formulated.[14] While a form *bayŋu* has been retained in the language (glossed as 'nothing'), there is an additional suffixal form *-ˀmayˀ* used as the "basic" (Heath 1980a:101) general negator alongside *yaka* (the latter form is the standard means of forming prohibitives in Ritharrŋu, shown in 145).

(144) *Standard and copular negative suffixation of -*ˀmayˀ *in Ritharrŋu*

a. *wäni-na-**ˀmayˀ** napu*
go-PST-**NEG** 1.PL.EXCL

'We didn't go.'

[14]Data provided from Heath (1980a) has been standardised to an Australianist (Yolŋu) orthography from his original IPA transcription.

b. *munaŋa-**ʔmayʔ*** *rra*
white.fellow-**NEG** 1s

'I'm not white' (Heath 1980a:101)

(145) *Prohibitive formation with* yaka *in Ritharrŋu*

yaka *nhe* *baŋgurlʔ-yu-ru*
NEG 2.SG return-*them*-FUT

'Don't come back!' (Heath 1980a:76)

Existential negation, however, is introduced by the complex form *yaka-ŋu* (shown in 146 below). This form is clearly related to the Djambarrpuyŋu SN particle described above, with archaic Yolŋu suffix *-ŋu* (described as an 'adjective ⇒ substantive' derivation by Schebeck 2001:34, see also Wilkinson 2012:174ff, Heath 1980a:24.) Heath glosses *yakaŋu* as a particle meaning 'absent' (1980a:102).[15] Recalling the possible lexical sources of pan-Yolŋu form (table 3.2 *supra*) **yaka* discussed in the foregoing section, this is an appropriate translation.

(146) *Existential negation with* yakaŋu *in Ritharrŋu*

a. ***yakaŋu*** *ŋay* *dhäŋgu*
NEGQ 3.SG meat

'There's no meat.' (Heath 1980a:102)

b. ***yakaŋu*** *ŋay* *(yaŋʔŋara)*
NEGQ 3.SG (here)

'He isn't here' (Heath 1980a:102)

While it may be tempting to relate *bäyŋu*, as found in other Yolŋu languages, to a possibly lenited form *-ʔmayʔ*, as Heath (1980a:102) points out, it is much more likely to be a borrowing from the geographically neighbouring language Ngandi [nid], an unrelated, non-Pama-Nyungan language also spoken in southeastern Arnhem for which *-ʔmay* is a fusional negative-cum-present tense suffix. Given the structure of the negative domain in Ritharrŋu (*i.e.* the use of *-ʔmayʔ* in (zero-)copular clauses (144a) and its apparent unavailability to quantificational/existential predication) provides support for the borrowing account, which is considerably more parsimonious than an account by which the syntax, semantics, phonology and perhaps morphology of *bäyŋu* were radically reorganised into a SN suffix. If this is indeed the case, it provides counterevidence to the hypothesised unidirectionality of the NEC (e.g. Veselinova 2016:146) given that an innovative *standard negator* has been recruited into Ritharrŋu's negative space, whereas the so-called "special negators" have retained an older form (Figure 3.4).

[15]Note that Heath also points out that stance predicates with copular/existential readings can also receive negative marking as in (146b′) below.

(146b′) *nhiena-**ʔmayʔ*** *ŋay* *yaŋʔ-ŋarṛa*
sit.PRES-**NEG** 3.SG here

'He isn't (sitting) there' (Heath 1980a:102)

Whatever the providence of -*ʔmayʔ*, this is the marker of standard clausal negation whereas existential negation appears to be obligatorily marked by *yakaŋu.* Incidentally, on the basis of the limited data presented here, Ritharrŋgu, a language closely related to Djambarrpuyŋu, might *synchronically* be described as a stage B language *per* the negative existential typology described in this volume, although such a description plasters over the likely diachronic trajectory of Ritharrŋu negative marking.

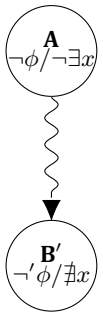


Figure 3.4. Not predicted by the NEC, Ritharrŋu appears to have recruited an innovative clausal negator $\neg'$ into negative space. This is likely to be an effect of extended contact with an unrelated non-PN language (Ngandi [nid]).

3.4.3 Wangurri

Finally, negation in **Wangurri** [dhg], a northern Yolŋu dialect, appears to make use an additional particle with the semantics of a general negator, *ŋangawul* in addition to *yaka* and *bayaŋu*. McLellan (1992:195) claims that *ŋangawul* and *bayaŋu* can be used in all negative contexts and that *yaka* cannot be used as a "negative quantifier." These data are exemplified in (147) below, all adapted from McLellan (1992).

(147) a. *Negative existential use of* ŋangawul

gulitj-ma ***ŋangawul****-nha* *ŋanapiliŋgura* *ŋapa-ŋa* *gayŋa* *nyena*
true-DP **NEG**-DP 1.PL.EXCL:loc back-LOC IPFV.INFL sit.INFL

'No true ones at our backs are living (*i.e.* descendants.)' (246)

b. *Clausal negation use of* ŋangawul

ga ***ŋangawul*** *ŋaya* *barpuru* *nhawun* *ŋunhuŋ* *yolŋu-wuŋ* *ŋäku*
and **NEG** 1.SG recently like that.ABL person-ABL hear.INFL
dhäwu
story

'I didn't recently hear the story about that person.' (136)

c. *Negative imperative with* yaka

Yaka *dhaŋu* *ŋäpikiʔ-murru* *garruwa*
NEG this white.person-PERL speak.IMP

'Don't talk through white (language)!' (195)

d. *Negative imperative with* ŋangawul/bayaŋu

Ŋangawul/bayaŋu *ŋäpakiʔ-murru-m* *garrun,* *bayaŋu/ŋangawul!*
NEG/NEG white.person-PERL-DM speak.NEU[17] NEG/NEG

'Don't talk through white (language), no!' (195)

e. *Potential ambiguity between standard and negative existential readings with* ŋangawul

***Ŋangawul**-nha ŋaya rakaran nhangul*
NEG-DM 3.SG tell.PFV 3S.ALL

(i) 'I told him nothing.' (≈ 'There is no thing such that I told him that thing.')
(ii) 'I didn't tell him'(≈ 'It's not the case that I told him [that thing.]') (196)

The Wangurri data show competition between three separate markers and provide a series of interesting insights and questions in view of predictions the NEC would make. The domain of *bayaŋu* (cognate with *bäyŋu* as described above) has further expanded into the prohibitive domain, behaviour that, taken in isolation, may suggest that this marker has moved further along the cycle drawing Wangurri further towards a C-type system (characterised by the availability of ambiguous readings shown in 147e).

Nangawul appears to be an innovation. It has an unclear etymology and stands in no obvious relation to a potential cognate in any related or borrowing from any neighbouring language. Given its wholesale entry into the negative domain – that is, this lexical item's ability to negate verbal clauses, existential clauses and imperatives, it is unlikely that the grammaticalisation of this item taken in isolation can be marshalled as evidence of the NEC. Further research on Northern Yolŋu has the potential to shed light on the change in available readings associated with *ŋangawul*, but until that point, our best hypothesis may be one of lexical replacement, where *ŋangawul* analogistically replicates the domain of the (likely older) negator *bayaŋu*, whose emergence in Yolŋu was described in §3.4.1.

The manifestation of the NEC in Yolŋu is further nuanced below, when we consider additional competition from privative morphology in these languages.

3.4.4 The PRIVative in Yolŋu

All Yolŋu languages make regular use of a *privative* suffix 'PRIV' (see Table 3.2 above). For most languages, the phonological form of this marker is *-miriw*. The only exceptions to this are found in Dhaŋu-Djaŋu ([dhg], including Wangurri), for which the form is *-nharra* (Schebeck 2001:34) and Yan-nhaŋu [jay] *-nharraŋu* (C. Bowern, p.c.). This latter form may be cognate with the Warluwarra [wrb] and Bularnu [yil] (Pama-Nyungan: Warluwaric) privative *-nharra(ŋu)*. Warluwaric is given by Bowern and Atkinson (2012) as the most likely closest sister node to Yolŋu in Western Pama-Nyungan. If this is the case, then ***nha-* can be reconstructed as a WH-particle to these subgroups' most recent common ancestor (cf. **?**:576). It is used as the basic root WH-words and indefinites (e.g. *nhä*$_{[dhg]}$; *nhangarli*$_{[yil]}$ 'what, something') in Yolŋu and Warluwaric. *yarraba* shows up in Bularnu in some contexts as a word for 'nothing' (**?**:626, 690) – the univerbation of ***nha* and ***(y)arra* into some type of negative indefinite is therefore a possible source for the *-nhärra* privative.[18]

The etymology for *-miriw* is unclear (although it possibly stands in some relation to *miḏiku(ʔ)* 'bad'$_{[rit]}$, 'rubbish (incl. a sororal kinship relation)'$_{[djr]/[guf]}$ and appearing in

[17]It is unclear whether the difference in verb inflection between *yaka-* and *ŋangawul-/bayaŋu*-prohibitive is categorical. If it is, this may be construed as additional evidence that the use of *ŋangawul/bayaŋu* for prohibitive formation is a more recent innovation (and consequently does not trigger the relatively infrequent imperative inflection.)

[18]Further support for this etymology comes from Wakaya ([wga] Warluwaric) *-nhawerru* 'PRIV' (Brammall 1991:36). *-werru* is the Wakaya proprietive marker (<Proto-Warluwaric **-warra* 'PROP'); consequently, *-nha-* seems to have acquired some type of negative semantics.

words like *miḏik-uma* ‘make.badly’ *miḏik-irri* ‘go.badly’, *noy-miḏiku’ŋu* ‘feel-sad’ *etc.*) In view of the facts above, we have reason to reconstruct a proto-Yolŋu privative **-nharra*, replaced by innovative *-miriw* in the bulk of contemporary (viz. non-Northern) varieties.

In §3.2.2 above, we saw a potential semantics for canonical uses of privative marking. This semantics, which understands the privative as a quantifier that predicates nonexistence of the NP in its scope, restricted to a domain that is provided elsewhere in the discourse, suitably captures nonexistence, absence, and non-possession readings of privative NPs. This semantics for the “canonical privative”, however, papers over the significant degree of semantic variation in markers described as ‘privatives’ in the Australianist descriptive tradition. Djambarrpuyŋu *-miriw* appears felicitous in the broad range of contexts shown in (148) below.

(148) A broad range of meanings available to Djambarrpuyŋu [djr] *-miriw* ‘PRIV’

a. -miriw *predicating non-possession*

*weyin muka ŋarra dhuwal nhinana-ny yothu-**miriw***
long okay 1.SG PROX sit.III-FOC child-**PRIV**

‘for a long time I lived here without children’ (Wilkinson 2012:445)

b. *Privative use of* -miriw*; synonymous with* bäyŋu ‘NEGQ’

*yolŋu-ny gan nhinan warraŋul bala’-**miriw**, **bäyŋu** bala’*
people-PROM IPFV.INFL sit.INFL outside house-**PRIV** **NEGQ** house

‘People used to live outside without houses, there were no houses’
(Wilkinson 2012:443)

c. *Negative existential use of* -miriw

*bili yätjkurr ŋunha wäŋa warralŋur-nydja gapu-**miriw***
because bad DIST land NAME-FOC water-**PRIV**

‘...because the place is bad. (It’s) without water.’ (= there’s no water)
(Wilkinson 2012:443)

d. -miriw *predicating the absence of a de-verbal property*

*maŋutji ŋorra-nha-**miriw** ŋunhayi wäŋa*
eye lie-IV-**PRIV** DIST.LOC place

‘It’s impossible to sleep at that place.’ (Wilkinson 2012:448)

e. *Privation of a de-verbal relation*

*l̲uka-nha-**miriw** ŋayi nunhi dharpa-ny*
eat-IV-**PRIV** 3S ENDO tree-PROM

‘That tree is not edible.’ (Wilkinson 2012:446)

f. *Privation of an eventive de-verbal relation*

*djamarrku̲li-y’ marrtji lakaram ba̲datju-na-**miriw***
children-ERG go.I speak.I make.mistake-IV-**PRIV**

‘The children were speaking without making mistakes’
(Wilkinson 2012:449)

g. -miriw *in a subordinate clause: privation of a de-verbal property/disposition*

*...ga yolŋu-wal-nha ŋuri-kal-nha wäŋa nhä-nha-**miriw**-wal-nha*
and person-OBL-SEQ ANA-OBL-SEQ place see-IV-**PRIV**-OBL-SEQ
miltjiri-wal-a
blind-OBL-SEQ

'...and to the person who cannot see the place, the blind.'
(Wilkinson 2012:448)

h. *Negative predication (locative)* **Context:** A response to the question 'is it inside?'

*yaka, djinawa'-**miriw***
NEG, inside-**PRIV**

'No, it isn't inside.' (Wilkinson 2012:445)

i. *Prohibitive use*

*luka-nha-**miriw**-nha dhuwali-yi-ny dhulŋuŋu-n ŋatha*
eat-IV-**PRIV**-SEQ there-ANA-PROM assigned-SEQ food

'Don't eat it, that food is for someone else.' (Wilkinson 2012:446)

The data in (148) are extremely relevant for current purposes. They show how the semantic domain of the PRIV, a lexical item with the semantics of canonical negative existential, has expanded (such uses of PRIV are reportedly ungrammatical in other varieties, including Yan-nhangu [jay], Claire Bowern, p.c.). Whereas these markers are generally thought of as quantifying over a domain of individuals (a-c) above, the remaining examples (d-i) all show *-miriw* ranging over a domain of *eventualities*. Morphologically, *-miriw* is suffixed to a verbal root in the fourth inflection *-∅~-na~-nya~-nha* 'IV', ostensibly the strategy for deriving eventive nominals from verbal predicates (*sc.* nominalisation, see Lowe 1996:103). In (g), for example, *-miriw* seems to actually scope over an eventive nominal whose semantics derive from an entire VP: 'the person such that that person engages in no event of 'seeing places.'[19] Similarly, (h) appears to mark the absence of a co-location relation between two objects. This verbless sentence gets its negative force from the privative suffix. Our common conceptions of privative marking certainly do not predict this function.[20]

[19]Provisionally adapting the formalism from page 76 such that *-miriw* is able to range over D_ε, the domain of eventualities (here I use $e, e' \in \mathcal{E}$ as variables of eventualities), the meaning of *yolŋu wäŋa nhänha-miriw* person place see.IV-PRIV 'person who doesn't see places' might be translated as follows:

$$[\![yoluwanhnha - miriw]\!] = \textbf{no}(\lambda e_\varepsilon.\textbf{see}(\text{place})(e), \lambda e'_\varepsilon.\textbf{char}(\delta_{\text{person}}, e'))$$

That is, the intersection between the set of *eventualities of seeing places* and *the contextual domain of eventualities* **char**$(\delta_{\text{person}}, e')$ – perhaps those that might be predicated of/taken to be **char**acteristic of the disposition of a (blind) person (δ_{person}) – is empty.

Note that the apparent introduction of a modal component in (148d-i) can be easily accommodated by Francez's (2007) formalism as the contextual retrieval of a relation ($\mathcal{R}$ = **char**) that retrieves information about the disposition of the pivot.

[20]Note however, that Tamm (2009, 2015) reports the parallel use of abessive suffixes and a preverbal negator in Estonian. She suggests a difference between the two strategies that is anchored in some shade of modal meaning (i.e. "a presupposition about a plan, a standard or an expectation considering a normal state of affairs"). See §3.6 (note 29) for more.

Also notable is the use of privative constructions in forming prohibitives, shown in (148i). Wilkinson (2012:446) notes that here, privative-marked eventive NPs express "a complete negative predication...stronger, less polite than regular imperatives." This strategy indeed seems analogous to English utterances of the type 'no smoking' and 'no eating', which indeed do carry imperative force and are constructed in a manner that appears to quantify over 'smoking' and 'eating' events in the utterance context.

This subsection has marshalled data about an evident expansion in the semantic domain of the privative marker in Djambarrpuyŋu; from predicating *absence of "things"* to predicating the *nonactualisation of events* in a given context. This consequently points to the apparent generalisation of a lexical item out of the semantic space of traditional 'negative existentials' into functions that are normally asociated with standard (or other special types of) negation. The following section on Arrernte negation will investigate an ostensibly similar phenomenon further along the cycle; one that has rendered these languages outliers with respect to typological generalisations about negation strategies in Australian languages. This section should shed further light on the 'bleaching/generalisation' pathways of special negators.

3.5 Arandic: the nominal status of negated verbals

Along with a number of other Arandic varieties, Mparntwe (Alice Springs) Arrernte ([aer] Pama-Nyungan: Arandic) is spoken in the Central Australian desert. It is one of several of Australian languages that marks negation with a verbal suffix, fused into the verbal complex and diverging from the broad characterisation of Australian languages deploying preverbal SN marking made at the beginning of this chapter. According to Wilkins (1989:71), this negation suffix *-(t)yekenhe~-tyange*[21] 'replace[s] tense [marking]' in this language; that is, the main verb of a negated clause carries none of the tense/mood/aspect information that it does in a positive Arrernte clause. An inflection-bearing auxiliary from the *"existential-positional" class* (predicates with stance or motion semantics which are grammaticalised in copular and existential constructions), is then optionally introduced to encode this information as shown in (149a). (149b) gives an example of temporal information (*viz.* pastness) being (presumably) supplied by the nonlinguistic context.

(149) Upper Arrernte ([aer] Pama-Nyungan: Arandic)

a. *Anwerne-k-artweye mape-le pmere kurn-ile-**tyekenhe** ne-**ke**.*
1p-DAT-custodian PL-ERG country bad-CAUS-**NEG** be-**PST**

'Our ancestors didn't (ever) hurt the country.' (Wilkins 1989:235)

b. *Kweye, the ng-enhe aw-**etye=akenhe***
oops 1S.ERG 2S.ACC hear-**NEG**

'Sorry, I didn't hear you' (**?**:412)

[21] The form of this suffix is given as *-ety(e)=akenhe~-etayng* in **?**. I have not changed the orthography in example sentences cited here, rather opting to replicate the orthographic forms and glossing decisions of each author. The sole exception to this is standardisation to Leipzig glossing conventions and Henderson's $\text{VNeg}_{(1/2)}$ to NEG.

Wilkins (1989:235, fn 17) suggests that the negative suffix is historically derivable from 'the nominalising suffix *-(n)tye*', to which a possibly erstwhile negative form *kenhe*,[22] with reflexes in other Arandic varieties, attaches (see also Yallop 1977:275). Support for this semi-complete univerbation is found in the fact that a number of formatives can be inserted at the boundary between the negative inflections two postulated components (see Wilkins 1989:378*ff*), shown in (150a). Seizing on this argumentation, **?**:411-26 goes to some lengths to demonstrate the nominal status of verbal roots inflected with *-etye=akenhe*; some of these arguments are rehearsed here in view of better understanding the diachrony of Arrernte negation, although the reader is referred to his work for more evidence in favour of this analysis.

(150) The status of negative inflection in Eastern/Central varieties of Arrernte [aer]

a. En(do)cliticisation of adverbial particles in the verbal negator

*Re=atherre untyem-eke~untyeme an-err-eme angk-err-**etye**«arlke»**akenhe***
3.DL.NOM facing.away-DAT=REDUP sit-.DL-PRES speak-RECIP-**NEG**«also»

'The two of them are sitting down and not talking to each other.' (**?**:417)

b. Apparent ergative suffixation in cases of secondary predication (obligatory *iff* the main predicate is transitive)

*Re il-eke arlkw-**etye=akenhe**-ele*

'S/he cooked without eating.' (**?**:418)

c. Negated verb form taking nominal negator

*Angk-**etye=akenhe**-kwenye; irnterre anthurre angk-eke*
speak-NEG-NomNEG intensely INTENS speak-PST

'(She) wasn't *not* talking; she was talking a lot.' (**?**:416)

The sentences in (150) suggest some convincing arguments for the emergence of a standard negation strategy out of an erstwhile special nominal negator. (a) provides formal evidence of the complex status of *-tyekenhe*: a set of adverbial particles (including *=arlke* 'also', *=nthurre* 'really', *=ante* 'only' *etc.*) appear to be able to intervene between the 'nominalising formative' *-etye* and the 'negating formative' *=akenhe*. It should be noted that cross-linguistically, this appears to be a set of (adverbial) operators that associate with focus (e.g Jackendoff 1972, Rooth 1985). According to Wilkins (1989:381), the locus of insertion of these particles indeed has scopal implications, compare *(ayenge) arlkwe-**tyekenhe**=ante* '(I) only didn't eat' and *(ayenge) arlkwe-**ty**«ante»**kenhe*** '(I) didn't only eat.'[23]

Ex. (150b) shows the negated verb receiving ergative marking when participating in secondary predication alongside a transitive verb. In this sense, the negated verb again behaves morphosyntactically identically to nominals (and unlike positive verb forms).

[22] A particle *kenhe* is also reported by Wilkins (1989:372) which is glossed as BUT and indeed appears to have the syntax of a coordinator. While the semantics may contain some element of negative/subtractive meaning, it is unclear what relation this particle bears to the verbal negator (including questions about possible directionality of semantic change or whether this is merely an example of homonymy.) In related Arandic language Kaytetye [gbb], this form is translated as 'might' (**?**:424)

[23] A complete analysis of this phenomenon is outside the scope of this paper, although assuming a standard semantics for *only* (e.g. Horn 1969), the correct truth conditions can be derived by understanding *=ante* as taking wider scope over the negated predicate in the first case ('not eating' is the only thing I did), whereas it scopes narrowly in the second case ('eating' is the only thing I didn't do').

Interestingly, (150c) shows a verb form with negative marking occurring with the privative[24] *-kwenye* in what is likely an example of metalinguistic negation (see e.g. Horn and Wansing 2017:19 for an discussion of this phenomenon). Further work remains to be done on this topic, but this provides striking evidence for both the (semi-)nominal status of the negated verb and the renewal of a special nominal negator in Arrernte. Additionally, Veselinova (2016:171) points out that nominalisation of lexical verbs is a component of the most common cross-linguistic 'pathway whereby negative existentials break into the domain of SN (i.e. $B \rightarrow C$, see also §3.6 for further discussion).

Data for related Arandic languages is sparse, it is therefore not possible at this time to reliably reconstruct the trajectory of negative marking in the the Eastern and Central dialects reported on here. Nevertheless, Katetye, the sole Arandic outlier (see Hale 1962, Koch 2004), is also reported to make use of a suffix *-wanenye* to negate 'actions' and to mark privative relations (Kaytetye **?**:826). That verbal suffixation, a standard negation strategy otherwise atypical of Australian languages (I am aware of no Pama-Nyungan outside of Arandic that makes use of a similar strategy),[25] is found at both ends of this subgroup, suggests a scenario in which privative markers came to displace other strategies of standard negation relatively early in its history. If this analysis is on track, then we can infer that the Arandic languages have undergone a full cycle of the NEC, and that, in view of the renewal of the privative form (*-kwenye*) described in various Upper Arrernte varieties above (a likely characteristic of stage B), we can further postulate the recommencement of the cycle.[26] This diachronic trajectory is summarised in Figure 3.5. Consequently, it appears that the generalisation of a nominal negator in Arandic seems to have effected a wholesale restructuring of standard negation strategies and, consequently, the negative domain in these languages.[27]

[24] *-kwenye* is glossed by both Wilkins 1989, **?** as a "Nominal Negator" 'NNEG', although at least Wilkins 1989:158 treats this term as synonymous with 'PRIV'.

[25] Note however that (some) Wati varieties (including Pitjantjatjara [pjt]) express standard negation by way of a nominalised verbal predicate (note that the nominaliser *-nytja* is also phonologically very similar to the Arandic nominaliser described above) and postverbal negator *wiya*, pointing to a similar trajectory (Sasha Wilmoth, *pers. comm.*) This negator *wiya* is also used in privative constructions.

(i) a. *wiya* + nominalisation for sentential negation in Yangunytjatjara [kdd]

ngayulu	*kati-nytja*	*wiya,*	*Anti-lu*	*kati-ngu*
1S.ERG	take-NMLZR	NEG	Andy-ERG	take-PRES

'I didn't take it. Andy took it.' (Goddard 1983:244)

b. *wiya* + noun for negative existential in Yangunytjatjara

mitjini	*wiya-ngka*	*panya,*	*iriti...*
medicine	NEG-LOC	ANA	long ago

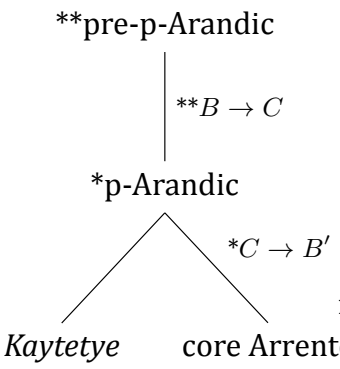
'(That was) in the old days, you know, when there was no medicine.' (Goddard 1983:39)

[26] Note that a possible implication of this is the instantiation of a direct $C \rightarrow B'$ stage where a language with homophonous standard and existential negation directly recruits a new existential negator into the system. Given the tendency in Australian languages towards existential predication by bare NP (contra Croft 1991) or stance verb, discussed in §2.2 *supra*, this may be expected.

An alternative analysis, informed by the NEC, may involve treating the 'nominalising element' in Arandic negative suffixes as a (further) grammaticalised existential. Note for example the plausible phonological similarity between "existential-positional" verbs *-ne-* 'sit', *-nte-* 'lie' and the Kaytetye and Mpwarnte Arrernte nominalising elements *-nge, -tye*. Far from determined, such an analysis bears further research: a full diachronic account of Arandic verbal derivation is out of the scope of the current work.

[27] I make no particular claim about the form of these markers, although by hypothesis, the form of the privative in some common pre-proto-Arandic ancestor is a reflex of present day Arandic =*kenhe*.

Figure 3.5. Summary of reconstructed changes in the Arandic negative domain in terms of NEC stages (A, B, C)



i By hypothesis, pre-proto-Arandic conforms with 'standard average Australian' preverbal SN strategies with a distinct post-nominal privative (***kenhe*) $\boldsymbol{B}$

ii In proto-Arandic (most recent ancestor to documented varieties), nominalisation plus privative suffix is repurposed as a productive negative strategy $\boldsymbol{C}$

- This strategy has likely been retained in Kaytetye [gbb]

iii A new nominal negator (*-kwenye*) emerges in core Arrernte varieties $\boldsymbol{B'}$

- Currently, there is insufficient evidence for an intermediating $\boldsymbol{A'}$ stage in Arrernte.

3.6 Discussion

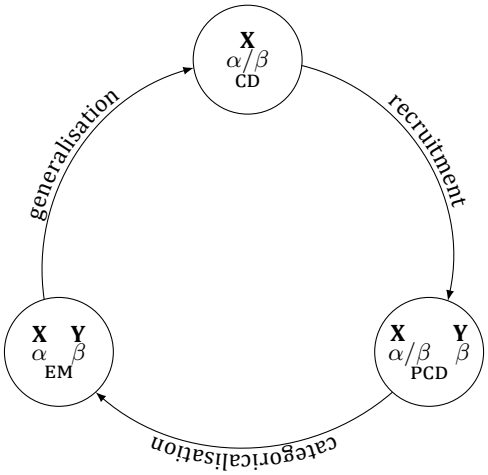
The data presented above demonstrate a robust, grammaticalised sensitivity to a distinction between 'standard' clausal negation and the negative existential predication (*i.e.* predications of absence) in three distinct subgroups of Pama-Nyungan. We have also seen evidence of an ostensible diachronic tendency to flatten this distinction, as the conditions of use for negative existentials appear to relax, at which point they encroach into the domain of an erstwhile verbal negator (*e.g.* Yolŋu). By hypothesis, it is these two processes that underpin the NEC as described. This section attempts to situate the NEC – as it appears to have been instantiated in these Australian languages – in the context of broader work on the cyclical nature of meaning change.

3.6.1 Semantic change and grammaticalisation pathways

The notion of 'grammaticalisation' – that process whereby grammatical categories arise in languages by way of the recruitment and reanalysis of lexical content – is one that has attracted a good deal of functional typological work (e.g. Bybee and Dahl 1989, Bybee et al. 1994, Dahl 1985, Heine and Kuteva 2003, Traugott 1980 a.o.). Of particular importance is the finding that, cross-linguistically, these grammatical categories evolve along diachronic pathways that appear to be constrained and unidirectional. This observation is the explicandum at the heart of contemporary work on meaning change and one that is of significant importance for our understanding of semantics and language change. In recent years, bringing formal tools for describing the 'interpretation of functional expressions' to bear on these questions has been fruitful (see Deo 2015a for a detailed overview of this enterprise).

Deo (2015b) provides a framework to understand the general structure of – and motivating forces behind – a cyclical change. This is shown in Figure 3.6 (as will be discussed below, note that this diagram is not isomorphorhic to the one in NEC diagrammatisation in Figure 3.1).

Figure 3.6. The structural properties of cyclical meaning change as formulated by Deo (2015b a.o.) A marker (form) **X** is ambiguous between two readings α, β at the context-dependent stage (CD), a marker **Y** is recruited to encode β at the partially context-dependent stage (PCD), whereupon it categoricalises, such that **X** can no longer be used to encode β: now the distinction between the two meanings is explicitly marked (EM). Eventually, the domain of use for **Y** generalises at which point **Y** is now ambiguous between α, β (CD′).



Insofar as the NEC is concerned, Deo's 'context dependent' (CD) stage corresponds to Croft's 'relatively unstable' stage **C** (i.e. that state of a language where negative existential markers are identical to the standard negator). Croft (1991:19) claims that the motivation for this stage is the idea that '[for] predication in general, existential predication is analogous to a verbal predication.' His suggestion that 'the analogy is strengthened if there is formal parallelism' underpins formal pressure to innovate an existential predicate, returning the system to stage **A**. Additionally, as has been shown elsewhere (e.g. 147e above), stage **C** negative predications can be ambiguous between the two readings; another likely source of functional pressure for the recruitment of new strategies.

The discussions of Yolŋu and Arandic above have provided some evidence for the trajectory of negative existential/privative marking as they generalise, encroaching into the functional domain of an erstwhile standard negator (transitions from A/B into stage C). For example, as shown, while privative marking initially appears to be restricted to absence predications of individuals, they seem to gradually become available to eventive nominals. Strong evidence of this was provided from Arrernte, where all negative predicates have the syntax of non-derived nominal predications, at the expense of inflection of tense, mood and aspect categories. Additionally, on the basis of comparative evidence, Djambarrpuyŋu *bäyŋu* shows signs of having been a negative quantifier that now has acquired the general semantics of a verbal negator (142-143) *supra*. The following subsection further motivates this generalisation phenomenon.

3.6.2 Generalisation: & the notion of 'indexicality' & expanding domains

The expansion of the domain of the negative existential construction predicted by the NEC $(B \rightarrow C)$ can be understood as a diachronic *generalisation* in its semantics. Generalisa-

tion refers to that stage in a grammaticalisation cycle where '[a functional expression] is diachronically reanalyzed as instantiating a broader, more general functional expression at a later stage...involv[ing] a systematic expansion in the domain of application [for that expression]' (Deo 2015a:187). The treatment of the privative given above, for example, has shown how, in multiple language groups, the domain of this marker has expanded. Broadly speaking, whereas at an initial state, PRIV seems to quantify over a domain of properties of individuals, it comes to quantify over properties of eventualities and, in some instances, further generalises to quantify over propositions (*sc.* properties of worlds; the domain of modals, and possibly, negative operators, see Horn and Wansing 2017:34*ff*.) Importantly, even if restrictions on the type of the sets is relaxed, the *relation* ($\mathfrak{no}$) that is taken to hold between the sets being quantified over is identical (*i.e.* $\mathfrak{no} =_{\text{def}} \lambda\mathcal{P}_{\langle\sigma,t\rangle}\lambda\mathcal{Q}_{\langle\sigma,t\rangle}.\mathcal{P} \cap \mathcal{Q} = \varnothing$).[28,29]

? suggests that grammaticalisation trajectories in general are characterisable by the loss of *(discretionary) indexical content* (*e.g.* Perry 2012:68*ff*). That is, reanalysed forms lose their dependence on context for retrieving discourse reference.[30] Deo appeals to this notion in describing grammaticalisation pathways in which (distal) demonstratives gradually lose their indexical force to become markers of definiteness, specificity and eventually noun class markers (see also de Mulder and Carlier 2011, Greenberg 1978, Stevens 2007:61). The progressive to imperfective shift can also be fruitfully understood as the relaxation of a requirement, peculiar to the progressive aspect, for a specific, discourse salient reference interval that relies on pragmatics ($\approx$ discretionary content provided by some construal of 'speaker demonstration') for evaluation. The newly emergent 'imperfective' does not have this indexical/context-dependent content.

An interesting parallel in terms of thinking about the recruitment of formal mechanisms for existential predication is the observation that existential *there* in English is homonymous with deictic *there* (a discretional indexical par excellence.) This is suggestive of some functional connection between existential propositions and notions of indexicality as described above (and indeed, formal similarities between locative/existential predications have been observed elsewhere). Francez's 2007 treatment of existential predications, adapted in (138c) above, crucially makes reference to their context dependence (formally represented as a contextual parameter d_α) This captures the intuition that the utterance of an existential proposition relies on wide construals of context for domain restriction and evaluation: that is, the proposition *there are no sticks* cannot be evaluated without reference to the speaker's intentions: the contextual parameters of utterance (most likely (but not necessarily) those spatiotemporal conditions under which it was uttered).

[28]Hamari (2011) gives evidence of a possible similar expansion of the functions available to Uralic abessive suffixes. It is hoped that beginnings of a treatment proposed here may provide momentum towards reconsidering the "differences...in semantics [between the nominal and verbal abessives.]" (79). Kiefer (2015:609) observes that the Hungarian cognate does attach to verbal bases but is restricted to transitive stems with eventive semantics. This is an observation with potential implications for future work on the grammaticalisation pathway for privative marking.

[29]Similarly, Tamm (2015:416) observes that 'abessive negation' in Estonian is a strategy that (unlike the distribution of cognates elsewhere in Uralic) also permits of clausal-type negative (SN-like) uses and carries a 'presupposition of an intention [to instantiate the abessive-marked predicate.]' In view of potential modal analyses of negators mentioned here, the emergence of this reading is extremely interesting.

[30]Perry's (2012:68ff) 2×2 typology of indexicals contrast those that: (A) depend on notions of (i) 'wide' vs. (ii) 'narrow' context to designate and (B) on the basis of context, either designate (i) 'automatically' or otherwise (ii) require appeal to 'speaker intentions'. Those indexical items that require appeal to speaker intention are 'discretionary' indexicals (cf. Kaplan's 'true demonstratives', see Braun (2017) for a general discussion of this literature.)

Nevertheless, d_α can also be supplied by way of a "coda" – *i.e.* that (optional) phrase that, rather than relying on speaker intentions (the defining property of a *discretionary indexical*), *explicitly* restricts the domain of an existential predication. Examples are given for Djambarrpuyŋu in (151), where the 'coda' is underlined.

(151) *Privatives in Djambarrpuyŋu: CODA underlined*

a. *Gapuwiyak* *guya-miriw*
PLACE fish-PRIV

'There are no fish in Gapuwiyak. / Gapuwiyak is fishless.'

b. *Bäyŋu* *guya* *Gapuwiyak (gulun-ŋur)*
NEGQ fish PLACE waterhole-LOC

'There are no fish in Gapuwiyak.'

The availability of coda phrases additionally provides a syntactic location for the subject in the "eventive-privative" sentences that have been described above. In (152), the privative phrase predicates that *events* of a particular type (*viz.* that event described by the privative-marked verb form) are not characteristic of whichever entity (152a) or location (152b) is specified in the coda position.

(152) *"Eventive-privatives" in Djambarrpuyŋu: CODA underlined*

a. *lukanha-**miriw*** *ŋunhi dharpany*
eat.NMLZR-PRIV ENDO

'That tree is not eaten/edible.'

b. ***bäyŋu**n* *dhalakarr* *marrtjinyara-w*
NEGQ.FOC space move.NMLZR-DAT

'There's no space to move≈there's no moving in the space'

Finally, these markers generalise to the point that they are entirely context-independent and serve, effectively, as truth-functional operators (i.e. standard/sentential negators, inverting the truth value of their prejacent (*sc.* that proposition that they modify.))[31] Djambarrpuyŋu *bäyŋu* and the apparent trajectory of Arrernte standard negator *-tyekenhe*, described in §3.5 are likely examples of the (near-)complete instantiation of this pathway. Table 3.3 spells out this hypothesised trajectory, where the transition from NEC stage B to C can be understood as a generalisation in the domain over which the relevant marker is able to quantify.

3.6.3 Conclusion

This chapter has provided diachronically- and comparatively-informed discussion of change and variation in the negative domain from three geographically distant and temporally deep subgroups of the Pama-Nyungan family of Australian languages. Each of these case

[31] Although, as mentioned above, a unified formal account might treat standard negation as a modal operator where the domain of the negative form is reanalysed. A full defense of this perspective is outside the scope of this chapter.

Table 3.3. Change in the domain over which a marker with negative meaning quantifies $(\mathcal{P}_{\langle\sigma,t\rangle} \cap \mathcal{Q}_{\langle\sigma,t\rangle} = \varnothing)$

NEC Stage	Function	Domain	Type
$\boldsymbol{B}$	PRIVATIVE	Properties of individuals	$\langle e, t\rangle$
$\boldsymbol{B{\sim}C}$	EVENTIVE PRIVATIVE	Properties of events	$\langle \varepsilon, t\rangle$
$\boldsymbol{C}$	(STANDARD) NEGATOR	Propositions	$\langle s, t\rangle$

studies suggests nuances and provides further insights into the formulation of the Negative Existential Cycle as discussed in the work of Croft (1991) and Veselinova (2016 a.o). Of particular interest is the relationship between the privative case—which I have argued represents the morphologisation of a negative existential predicate—and standard negation.

The discussion of Thura-Yura (§3.3) shows a likely trajectory where a privative suffix appears to have become a preverbal standard negator *maga*. In Wirangu, this appears to have created the conditions for the recruitment-by-borrowing of lexical material from an unrelated neighbouring language as a new privative.

The section on Yolŋu (§3.4) shows competition and structured variation between two markers, *yaka* and *bäyŋu* — the latter previously having been restricted to 'negative quantifier' functions. Additionally, we have seen comparative evidence that suggests that the privative marker *-miriw* has expanded out of its traditional domain, to the extent that it is now showing signs of also being in competition with preverbal negative particles. Conversely, the Ritharrŋu data show how a distinct sentential negative suffix *-ʔmayʔ* appears to have been borrowed from a neighbouring language; a finding not predicted by (unidirectional) accounts of the NEC.

Finally, §3.5 provided a discussion of SN strategy of negative suffixation in Arrernte verbs, typologically unusual for Australian languages. We recapitulated several morphosyntactic arguments that negated clauses in Arrernte are actually derived (de-verbal) nominal predicates. In view of the peculiarity of this system, this fact of Arrernte appears to provide strong evidence in favour of a trajectory where the standard negation strategy in this language is an erstwhile privative (negative existential) marker *-tye=kenhe* that has completely displaced an older form (and then triggered the recruitment of a new special negator for negative existential predications *-kwenye*).

The negative domains of Australian languages provide an opportunity to nuance our understanding of the NEC, and perhaps grammaticalisation paths more generally. In view of how robustly Australian languages draw a formal distinction between clausal negation (overwhelmingly with a pre-verbal particle) and absence predications (overwhelmingly with a nominal suffix), deviations from this tendency are likely indicators of systemic formal and functional change in the negative domain. To the extent that a diachronic relationship can be drawn between the lexical material used to encode each of these categories, semantic change can likely be inferred from deviations from this pattern. Furthermore, in view of the strikingly distinct morphosyntactic properties of pre-verbal particles and nominal suffixes, the displacement of standard negation markers by negative existentials (*esp.* privatives) calls for an account of this 'functional' cycle, one that foregrounds the possibility of semantic reanalysis and meaning similarity between these categories: indeed as has

been suggested in the foregoing discussion, there is good reason to conceive of a subset relation between existential and standard negation.

Part II

Yolŋu Matha intensionality

This project presents a theory of the temporal and modal expression and the interaction of tense and modality devices on the basis of original data elicited in a number of language varieties spoken in Arnhem Land, Northern Australia.

The primary empirical focus of the dissertation is on Western Dhuwal(a), a Yolŋu language with four verbal inflections that are licensed in a number of contexts not straightforwardly predicted by existing accounts of tense, aspect or modality. On the basis of new data collected from native speakers during fieldwork in Northern Australia, I develop a formal semantic analysis of how this morphological material—in concert with both contextual information and other lexical and grammatical items—contributes to temporomodal expression and displacement in discourse.

Of particular note for theories of temporal and modal expression are two related phenomena: **cyclic tense** and **negation-based mood asymmetries**. Both of these have been documented in previous scholarship, although neither has been explained by existing formal semantic frameworks.

Cyclicity—a phenomenon named by Comrie (1983:91)—refers to cross-linguistically uncommon tense marking systems in which the temporal intervals compatible with given markers are discontinuous. While current theories of temporal expression that have been brought to bear on similar phenomena (accounts based on interactions with situation and/or viewpoint aspect, sequence-of-tense effects and pragmatic shifting), these fail to predict the distribution of Western Dhuwal(a) verbal inflections. I propose a unified, interval-semantic analysis which can be shown to capture the temporal contributions of each marker, a finding that is additionally supported by the language's interval-denoting demonstrative inventory. Here I argue that, while the temporal semantics of these markers ostensibly diverges sharply from that of tense morphology cross-linguistically, this phenomenon in fact points to the semanticisation of universal pragmatic and discourse-structural norms (cf. Culioli 1980).

Additionally, in most contexts, irrealis, future and negative operators trigger a different set verbal inflections ('negation-based mood asymmetry' following Miestamo 2005). I propose an analysis which treats these semantic categories, as they are instantiated in W Dhuwal(a), as a natural class. A consequence of this is a treatment of W Dhuwal(a) inflection as encoding information about tense, mood and assertoric force; a finding that I argue speaks to the porous boundaries between these categories, and one that the inventory of formal semantics can insightfully and elegantly account for.

Consequently, the analysis defended in this dissertation shows that these two properties of Western Dhuwal(a) morphosemantics are epiphenomenal on an inflectional system that grammaticalises interactions between tense and mood; these *prima facie* surprising distributions fall out naturally from a compositional, unified semantics for each of the four inflectional categories.

Finally, on the basis of data from a number of other Yolŋu language varieties, I show that these tense and modal phenomena are innovations that point to a history of contact-induced change between western varieties of Yolŋu and the unrelated languages of Western Arnhem. These innovative varieties are a consequence of the reanalysis of the semantic contribution of an older tense-based paradigm. These meaning change phenomena rebalance the division of labour between pragmatic reasoning and a number of pragmatic operators, giving rise to the diachronic reorganisation (and synchronic variation) in the means of temporal and modal expression across Yolŋu Matha. This semantic change pathway provides additional, diachronic support to theories of conceptual connections between the

temporal and modal domains. *Drawing on data from Yolŋu Matha, a subfamily of Pama-Nyungan spoken in central- and eastern Arnhem Land, this part of the Dissertation provides an amphichronic description and analysis of the Yolŋu Matha verbal paradigm and a discussion of the linguistic devices that speakers use for displacement: temporal and modal displacement.*

ref here to introductory
hapter/s

Yolŋu Matha is a language family spoken in north-central and -eastern Arnhem Land. . As explained in Chapter **??**, *subgrouping of the family remains somewhat controversial, but most treatments understand the it as containing six languages with thirty or so 'clan-lects' distributed between them. For the purposes of this prospectus, I will make reference to the closely related Western varieties of Djambarrpuyŋu (*`[djr]` *Dhuwal) and Gupapuyŋu (*`[guf]` *Dhuwala), slightly further afield Wangurri (*`[dhg]` *Dhaŋu) and Southern variety Ritharrŋu* `[rit]`*; the varieties for which there is the most significant amount of presently available documentation.*

Chapter 4 *contains a general description of the language ecology of Yolŋu Matha and patterns of verbal inflection in Yolŋu varieties, paying particular attention to Djambarrpuyŋu, how it diverges to Djinba, Ritharrŋu and Wangurri, and the puzzles that these paradigms pose for theories of tense and modality.*

Chapter 5 *proposes a formal treatment and analysis of temporal and modal expression in synchronic Yolŋu varieties.*

Chapter 6 *foregrounds 'diachronic thinking' about the comparative Yolŋu data presented here and considers: What might the paths of change and synchronic variation in Yolŋu Matha suggest about the cognitive implementation of displacement operators?*

Chapter 4

The Yolŋu Matha verbal paradigm

The verbal inflectional paradigms of contemporary Yolŋu languages can be reconstructed to proto-Yolŋu (*e.g.* Bowern 2009). Notwithstanding this demonstrated cognacy, there is significant cross-linguistic variation reported in the distributions and 'meanings' associated with the varieties' cognate inflectional categories. Where eastern and southern language varieties are described as having 'basic tense categories' that are 'semantically straightforward' (*e.g.* Heath 1980a on Ritharrŋu:74*ff*), an adequate treatment of the morphosemantics of tense marking in the related Yolŋu languages spoken in western Arnhem Land appears to be much more elusive, notwithstanding the nuanced and detailed descriptions in Wilkinson 2012 and McLellan 1992.

o I want to talk at this oint about adopting a articular (probably ealizational) morphological heory? cb: no

In this chapter, I provide description of verbal inflection across a number of Yolŋu varieties on the basis of data from existing descriptive works (published grammars and related publications) in addition to novel field data collected by the author. For reasons that will become clear, I pay particular attention to the *Dhawu* variety Djambarrpuyŋu (Dhuwal) and the mutually intelligible *Yirritja* variety Gupapuyŋu (Dhuwala). The TMA system for this language is described in §**??**. Subsequent sections provide information on the semantics of neighbouring languages' verbal inflectional systems, particularly as these appear to differ to Dhuwal-Dhuwala.

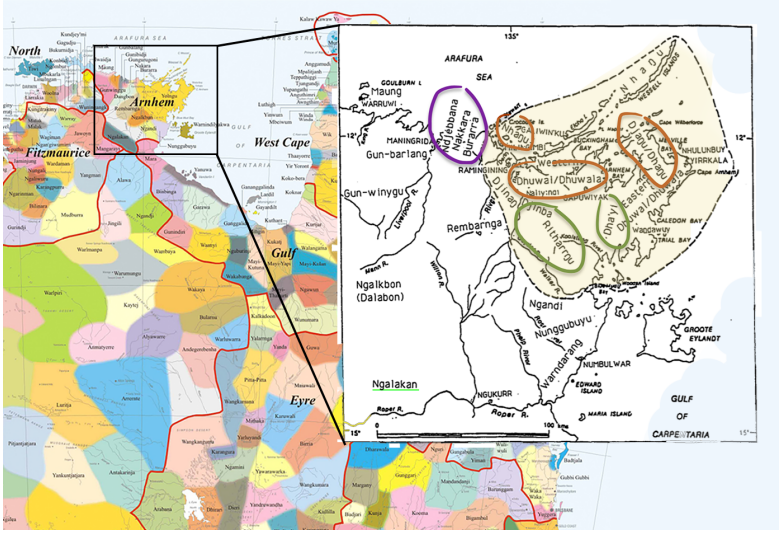
Vill work on acquiring a cer-looking map. Also it ay/probably will turn out is this is better placed in hapter 1 (the basic troduction to Arnhem and.)

TMA distinctions in Dhuwal(a) are encoded in a paradigm that disinguishes four 'inflections', which are cognate with a number proto-Yolŋu inflections according to the reconstructions provided by Bowern (2009). Work on Dhuwal and Dhuwala varieties (notably Lowe 1996, Wilkinson 2012) has eschewed a metalinguistic gloss for these inflections, given the ostensible non-unifiability of their semantics. Both authors appeal to an arbitrary numbering system for the four "inflections", which I follow in this section. In addition to these inflections, the expressive burden of encoding TMA relations is shared by a (closed) class of auxiliaries, which appear to interact with the verbal paradigm.

Further complicating the exposition of this, is the fact that there are a number of *conjugation (sub)classes*: 9 according to Lowe (1996) for Gupapuyŋu, 3 larger classes each with a number of subclasses in addition to "non-inflecting" and (semi-)irregular categories for the closer description in Wilkinson (2012).

In this section, I draw predominantly from existing and novel resources on the Djambarrpuyŋu (comprehensively documented by Melanie Wilkinson (2012)) and Gupapuyŋu (especially with reference to Beulah Lowe's grammar notes and Anita van der Wal's 1992 doctoralthesis). These two central Arnhem varieties are closely related. Additional references are made to the eastern varieties Djapu (Morphy 1983, **?**) and Gumatj. Wilkinson's

Figure 4.1. Traditional language communities in Northern Australia (Horton 1996). **Inset.** Northeast Arnhem land (colourised from Wilkinson 2012:2. Yellow shading indicates the *Yolŋu Wäŋa* (homeland). Brown and green circles indicate the contemporary distribution of Yolŋu languages investigated. Purple circling indicates the neighbouring (but genetically unrelated) Maningrida language family.



proposed phylogeny of Southern Yolŋu is provided (slightly simplified & modified) as Figure 4.2 below. See Chapter **??** for more background.

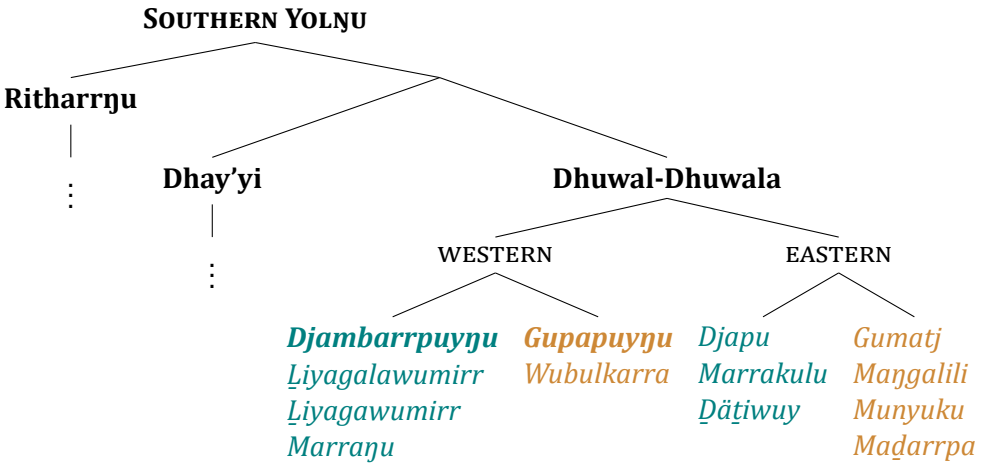


Figure 4.2. Varieties (dialects) of Dhuwal-Dhuwala in the context of the Southern Yolŋu languages (following Wilkinson 2012:13).

4.1 The verbal inflections & their functional domains

As mentioned above, Dhuwal(a) varieties make use of a verbal paradigm with four inflectional distinctions. As discussed in Chapter **??**, varieties of Dhuwal-Dhuwala are mutually intelligible, the primary distinction resulting from a productive apocope rule (Morphy 1977:51, see also Wilkinson 2012:94*ff* for further details.). The formal consequences of

Dhuwal apocope on the verbal paradigm are shown in Table 4.1 below. The table gives examples of the verb paradigm for each of the major Djambarrpuyŋu conjugation classes as described by Wilkinson (2012:306ff) (parentheses give the corresponding verb group number assigned by Lowe (1996) for Gupapuyŋu.)

f course I can provide more etailed information (the ubclasses) but that feels ke it'd be better appended? he comparative preadsheet i've ade/Claire's 2009 stuff has ost of this formative data... **ote: Andrea Simms rongly suggests more xposition of the formal aradigm**

Class	*Example*	I	II	III	IV
Ø (2)	*marrtji* 'go'	*marrtji*	*marrtji*	*marrtji**n(a)***	*marrtji**nya***
$Ø_{rr}$ (?)	*waṉḏirr(i)* 'run'	*waṉḏi**rr(i)***	*waṉḏi*	*waṉḏi**n(a)***	*waṉḏi**nya***
N (5)	*l̪upthun* 'wash'	*l̪uphtu**n***	*l̪upthu**rr(u)***	*l̪upthu**rr(una)***	*l̪upthu**na***
Ŋ (7)	*nhäma* 'see'	*nhä**ma***	*nhä**ŋu***	*nhä**ŋal(a)***	*nhä**nha***

Table 4.1. Examples of the paradigm of four morphological TMA inflections in Djambarrpuyŋu [djr] and (Gupapuyŋu [guf] resyllabification in parentheses).
[djr] data from Wilkinson (2012); [guf] data from *Gupapuyŋu* (**?**).

In the first paragraph of this section, I alluded to Beulah Lowe's eschewal of a "semantic description" for each of the four inflectional classes. Melanie Wilkinson follows this system in her 1991 grammar and I will follow them here. Below I provide examples of the functional domains of each of the four inflections in Dhuwal-Dhuwala. Inflections are glossed with the bold-faced Roman numerals given in Table 4.1. This section focuses on the interpretation received by inflections in simple sentences (*sc.* matrix clauses) – complex sentences and predications are investigated in further detail in §4.7.

Table 4.2, adapted from Wilkinson (2012:336) summarises the metalanguage decisions made by other authors in their attempts to describe Dhuwal(a) varieties.

	I	II	III	IV
Wilkinson 2012 (Djambarrpuyŋu)	First	Second	Third	Fourth
Lowe 1996 (Gupapuyŋu)	Primary	Secondary	Tertiary	Quartenary
Tchekhoff and Zorc 1983 (Djambarrpuyŋu)	Base	Future	$Past_1$	$Past_2$
Heath 1980a (Dhuwal)	Pres/Fut	Fut/Imp	Past	Past Remote
Morphy 1983 (Djapu)	Unmarked	Potential	Perfective	Past Non-indicative

Table 4.2. Summary of metalinguistic descriptors for the four inflectional classes in a number of Dhuwal/Dhuwala varities, adapted from Wilkinson (2012:336).

4.1.1 The Primary inflection

The 'primary' inflection (**I**), cognate with inflections in other Yolŋu languages which have been described as "unmarked" or "base", surfaces in predications about the present, past and future. Here I provide examples of **I**-inflected clauses receiving each of these temporal interpretations.

ow for both of these (and i uspect all sentences in this ssection) context ought to e modulable s.t. a on-present reading is vailable. This an/should/will be tested in he field

(153) *Present-reference encoded with **I***

a. *Ŋunhi-y* *ŋunhi* *l̪irramu* ***nhina*** *ga*
ENDO-ERG TEXD man sit.**I** IPFV.**I**

'There that man is sitting.' (Tchekhoff and Zorc 1983:856)

b. *Ŋarra ga* ***l̪uka*** *gapu (dhiyaŋu bala)*
1s IPFV.**I** consume.**I** water ENDO.ERG then

'I'm drinking water at the moment.' [DhG 20190405]

The sentences given in (153) show the compatibility between present temporal reference and the **I** inflection: in both cases, the event described by the predicate (*nhina* 'sit.**I**' and *marrtji* 'go.**I**') is understood as being contemporaneous with speech time. Both sentences receive event-in-progress readings (also co-occurring with explicit aspectual marking, see §4.4 for more.)

it a shitty idea to use olour coding for more ormatting/highlighting ptions? I want to resolve old for the verbforms hemselves but would like to e able to second-order mphasise on-paradigmatic things like FAs, aspectual ops...

(154) *Past-reference encoded with **I***

a. *ga* ***ŋayatham*** *ŋunha baṉ'thula-wuy ŋayambalk*
and reach.**I** DIST PLACE-ASSOC place

'And (then we) reached the place (associated with) Baṉthula.'
(Wilkinson 2012:461)

b. *d̪irramu-wal yothu-wal bäpa-'mirriŋu-y rrupiya barpuru djuy'yu-**n***
man-OBL kid-OBL father-PROP-ERG money yesterday send.**I**
*märr barpuru ga barpuru **buna**-ny dhiyal-nydja*
somewhat yesterday and yesterday arrive.**I**-PROM PROX.ERG-PROM

'The father sent money to the boy recently and it arrived here yesterday'
(Wilkinson 2012:343)

Additionally, the sentences given in (154) show compatibility between **I** and past time reference. For both examples the events described by the predicates (e.g. the seeing event described by *nhäma* in (a)) *precede* speech time. Similarly, the two past events in (b) both receive **I** inflection. The instantiation times of both of these events are restricted by with *barpuru* ≈ 'yesterday. – frame adverbials of this type are discussed in some detail in §**??**.

(155) *Future-reference encoded with **I***

a. *yalala ŋarra dhu nhokal lakara-**m***
later 1s FUT 2s.OBL tell-**I**

'Later (today) I'll tell you.' (Wilkinson 2012:373)

b. *dhiyaŋ bala walal dhu **buna**, yalala*
now 3p FUT arrive.**I** later

'They are coming later today.' (Wilkinson 2012:256)

c. Deontic force with *dhu*+**I** (see §4.3)

*Way! Nhe dhu gurruka-**m** helmet! Rom ga* ***waŋa**.*
Hey! 2s FUT wear-**I** *helmet* law IPFV.**I** say.**I**

'Oy! You wear a helmet! The law says so! [AW 20170730]

ctually, W claims this is mminent action" so we eally just have a futurate se of **I** without *dhu* nteresting data point in self) This can probably ove to the section on ture marking (either **I** or ***hu***)

vidence of infelicity of *hu*-less future readings? I ctually kinda doubt on the asis of Tonnhauser, ohnemeyer's work that is is going to be a hard onstraint

d. 'Imminent action' without *dhu*

%* *ŋarra marrtji-n* ***dhiyaŋu****-n* ***bala***
1S go-SEQ **PROX.ERG**-SEQ **MVTAWY**

'I'm going now.' (Wilkinson 2012:256)

Finally, the examples in (155) above, show the compatibility of **I**-inflected verb forms and future temporal reference. In both sentences, the event described by the predicate is understood to obtain in the future of speech time (modulo additional constraints on imminence/immediacy described below). In these sentences the presence of FUT marker *dhu* is apparently obligatory in order to establish future reference. (Although according to Wilkinson (2012:256) (155d), a futurate interpretation is ostensibly available. This use is unavailable to Ramingining speakers.

4.1.2 The Secondary inflection

Like **I**, the Secondary inflection (**II**) has a range of uses. It is notably obligatory when predicating of future times beyond the current day and is the main strategy for forming imperative sentences.

(156) *Future-reference encoded with **II***

a. Co-occurring with *dhu* 'FUT'

yalala-ŋu-mirri-y *ŋula nhätha* *ŋarra* *dhu* *nhokal* *lakara****-ŋ***
later-*ŋu*-PROP-ERG sometime 1S FUT 2S-OBL tell-**II**

'I'll tell you sometime later on' (Wilkinson 2012:346)

b. Future interpretation independent of *dhu* 'FUT'

ŋayi *boŋguŋ* ***nhini*** ***ŋäku*** *ŋarra-ny* *ŋunhal* *yirrkala*
3S tomorrow sit.**II** hear.**II** 1S-PROM DIST-LOC PLACENAME

'She'll be there at Yirrkala tomorrow, listening to me' (Wilkinson 2012:340)

c. Infelicity of **I** with non-today future

Barpuru *goḏarr* *ŋarra* *dhu* *nhä(****-ŋu/*********-ma)***
funeral tomorrow 1S FUT see(-**II**/*-**I**)

'I'll see the funeral tomorrow' [AW 20180730]

The two sentences in (156) show how **II** is used to establish future temporal reference. The conditions on the (non-)appearance of FUT-marker *dhu* are unclear at the present time (see §4.3 for more), but future-readings with **II** do not appear to be reliant on this auxiliary (cf. the data in (155) above). A notable contrast between (155a) and (156a) is the apparently obligatory retrieval of a TODAY-reference time for **I**-inflected futures, as against a (probable) BEYOND-TODAY-reference time for **II**-inflected futures.[1] Effectively, this distinction seems to be one place where the grammar of Dhuwal(a) grammaticalises "temporal

[1]Wilkinson (2012:347) gives an example of a speaker using a *dhu*-**II** structure in the context of a narrative she is telling, signalling that she 'will (return to the time of the old people).' Wilkinson takes this as evidence of an association between **II** and the irrealis. This generalisation is pursued in detail in the next chapter of this dissertation.

remoteness" (Comrie (1985), Dahl (1985) referred to elsewhere in the literature as 'metrical tense' e.g. Chung and Timberlake 1985:204).[2]

would be good to get entences with richer ontext (i.e. an established me of instantiation for the rejacent (tomorrow, mminently etc...)) This said e can probably assume hat the we're talking about mmediate future here... Is **I** compatible with this? here's not much more to y here until I have speaker dgments on this question.

(157) *Ŋarra ŋuli bäynha* ***dhiŋgun*** *ŋawulul-yu*
1s HYP? MOD? die.**II?** smoke-ERG?

'I might die from the smoke.' (Buchanan 1978:164)

(157) shows the compatibility of **II** with a future-oriented possibility reading. The modal particles *ŋuli* and *bäynha* are responsible for the 'weakening' or 'downtowning' of the speaker's commitment to the prejacent proposition. Modal operators are described in §4.5.

(158) *Imperative force with* ***II***

a. *wäy! gurtha ŋunha, nhawi, ḏutji män-**ŋu**, bakmara-**ŋu***
hey! fire(wood) DIST what's.it firesticks get-**II** break-**II**

'Hey! Get that firewood, what's it, those firesticks, and break them.'
(van der Wal 1992:114)

b. *yaka walala-ŋ buku-bakamara-**ŋ***
NEG 3p-DAT head-break-**II**

'Don't answer them!' (Wilkinson 2012:360)

c. *nhä-**ŋu** nhanŋu dhurrwara!*
look-**II** 2s.DAT door

'Look at her mouth!' [AW 20180731]

The sentences in (158) show the imperative function of **II**-inflected clauses. Shown in (158b), negative imperatives (probibitives) are treated identically.[3]

4.1.3 The Tertiary inflection

The Tertiary inflection (**III**) is generally associated with predications about the PAST. An important caveat, however, is that this inflection is infelicitous when describing RECENT events instantiated BEFORE THE CURRENT DAY. The examples in (159) below show the compatibility between **III** and a reference time that is 'earlier today.'

how the compatibility of **III** ith IPFV by adding some xamples with *gana*. Perhaps a minimal pair, hough this might be better laced below.)

(159) *TODAY PAST and the* ***III*** *inflection*

a. *Gäthur ŋayi* ***marrtjin*** *räli Galiwin'ku-ŋur*
today 3s go.**III** hither PLACE-ABL

'[Earlier] today he came from Galiwin'ku.' (Buchanan 1978:150)

b. *Bili ŋayi* ***marrtjin*** *dhipuŋur natha-ŋur nyan'thuna-ŋur*
COMPL 3s go.**III** PROX.ABL food-ABL eat.**IV**-ABL

'He has already gone from having lunch here.' (Buchanan 1978:150)

[2] Although Heath (1980a:39) suggests of the **II** future in Dhuwal Proper (his FUT/IMP) that this form encodes a type of "normative nuance" (a clear extention of imperative flavour into future assertions.)

[3] Although the use of privative-marked nominals is another common strategy, se.e Phillips (2019), Phillips and Kotek (2018) for more.

c. Infelicity of **III** with RECENT PAST

barpuru *ŋarra* *nhä**(-ma/*-ŋala)*** *ḏetuŋ*
yesterday 1s see**(-I/#-III)** buffalo

'I saw a buffalo yesterday.' [MD 20180802]

d. Infelctity of **I** with TODAY PAST

gathura *ŋarra* *nhä**(#-ma/-ŋala)*** *ḏetuŋ* *dhukarra-ŋura*
today 1s see**#-I/III** buffalo road-LOC

'I saw a buffalo today' [MD 20180802]
COMMENT. Event could have happened this morning or ten minutes before speech time.

otentially look for a ref for
is or provide data that
akes this unambiguous...

(159a) shows the compatibility between temporal frame adverbial (TFA) *gäthur(a)* 'today' and **III** in `djr`, which leads to an temporal interpretation of 'earlier today.'[4] However even in the absence of a TFA, the event described in (b) is interpreted as having been instantiated EARLIER.TODAY/in the immediate past of speech time. **III** cannot, however, be conveniently described as a 'hodiernal past' (cf. Mwera?, also Comrie 1985:86), as the data in (160) make clear.

(160) *REMOTE PAST and the **III** inflection*

a. *nhä* *nho-kiyin-gal* *wäwa-'mirriŋu-y* *warkthu-rr* *ŋäthil* *rarrandharr-yu*
what 2S-EMPH-OBL bro-PROP-ERG work-**III** before dry season-ERG

'What did your brother do last summer?' (Wilkinson 2012:343)

b. CONTEXT. The speaker is describing a locality as it was in her youth.

märrma' *ga-**n*** *malwan-dja* *dhärra-**n*** *yindi* *maṉḏa-ny*
two IPFV-**III** hibiscus-PROM stand-**III** big 3d-PROM

'Two big hibiscus flowers were (growing).' (Wilkinson 2012:339)

ve taken some liberties
ith the glossing here,
eath has the second verb
al'yuna as **I** with a SEQ
arker... to investigate
rther perhaps

c. CONTEXT. A man is telling a story from long ago . His friend's dog has spotted a water goanna.

...ŋunhi *wurkaḏi-y* *nhä-ŋal-na* *ŋinya* *dharpa-lil-a* *ŋal'yu-na* *nhäwi*
ENDO NAME-ERG see-**III** 3S.ACC tree-ALL-SEQ ascend-**III** whatsit
wan'kawu-ya
water.goanna-ANA

'*Wukaḏi* watched it scramble up into a tree, the water goanna.' (**?**:193)

Unlike the HODIERNAL temporal interpretations that the sentences in (159) receive, the two sentences in (160) are evaluated to obtain in the 'REMOTE PAST.' In (160a), the instantiation time of the predicate is restricted by two frame adverbials: *ŋäthil(i)*, which picks out a time 'in the distant past; prior to/earlier than (some other predicate)' (Wilkinson

ay be easier just to get a
milar non-interrogative
ntence to do what 160b
oes

[4]Note however that the reckoning of TFA *gäthur(a)* differs to that of English and other familiar languages as shown in (165a), where *gäthur munhawa* 'today nighttime' is interpreted as "last night" and still triggers **III** marking on the verb.

2012:158) and *rarrandharryu* 'dry season':[5] The cooccurrence of these expressions restricts the predicate being questioned to *a prior dry season*. Conversely, the declarative sentence in (160b) requires no adverbial specification. A REMOTE PAST interpretation arises as a result of the **III** inflection alone, which is precised pragmatically by the discourse context (*sc.* a narrative that the speaker is telling about her childhood.) In principle, 160b ought to be able to retrieve a same-day past interpretation as well, with sufficient contextual support.

rovide some negative
licity judgments

his discussion of the
aningrida treatments of
rame' and 'tense' may be
etter placed • entirely in
e lit. review, • after the
eneral data discussion of
flections, or • in the
llowing chapter.

The ostensible 'discontinuity' of the times predicates receiving **I** and **III** inflection can refer to has been described in preceding literature as **CYCLIC TIME REFERENCE** (Comrie 1983:88). In her influential treatment of Burarra [bvr], Glasgow (1964) draws a distinction between 'tense' and 'frame of reference' ('timescale' for Green 1987:48). The interaction between these is taken to give rise to a reference interval. This analysis has been adopted and developed by others working on Maningrida languages (Eather (2011:165) for Nakkara [nck], Green (1995) for Gurr-goni [gge] and McKay (2000).) This is schematised in Table 4.3. The following chapter further treats and formalises this analysis.

		FRAME	
		today	**before today**
INFL	**I**	now	yesterday/recently
	III	earlier today	long ago

Table 4.3. A Glasgow (1964)-style analysis of **past-time restrictions** introduced by the verbal inflections, adapted for the Dhuwal(a) data. **I** and **III** inflections correspond to Eather's **contemporary** and **precontemporary** "tenses" ("precontemporary" is Eather's (2011:166) relabelling of Glasgow's "remote" tense.)

lso the get
ck/psych/phys condition
erbs, some examples also
Buchanan:168

Additionally, a set of psychological predicates that are frequently translated into English as present-tensed stative verbs appear with **III**. Examples are given in (161).

(161)

a. *ŋarra dhuwal/dhika djawaryu-**rr**/rerrikthu-**rr**/djanŋarrthi-**n***
1S PROX/INDEFP be.tired-**III**/be.sick-**III**/be.hungry-**III**

'I'm (a bit) tired/sick/hungry' (Wilkinson 2012:278)

eeds elicitation work,
ppears to be a today-past
ning? Are these predicates
vailable with TFAs
rpuru?, with *ga*? And the
ther inflections??
est entailments also: *??I
as tired this morning but
m not now??*

b. *bili djawar'yu-**rr**-a*
CPLV be.tired-**III**

'They're already tired' (Wilkinson 2012:365)

c. *ŋarra dhu dhuwal lakara-m ɳunhi nhä ŋarra nhä-**ŋal** dhiyaŋ bala*
1S FUT PROX tell-**I** ENDO what 1S see-**III** PROX.ERG MVTAWY

'I'll tell you what I see right now.' (Wilkinson 2012)

Wilkinson (2012:365-6), in effect, suggests that the frequent exponence of **III** in these predicates of "emotional and bodily states" is a function of their lexical semantics. Unlike

[5]The suffix *-Thu* (*-yu* as a postsonorant allomorph), glossed here as ERG is used to mark ergative NPs as well as instrumental (INSTR) NPs and to form TFAs out of nominals TEMP.

their English translations, with **III**, these predicates can be understood as 'achievements' (to borrow from Vendler's Aktionsart taxonomy). In these cases then, **III** is licensed because *djarwaryu**rr(u)*** refers to a state-change before speech time. Consequently, the licensing of **III** in (161c) above is a consequence of a completed *seeing* eventuality immediately prior to the *telling*-event described in the matrix clause. This phenomenon is investigated in detail in §5.1? below.

4.1.4 The Quaternary inflection

this XLinguistic note orth anything? If so a ouple more examples ould be nice.

The Quartenary inflection (**IV**) has a broad range of uses in Dhuwal(a) varieties that correspond in part to categories described in Australian languages including *past potentialis* (Heath 1980b), *past counterfactual* McKay (2011), *[past] irrealis* (Austin 1998:159) *etc.* It is used primarily with modal auxiliaries in order to describe past habituals (162) with *ŋuli* and past irrealis event description (with *balaŋ* a.o.) as in (163) including counterfactuals.

heck ft for (b)

(162) a. *Ŋayi ŋuli märra-**nha** ŋunhi meṉḏuŋ-nha*
3S HAB get-**IV** ENDO snail-ACC

'She would (used to) get (collect) snails' (Buchanan 1978:147)

b. *...ŋorra-**nha** walal ŋuli marrtji-**nya** ŋunhi-li-yi, galku-**na** walal ŋuli*
lie-**IV** 3p HAB go-**IV** TEXD-LOC-ANA wait-**IV** 3p HAB
*ga-**nha** gapuw wirwiryu-**na**+ra-w*
IPFV-**IV** water-DAT turn-NMLZR-DAT

'They would be lying there, they would be waiting for the water to stir.'
(DB Djon 5:4)

(163) a. CONTEXT. Speaker had a toothache.

*barpuru balaŋ ŋarra bala dentist-kal marrtji-**nya** dhiyak*
yesterday IRR 1S MVTAWY dentist-OBL go-**IV** PROX-DAT

'Yesterday I should have gone to the dentist for a filling'
(Wilkinson 2012:353)

b. *Yaka balaŋ nhe marrtji-**nya** Darwin-lil*
NEG IRR 2S go.**IV** Darwin-ALL

'You should not go to Darwin.' (Buchanan 1978:164)

These data demonstrate the relationship between the **IV** inflection and combinations of past temporal reference and various modal and aspectual operators. These categories are treated in more detail in §4.5 below. Furthermore, the data presented so for in this section are predominantly positive sentences. §4.2 describes striking interactions between negation operators and verbal inflectional categories in some Dhuwal(a) varieties.

4.2 Sentential negation: *yaka* & *bäyŋu*

Djambarrpuyŋu has two negative particles, *yaka* and *bäyŋu*, which are deployed for standard negation (i.e. those particles whose effect is to reverse the truth value of a given propo-

sition.) The particles differ in that only *yaka* is used to generate negative imperatives (prohibitives) and only *bäyŋu* is found in negative existential/quantificational contexts (see **?** for further discussion of semantic change in the Yolŋu negative domain.) Remarkable, however, is the complex interaction between sentential negation and verbal inflection.

Descriptively, negation appears to trigger a "switch" from the 'realis-aligned inflections' (**I** and **III**) to their 'irrealis counterparts' (**II** and **IV**), effectively evincing a mood-based distinction that is neutralised in negated sentences (following Wilkinson 2012:356). This is schematised below in Table 4.4.

	POLARITY	
	−NEG	+NEG
	I **II**	**II**
	III **IV**	**IV**

Table 4.4. Neutralisation of **I** and **III** inflections under negation.

(164) *Present/recent.past **I** expones as **II** under negation*

a. Negated present-tense sentence receives **II** marking
CONTEXT. Speaker is trying to read from a computer screen.

*bäyŋu ŋarra **gi** nhä-**ŋu***
NEGQ 1S IPFV.**II** see-**II**

'I can't see (it).' [AW 2018030]
COMMENT. *nhäŋu* ('see.**II**') could also mean yesterday, in past.

b. *yaka **gi** **biyak** rom waŋ-**i***
NEG IPFV.**II** do.thusly.**II** law say-**II**

'That's not how the law is/what the law says.' (Wilkinson 2012:357)

c. Present-tensed sentence with **I**

*Nhaltja-**n** **ga** limurru-ŋgu-ny rom waŋ-**a**?*
do.how-**I** IPFV.**I** 1P.INCL-DAT-PROM law say-**I**

'What does our law say?' (DB Luk 14.3)

d. Negated (recent) past-tensed sentence receives **II** marking.
CONTEXT. A recent hunting trip, narrated in **I** for corresponding positive descriptions.

ga yaka ŋayi ŋunhi dharyu-rr biyak djin'tjiŋdhu-rr
and NEG 3S ENDO rain-**II** do.thusly.**II** rain lightly.**II**

'...and it did not rain lightly' (Wilkinson 2012:357)

(165) Past-tensed sentences exponing with **IV** under negation

a. *bäyŋu ŋarra gäthur ŋorra-**nha** manymak-ku-**nha** munhawu*
NEGQ 1S today lie-**IV** good-TR-**IV** nighttime

'I didn't sleep well last ni ght' (Wilkinson 2012:357)

b. *gathur munhagumirr ŋarra nhä-**ŋal** warrakan*
today morning 1S see-**III** bird

'I saw a bird this morning' [FW 20180802]

c. *gathur munhagumirr bäyŋu ŋarra nhä-**nha** warrakan*
today morning NEG 1S see-**III** bird

'I didn't see a bird this morning' [FW 20180802]

d. CONTEXT. Speaker has dropped a coin.

Way! Bäyŋu ŋarra nhä-nha?
Hey! NEGQ 1S see-**IV**

'Ah! Did you see (it)?' [AW 20180830]

e. Negated (distant) past receives **IV** marking.
CONTEXT. The text describes remote past events, narrated in **III** for corresponding positive descriptions

*ŋayi-ny muka bäyŋu yan yolŋu-ny yurrumdhu-**na***
3S-PROM okay NEGQ EMPH person-PROM gather-**IV**

'Not all the people had gathered together' (Wilkinson 2012:357)

's not clear how I can easily et a the status of this ternation via elicitation esp. if its intraspeaker..?) or hether I should just bstract away from it. My nformants so far seem to ave consistently respected his alternation.

Notwithstanding this generalisation, Wilkinson (2012:358*ff*) notes that there exists a considerable amount of synchronic variation in the formal (neutralising) relation between negation and inflection. Van der Wal (1992:110) in fact reports no asymmetry in her study of Gupapuyŋu, noting that it is just as valid to predict the affirmation of a proposition with future temporal reference as it is to predict the negation of such a proposition.' (166) gives examples of 'unexpected' realis-aligned inflections appearing under negation.

(166) Exponence of **I** and **III** under negation.

a. *ga yaka-na ŋarra yurru bulu roŋiyi-**rri***
and NEG-PROM 1S MOD again return-**I**

'And I will not come back again.' (van der Wal 1992:110)

suspect a good way of xcluding this data will be to est its acceptability with my onsultants. I expect Albert, aith will reject all of these. so is this whole discussion omething that should be in or Ch.6 rather than in ody here?

b. *bäyŋu ŋayi ga dhuwal nhina dhiyaŋu-ny bala*
NEGQ 3S IPFV.**I** PROX sit.**I** PROX.DAT-PROM MVTAWY

'She isn't living here now' (Wilkinson 2012:358)

c. *gurrupa-**r** muka ŋarra ga-**n**, yurr bäyŋu-n ŋayi ga-**n** l̪uka-**n**,*
give-**III** OK 1S IPFV-**III** but NEGQ 3S IPFV-**III** eat-**III**
ŋatha-ny
food-PROM

'I was giving (him) the food but he wasn't eating it' (Wilkinson 2012:358)

Generally, there seems to be a perception (Melanie Wilkinson *pers. comm.*, independently supported by consultant AW [20180830]) that the maintenance of **I** and **III** (the 'REALIS-aligned' inflections) under negation is a characteristic of *Miwatj* varieties of Dhuwal-Dhuwala (i.e. those spoken in towards the East.) This is suggestive of an areal/contact phenomenon, a siutation to be further discussed in Chapter 6.

here's a great comment om my consultant in her anslation of a negative entence. When asked why ***i*+II** was used instead of ***a*+I** she claims 'not appening yet' 20180802-8min)

Wilkinson (2012:356) notes that "[she has] not been able to determine a functional basis for this alternation." Nevertheless, in his typological survey of standard negation, Miestamo (2005:558) identifies a cross-linguistically attested mood-based asymmetry where negative marking triggers the appearance of the irrealis or other "nonrealised"-type modal markings. This phenomenon seems to be particularly well-represented in the languages of the Top End, functional explanations generally emphasising the fact that negated predicates '[belong] to the realm of the non-realized', a domain associated with irrealis marking (Miestamo 2005:225, cf. McLellan 1992:195, see also Phillips 2019). These ideas are explored in further detail in Chapter 5 below.

Wilkinson (2012) also suggests that there is insufficient cross-linguistic data to assess a the diachrony (and potential areal diffusion) of this asymmetry (356), although provides a concise review of other authors' observations of Yolŋu varieties (359-60). Data about the interactions between polarity and verbal inflection are provided in the following sections and the question of the development of these asymmetries is treated in Chapter 6 below.

4.3 *dhu*

dhu (and apparent synonym/dialectal variant *yurru*) is treated as a FUT-particle by Wilkinson (2012:346), Lowe and **?**:39,46. Also available are deontic and epistemic modal readings (such that van der Wal (1992:110) glosses this particle as MOD.) These uses of *dhu* are shown in (167-168) below.

(167) Future reading of ***dhu***

yaka-na ***dhu*** *limurru roŋiyi-**rri*** *Yirrkala-lili*
NEG-FOC **MOD** 1p.INC return-**I** Yirrkala-ALL

'We won't return to Yirrkala' (Van der Wal 1992:125)

(168) *Modal readings of* ***dhu***

a. *Deontic necessity reading of* ***dhu***
CONTEXT. Speaker's 16 year-old *waku* has just got his driver's license.

gaŋga nhe ***dhu*** *ga gäma mutika-y*
slowly 2s **FUT** IPFV carry.**I** car-ERG

'You should/must drive slowly.' [FW? 20180802]

icit "you should but you on't have to" future deontic presumbaly kes ***dhu*+II**

b. *Circumstantial necessity reading of* ***dhu***
CONTEXT. Child drank a lot of water before boarding a now mid-flight aeroplane.

Bäpa, gupa ŋarra dhu (bala) waryu-n!
FA water 1s FUT (MVTAWY) urinate-**I**

'Dad, I need to wee now!' [AW 20180830

he ambiguity between circ ec and fut readings here is uper interesting because it eally throws the polysemy f *bala* into relief as picking p either $t*$ or $w*$

c. *Deontic impossibility reading of* NEG+***dhu***

ga yaka-dhi walala ***dhu ga*** *yatjun-**dhi***
and NEG-ANA 3p **MOD** CONT.**I** bad-**I**

'And they must not be disobedient' (Van der Wal 1992:125)

d. *Circumstantial impossibility reading of* NEG+***dhu***
CONTEXT. *Waku* has broken his leg and can't go dancing with his friends.

bäyŋu ŋarra ***dhu*** *marrtji disco-lil... bili bäyŋu ŋarra gi marrtji*
NEGQ 1s **FUT** go.**I|II** disco-ALL because NEGQ 1s IPFV.**II** go.**II**

'I can't go to the disco because I can't walk.' [FW? 20180802]

Unlike the Djambarrpuyŋu data in (156) above that inspire Wilkinson's descption, **?**:39 claims that these particles do not co-occur with **II** in the Dhuwal varieties he describes.

Dhu has an additional modal/aspectual component. Wilkinson claims that it is used in conjunction with **I** to describe 'situations which pertain...to current lifestyles or activities... that hold in the present.'[6] An example of this use is given in (169).

(169) a. *dharpa-y ŋayi* ***dhu*** *marrtji...*
tree-ERG 3s FUT walk-**I**

'They walk with a stick...'

b. *dharpa-mirr napurr* ***dhu*** *lakara-m yolŋu-ny, ŋayi* ***dhu*** *ga marrtji*
tree-PROP 1p.EXCL FUT tell-**I** person-PROM 3s FUT IPFV.**I** go.**I**
bitja-n gä-nha-mi-rr
do.thusly-**I** bear-**IV**-R/R-**I**

'We call a person "stick-having", who goes around bearing themself with a stick'
(Wilkinson 2012:411)

Wilkinson (2012:346) suggests that this use of the TODAY FUTURE (*sc. dhu*+**I**) to describe potential contemporary specific situations', can be accommodated by extending the relevant "time domain" of **I** (i.e. "today nonpast") to **NOWADAYS**. This notion is crucial to the analysis that I lay out in Chapter 5 below.

I suspect that *dhu* isn't an absolute future marker:

[6] Note the possibility of a felicitous translation of these sentences with *will* in English as well.

is makes sense from a nctional perspective but i spect heath's constraint is o strong and the Mel gets s what we need. Given the elative temporal nambiguity of **II**, it's robably just that explicit TS are more helpful in **I** ontexts.

he big question to answer this sssection is what the ctual status of *dhu* is – does pick out an absolute future terval? or one relative to a gher *t*? Is it a prospective spect marker? The Heath sagreement should be asy to deal with (if it's even he right characterisation.)

(170) *Bala ŋayi marrtji-nya-mara-ŋala lakara-ŋal-nydja dhäwu-ny birrŋ'mara-ŋala*
then 3s go-**IV**-TR-**III** tell-**III**-PROM story-PROM spread-**III**
[ŋunhi-ŋu-wuy-yi yothu-walaŋu-wuy-nydja] yolŋu'-yulŋu-wal-nydja
[ENDO-*ŋu*-OBL-ANA child-OBL-DAT-PROM] people-DAT-PROM
bukmak-kal-nha, [ŋunhi walal ŋuli ga-nha gatjpu'yu-na ga dhukarr-nhäma
all-DAT-ACC [TEXD 3p HAB IPFV-**IV** hope-**III?** IPFV road-see.**I**
*ŋuriki-yi], ŋunhi **dhu** God-thu dhawaṯmarama-n ŋunhi-yi wäŋa-ny*
TEXD.DAT-ASSOC] TEXD **FUT** God-ERG expel-**I?** TEXD-ANA land-PROM
garrpi-na-mirri-ŋur-nydja rom-ŋur mala-ŋu-ŋur
bind-**IV**=PROP-ABL-PROM law-ABL group-*ŋu*-ABL

'Then she went about spreading the news [of that child] to all the people [that were hoping and looking out for it], that God would free the place from the laws that bound it' Godku dharuk p20

ther big question is how bligatory *dhu* is in matrix auses to get the future eadings.

So *dhu* in (170) is picking out a time in the absolute past, but the future of a reference time established in the matrix clause. This suggests that *dhu* relates event time (here the FREE predicate) and a ref (or top) time set by the embedding predicate. Note that it also seems to have coupled with a **I** inflection (although this isn't super clear.)

4.4 Aspectual auxiliaries

Overt aspectual marking is grammaticalised in a number of ways. This subsection is further divided; I discuss Djambarrpuyŋu grammatical strategies for marking the two major 'inclusion' aspects – the imperfective $\left(i \sqsubseteq \tau(e)\right)$ and perfective $\left(i \sqsupseteq \tau(e)\right)$ — seperately below.

4.4.1 Imperfectivity

The most commonly occurring strategy for explicitly indicating imperfectivity is the auxiliary *ga* 'IPFV', which "agrees" with the inflection of the verb that it modifies (*i.e. ga/gi/gan(a)/ganha*.) **?**:46 claims of the Dhuwal varieties he investigates that for **I**-inflected utterances, '*[ga]* specifies present tense and *[dhu]* specifies future tense.'[7] Given the close association between present-tensed utterances and imperfectivity (see Bybee et al. 1994:141, `ref`, `ref`, `Deo`), there does seem to be a strong tendency for present-reference to associate with *ga* as in (153a), although the presence of an imperfective auxiliary is neither a necessary nor sufficient condition for the emergence of present-readings.

(171) *yo, ŋarra yawungu ŋanya nhäma, ŋayi **ga** djäma ḏo'ŋur ŋunha Baṉ'thula*
yes 1w yesterday 3s.ACC see.**I** 3s **IPFV**.I work store DIST PLACE

'Yes I saw him yesterday, he was working at the store in Baṉ'thula.'
(Wilkinson 2012:363)

[7] **?**:46 notes that [*gan*] occurs "usually with [**III** or **IV**] inflection, indicating durative" but he makes no reference to compatibility of this auxiliary with future and does not go so far as give a completely aspectual analysis.

Wilkinson (2012:363-7) carefully shows the compatibility of *ga* with all four inflectional categories and receiving past, present and future interpretations. I take this (parallel) distributional data as a clear demonstration that this auxiliary does not directly encode tense.[8]

Similarly, *marrtji+INFL* 'go' alternates with auxiliary *ga* 'IPFV' (perhaps in a variety of serial verb construction?) to encode another shade of imperfective meaning. Wilkinson (2012:369) suggests that this points to a possible link between describing a motion event and describing other events with internal composition (a possible definition for imperfective viewpoint aspect, see Comrie 1976:24). Predicates of motion are cited as a potential lexical source for progressive grams by Bybee et al. (1994:128). Examples of *marrtji* functioning as a type of imperfective marker are given in (172) below: (a) with eventive predicates and (b) with a stative predicate.

ow would serialisation eally be distinguished from uxiliarisation?

(172) a. *walal* ***marrtji-n*** *lakara-ŋal* *ŋanapurru-ŋ,* *ŋunhi* *ŋanapurru-ny*
3p **go-III** tell-**III** 1p.EXCL-DAT ENDO 1p.EXCL
walal ***marrtji-n*** *malawuma-r* *biṯthu-rr* *ŋanapurr* ***marrtji-n***
3p **go-III** have.children-**III** rear-**III** 1p.EXCL **go-III**
ŋuliwitja-rr-yi-n *dhäwu-wurr-a...*
ENDO.PERL-**III**-ANA-SEQ story-PERL-SEQ

'They spoke to us, those that bore us and we grew up through those stories...'
Wilkinson (2012:369-70)

b. *ŋunha* *dhuḏupuŋur* *ŋunhi* *mayaŋ* ***marrtji*** *ŋorra* *nyumukuṉiny*
DIST PLACE ENDO throat **go.I** lie.**I** little

'There at Dhuḏupuŋur, there lies a small creek' Wilkinson (2012:370)

Along with *marrtji*, other positional verbs including *ŋorra* 'lie', *nhina* 'sit', *dhärra* 'stand', *gorrum* 'be.high' find similar usage, collocated with other verbs ostensibly in the same clause; Wilkinson (2012:370) analyses these as having a coordinative-type semantics. In fact, there are examples of these occurring in an apparantly aspectual-auxiliary usage (e.g. 173)

heck for 2nd pos henomenon, replace *limurr* ith *bukmak* or *yolŋu'yulŋu* nd see what happens to *ga*

(173) *Limurr* ***nhi-na*** *ga* *buḻ'yu-n* *rrambaŋi* *ga* *guŋga'yun-mirr*
1p.INCL **sit-I** IPFV.**I** play-**I** RECIP and help–PROP

'We need to play together and help each other.' (Campbell 2011:14)

4.4.2 Perfectivity

m actually pretty confident hat *bili* is NOT an aspect arker. A preliminary nalysis would be that it's aybe modal (vdW ex 99) ut more likely a FORCE arker (which is closer to dW's analysis than W's. seems available in all sorts f contexts (see p127) for he speaker to insist on the elative precision of some perator. I think this ought o get all the uses from OMPLETIVE (vdW p204) to ecause to the temporal and odal uses on vdW dW:51 claims that it eceives stress', 'reinforces

Perfective aspect/s are generally characterised as those which *do not make reference to the internal constituency of a predicated situation* (see also Comrie 1976:§1.1 for more.) While a general 'perfective aspect' is not explicitly marked in Dhuwal(a), there are a number of adverbial devices that appear to encode shades of perfective meaning. Most notably

[8] In fact Wilkinson (2012:367) suggests that when a predicate receives past temporal reference (e.g. in the **I** and **III** inflections), a perfective reading is "assumed" in the absence of *ga/gan*.

is *bili*,[9] glossed by Wilkinson (2012:367), Morphy (1983:145) and Lowe as COMPLETIVE (CPLV), with a meaning normally translatable as 'already' – suggesting that this particle is at least compatible with perfect (PERF) meaning. Conversely, *bili* is described by van der Wal (1992:127) as a variety of modal necessity operator, an interesting generalisation which informs that I present below.

Wilkinson describes CPLV-marked predicates as attending to the 'termination of a situation', indicating that the eventuality described in their prejacent 'has ended' as well as having a discourse-level function, signaling the end of some phase in a text.

(174) **The apparent aspectual contribution of *bili* 'CPLV'**

a. *yo* ***bili*** *linyu* *gumurr-buna-na-mi-na-ny* *buku-l̪urrkun'-mirr*
yes **CPLV** 1d.INCL chest-strike-**IV**-R/R-**III**-PROM face-few-PROP

'Yes, we'd met a few times.'

b. ***bili****-n* *ŋayi* *buna-na-n* *buŋgawa-ny*
CPLV-SEQ 3S arrive-**III**-SEQ boss-PROM

'The boss has already arrived.' (Wilkinson 2012:367)

While *bili* frequently gives rise to these perfective readings discussed here, it is likely that this emerges out of a more general function. In §**??** below, I attempt to characterise and unify intuitions about the range of aspectual and non-aspectual meaning contribution of this particle.

an elicitation (2Aug'18) ession "must be because" as translated with just *bili*. his could be being sloppy ut alternatively could point the fact that any claim of ausality is necessarily nferential on the speaker's art? i.e. *bc* and *must be bc* ould be synonymous nder this analysis.

auxiliary the right naracterisation of these articles?

4.5 Modal particles

ŋuli

ŋuli is described by Wilkinson (2012:347) as a HABITUAL and HYPOTHETICAL particle, capturing its "wide range of functions". Wilkinson claims that *ŋuli* associates with "non-specific" and "non-actual" eventualities (*sc.* "those that recur, are customary...generic" and "hypothetical specific events" (including conditional protases.))[10,11]

Importantly, *ŋuli* is also reported to be incompatible with **III**-inflected clauses. Wilkinson further suggests that this provides *prima facie* evidence of the particles alignment with the IRREALIS category. Habitual readings that hold in the present associate with **I** (e.g. 175a-b), whereas those which are past- and future-tensed receive **IV** and **II** inflections respectively (175c,d). Wilkinson suggests that occasionally "customary practices" are infelcted with *ŋuli*+**II**, although suggests optionality between these forms. This observation

[9] *l̪inygu/l̪iŋgu* seem to be treated as less-frequent synonyms of *bili* by Wilkinson (although glossed as "same" (e.g. 293) and with other translations by other authors. Its function in these expressions will not be contrasted to *bili* in this work.

[10] Formally, Wilkinson (2012:348) notes that in its habitual functions, *ŋuli* frequently is phonologically reduced to *li* (and indeed can fuse with the imperfective marker yielding a form *ga=li*), a process not evidently not available to it in its HYP functions.

[11] Notably, in her treatment of Wangurri, McLellan (1992:156) suggests that '[r]ather than an aspect in Wangurri, the Habitual is an intermediate modality, encompassing both realis and irrealis.' While this claim doesn't cohere with contemporary semantic thinking on these categories in an obvious way, it raises an interesting observation about perceptions of the reality status of habitual-marked predicates and the grammaticalisation of these categories in Yolŋu Matha. This is discussed in further detail below.

is consistent with the observation in §4.1 above that **II** associates with imperative force and associated root modalities.

(175) **Habitual readings of *ŋuli* across three inflectional categories**

a. ***ŋuli*** *cooccurring with **I** for present habitual reading*

ŋarra ***ŋuli*** *ga rur'yun munhawumirri yan jan bili*
1S **HAB** IPFV.**I** get.up.**I** early morning EMPH thusly.**I** CPLV

'I always get up early in the morning.' (Wilkinson 2012:348)

b. ***ŋuli*** *cooccurring with **I** for kind-level predication*

... mapu-ŋur rumbal-nha djanda ***ŋuli*** *dhawaṯthu-n*
egg-ABL body-SEQ goanna **HAB** exit-**I**

'...goanna (bodies) come out of the eggs.' (Wilkinson 2012:349)

c. ***ŋuli*** *cooccurring with **IV** for past habitual reading*

yurr ŋanapurr ŋuli ga-nha ŋunhi djäma-ny ŋuriŋi-wurru-y
and 1p.EXCL HAB IPFV.**IV** ENDO work-PROM ENDO.ERG-PL-ERG
miyalk-kurru-y, buku-djuḻkmara-nha-mi-nya
woman-PL-ERG face-pass-**IV**-R/R-**IV**

'We, those women, were working, swapping with each other.'
(Wilkinson 2012:350)

d. ***ŋuli*** *cooccurring with **II** for future habitual reading*

nhä-mirr balaŋ ŋayi gi ŋirrimbu-ŋ ŋarra-kal milmitjpa-ny, ga
what-PROP IRR 3S IPFV.**II** come-**II** 1S-OBL afternoon-PROM and
goḏarr'-tja ŋayi ***ŋuli*** *gi dhiyal warkthu-rr*
morning-PROM 3S **HAB** IPFV.**II** PROX.LOC work.**II**

'Hows about she come to me in the afternoon(s) and work here in the morning(s)?' (Wilkinson 2012:351)

What Wilkinson (2012) refers to as the HYPOTHETICAL use of *ŋuli* is used to mark a conditional protasis (antecedent clause), where it alternates (ostensibly freely) with *ŋunhi* 'ENDO' (further discussed in §4.7, see also Wilkinson 2012:667.) She claims that it occurs with **I** for NONPAST antecendents (also sometimes with **II** in unclear environments) and with **IV** for past-tensed antecedents (351, see exx. 176a-b).

(176) ***ŋuli*** **as the marker for the antecedent of a conditional**

a. ***ŋuli*** *nhe dhu warku'yu-n wuŋgan-nha, ŋayi dhu läwu-m*
HYP 2S FUT annoy-**I** dog-ACC 3S FUT bite-**I**

'If you tease the dog, it'll bite.' (Wilkinson 2012:351)

Worth getting negative judgment with **III** for completeness?

c) actually isn't an unambiguous past habitual as translated, may be worth trying to find a clearer example elsewhere.

The distinction between ***ŋuli*** with **I** v. w̄ **II** is a possible research questino. It's likely that whatever semantics I model for these inflections just won't clash with *ŋuli* and that they'll just do something similar. Maybe restrictions on the ordering source?
This said a prediction is that if you have some sort of root force on the antecedent then it ought to naturally emerge. Think of tests.

b. *ŋäthil ŋarra* ***ŋuli*** *balaŋ ḻiya-ŋamaŋamayun-mi-nya bala ŋarra balaŋ*
earlier 1sg **HYP** IRR head-make-R/R-**IV** then 1S IRR
waŋa-nha-n
speak-**IV**-SEQ

'Had I thought of it before, I would have spoken.' (Wilkinson 2012:352)

This subsection has described the two major uses of *ŋuli* as it appears in the verbal complex. Wilkinson (2012:353) also provides the following example (177) where this particle occurs twice, ostensibly each instance providing exactly one of these readings.

(177) ***ŋuli* doubly occurring as a habitual marker (HAB) and a conditional modal (HYP)**

ga ***ŋuli*** *balaŋ* ***ŋuli*** *nhä-nha wäyin waŋgany'-thu yolŋu-y, bala*
and **HYP** IRR **HAB** see-**IV** animal one-ERG person-ERG then
marrtji-nya wap-wapthu-na
go-**IV** REDUP~hop-**IV**

'And if a person sees an animal, then (he) creeps up...' (Wilkinson 2012:353)

el's FT seems a little bit off ere, otherwise the **IV** is resumably unexpected? **erify** his is a great example for n underspecification-based nalysis. ote also the distribution of *uli* readings: can HYP ever ccur in simple sentences?

ŋula

Wilkinson (2012:710) provides a brief discussion of function of 'problematic particle' *ŋula* (her INDEF2). As with *ŋuli*, described above, there is evidence that this particle is related to the distal demonstrative stem. It occurs with various pronouns to generate indefinite meanings and in irrealis contexts (sometimes in conjunction with other modal particles), ostensibly to generate a type of downtowned possibility reading.

el compares *ŋula, balaŋ, ula balaŋ, mak*. It'd be good see to what degree her araphrases are shared dgments. first blush looks ke ŋula is some kind of circ. ossibility

(178) *yaka warku'yu-rr wuŋgan-nha, ŋayi* ***ŋula*** *ḏarrkthu-rr nhuna*
NEG tease-**II** dog-SEQ 3S INDEF bite-**II** 2S.ACC

'Don't tease the dog, it might bite you' (warning) (Wilkinson 2012:710)

balaŋ(u)

balaŋ is glossed by (Wilkinson 2012:353) as an 'irrealis' (IRR marker, 'since it codes situations which have not (yet) occurred.' This is consonant with Lowe's treatment of the expression of 'MIGHT/SHOULD/WOULD/MUST' in Gupapuyŋu (her L.63). Lowe notes that "[c]ontext and intonation...usually indicate whether 'should have' or 'would have' is meant", suggesting that *balaŋu* (and *ŋuli*) are underspecified for modal force. As described for *ŋuli* above, *balaŋ(u)* appears to be unattested in clauses with **III** inflection. Possible future eventualities are coded with *balaŋ(u)*+**II** (or sometimes **I**, especially if co-occurring with *dhu*) whereas past possibility readings are coded with *balaŋ(u)*+**IV** (as in 179).

(179) **Counterfactual readings with *balaŋ(u)+IV***

a. ***Balaŋu*** *walala ḏiltji-lili marrtji-nya(ra)*
IRR 3p bush-ALL go-**IV**

'They should have gone to the bush' (Lowe §63)

b. CONTEXT. Speaker had a toothache

barpuru ***balaŋ*** *ŋarra bala dentist-kal marrtji-nya dhiyak*
yesterday **IRR** 1s MVTAWY dentist-OBL go-**IV** PROX.DAT
filling-gu
filling-DAT

'Yesterday I should have gone to the dentist for a filling.'
(Wilkinson 2012:353)

c. *ga bulu-ny maṇḏa ŋunhi* ***balaŋ*** *roŋiyi-nya bala-yi räku-nha-lil;*
and again-PROM 3d ENDO IRR return-**IV** MVTAWY-ANA fish-**IV**-ALL
yän ŋayi walu warray nyumukuṉiny'-thi-I, bala ŋanapurr yän
EMPH 3S sun DP little-INCH-**I** then 1p.EXCL EMPH
marrtji-n räli, roŋiyi-rr-a wäŋa-lil-a
go.**I**-SEQ MVTTWD return-**I**-SEQ place-ALL-SEQ

'...and they might have gone back off fishing again; but the time was getting short, so we came back home.' (Wilkinson 2012:354)

d. *walal* ***balaŋ*** *djuḻk'mara-nha wakal-nydja, (yurru bäyŋu-n)*
3p **IRR** win-**IV** game-PROM (but NEGQ-PROM)

'They could have won the game(, but didn't)' [FW? 20180802]

o re-elicit with richer ontext (to verify cfact eading)

There are a number of observations to make on the basis of the data in (179). Note that in (b,c), **IV** is used in to make predications of past possibilities where **I** would be used in corresponding (NON-TODAY PAST) realis assertions. In effect, this indicates that the metricality and cyclicity encoded in the inflectional paradigm (described in §4.1 above) is neutralised in the presence of *balaŋ(u)* (*cf.* the discussion of negation in §4.2 above, where these distinctions were preserved in the correspondences between **I~II** and **III~IV**.)

In (179d), only a non-effected, counterfactual reading is available. Unlike its English translation, *balaŋ* appears to be infelicitous in a past epistemic context (cf. 182a below.) This observation is further considered below in Chapter 5.

lel makes an errant bservation of **balaŋ+IV** eceiving a possible ONPAST interpretation, see 355, her ex. 245. It may be orth getting judgments of he felicity of this in the field.

his claim needs to be erified with further data. ssuming its relevant and ctuall *is* taken up again in hapter 5... e. show that oneffectedness is truth onditional (← that this is navailable with a pst epist eading)

(180) **Modalised claims with *balaŋ(u)*+II**

a. *ŋayi* ***balaŋ*** *limurruŋ maḏakarritj-thi*
3s **IRR** 1d.INCL-DAT angry-INCH.**II**

'she may be angry with us (today)' (Wilkinson 2012:354)

mak(u)

Mak(u) is treated as an modal adverbial. It is associated with an epistemic modal flavour an appears to be very underspecified for force, translatable as 'may/might/could' as well as 'must' *etc.* in their epistemic uses. Wilkinson (2012:688) notes that, unlike the modal par-

While Mel's observation is ost likely going to come ut correct, it would be good o double check the felicity f occurrences of *mak* taking gh scope over **III** clauses ven how good a finding nfelicity would be in these

ticles discussed above, *mak* 'is not confined to any particular TMA combinations' and can take scope over 'a single nominal or a clause.' Additionally, *mak* (with an optional indefinite pronoun/wh-word) can be used pragmatically to concatenate disjunctive possibilities (692-3).[12] An example of this use is given in (181c)

(181) a. CONTEXT. Speaker is asking his son where his daughter is.

— *Way! Wanha nhuŋu yapa?*
Hey where 2s.DAT sister

— ***Mak*** *momu bala'?*
maybe FAMO house

— *Yaka bäyŋu,* ***mak*** *school-ŋur!* Doing that homework*!*
NEG NEGQ **maybe** school-LOC

'Hey! Where's your sister? — Maybe at grandma's? — Ah no, she must be at the school: doing her homework.' [AW 20180730]

b. ***mak*** *ŋarra dhu bawala-mirri-y* *bäyŋu-thi*
maybe 1s FUT random-PROP-ERG NEGQ-INCH.**II**

'I might die at any time.' (Wilkinson 2012:437)

c. *wiriny'tju+n+a nhe dhu ŋaraka+y ŋula nhaliy* *minaŋara+y* ***mak***
scratch-**I**-SEQ 2s FUT bone-ERG something-ERG shellfish-ERG maybe
ŋäṉ'ka+y, ***mak*** *buthuru-wuŋgan+dhu, mak* *garrwili+y,*
shellfish-ERG maybe ear-dog-ERG maybe shellfish-ERG
nhä mak *yiki+y*
what maybe knife-ERG

'You'll scrape it with the some shell: either *minaraŋa* or *ŋäṉ'ka* or *buthuru-wuŋgan* or *garrwili* or a knife.' (Wilkinson 2012:693)

(182) a. Past-epistemic reading available with *mak* (cf. 179d)

8.30 dhuwan-dja, ***mak*** *wal win-na game-nydja*
8.30 PROX-PROM **maybe** 3p win-**?** game-PROM

'(It's 8.30), they may have won the game (by now)' [F 20180802]

b. *ŋula* ***maku*** *nhä dhu maṉḏa batha-na*
MOD **maybe** what FUT 3d cook-**IV**

'Maybe they wanted to cook something.'

Wilkinson (2012:688-9) also notes an additional (pragmatic) function where *mak* is used with a declarative statement to form a polite request (a feature it shares with the (perhaps more deferrent) *balaŋ(u).*' An example of this use is given in (183).

[12]Wilkinson (2012:692) points out that this polysemy is reported in a number of Australian languages (including Diyari and Dyirbal.) This is perhaps expected given the modal contribution of disjunction Roberts (*e.g.* 1989). In effect, English permits a similar construction: *'Maybe I'll go, maybe I won't...'*

What would the effect of changing *mak* to *bili* be here? (in cases that look like epist. nec.?) See vdW p.127. It may be that the interaction between *bili* and the inflections is worth talking about earlier

ing ex. is this to worry about?

needs to be re-elicited with native djr verb form (for the purposes of getting a clear inflectional cat. ~~and a second example also~~.

granted i still don't really know what *ŋula* is: is this okay/synonymous without *ŋula*?Her translation seems off.

(183) *Way, ŋali* ***mak*** *bilmara-m ŋini*
hey 1d.INCL **maybe** turn-**I** eh

'Hey, let's change (what we're doing) shall we?' (Wilkinson 2012:689)

yanbi

n the basis of tokens of *anbi* in the bible this might ot be sufficient qua account f the possible uses of *yanbi*. may be that it's just a kind f discourse particle that is ntonymous to *warray* or oemthing like that?

Wilkinson (2012:686) glossed the particle *yanbi* as a COUNTERFACTUAL. It appears to indicate that, despite appearances or the potential belief state of the addressee, its prejacent *does not hold in the real world.* Wilkinson reports that the prejacent to *yanbi* always receives **II** or **IV** inflection; this result is expected in view of the fact that the prejacent is obligatorily IRREALIS aligned. An example is given in (184).

his result (irrealis ignment) actually isn't early holding for the Ramo arieties

(184) *ga ŋanapurr+nydja ŋuli birrka'yu+n* ***[yanbi*** *ŋuli märr galki, wäŋa yan*
and 1p.EXCL-PROM HAB think-**I** **CFACT** HAB so close place EMPH
barrku warray]
far DP

'We thought incorrectly that it was quite close, where in fact the place was far away.'
(Wilkinson 2012:686)

aybe TFAs should actually e a subsection underneath he demonstrative ystem"....?? dditionally while it's robably important to ention TFAs here as ery're part of the means r temporal expression etc, 's also a v fine line between ere and the analytic part ost likeyl

4.6 Adverbial temporal expression

As discussed in Chapter 0.1, cross-linguistically, temporal reference is established by reference to a number of mechanisms, of which grammaticalised items (*viz.* tense marking) is only one (see Tonhauser 2015, Klein 2009 a.o.). Temporal adverbials in particular are lexical devices which 'constitute an extremely rich and varied class of expressions...allow[ing] the speaker to encode more subtle shades of temporality than [grammatical] tense and aspect' (Klein 1994:158). In a typological survey of devices that Australian languages make use of for temporal expression, Austin claims:

> In all Australian languages there is a single term for the temporal deictic centre, however its reference is always imprecise and it shows great polysemy depending on the contrastive context (ranging over 'now, today, nowadays (in contrast to the past')).
>
> (1998:147)

In this subsection, I outline the lexical resources used for encoding temporal meaning, which as we will see below (Ch. 5) intersect in a number of revealing ways with the quirky Dhuwal-Dhuwala inflectional paradigm described above. Dhuwal-Dhuwala makes use of an inventory of temporal adverbials, and additionally inflect nominal elements (including demonstratives) with ERG (Wilkinson's ERGATIVE-INSTRUMENTAL-TEMPORAL case, see 2012:131,157*ff*).[13] §4.6.1 discusses the important contribution of the demonstrative system to temporal (and other forms of deixis), §4.6.2 describes temporal frame adverbials proper.

[13]This polysemy, where a single caase suffix marks transitive subjects, instrumental NPs and temporal/spatial location or duration is attested elsewhere in Pama-Nyungan as well, e.g. Breen (1974:§2.3.3) for the Wakaya [wga] OPERATIVE.

4.6.1 The demonstrative system

As with other Yolŋu languages, Dhuwal and Dhuwala varieties have a rich demonstrative pattern. As shown in Table 4.5, four relational classes are distinguished and these are each inflected across all nominal cases.

$\mathcal{R}$	ABS	ERG	DAT	LOC	ABL
PROX	*dhuwal(a)*	*dhiyaŋ(u)*	*dhiyak(u)*	*dhiyal(a)*	*dhipuŋur(u)*[14]
MED	*dhuwali*	*dhiyaŋi*	*dhiyaki*	*dhiyali*	
DIST	*ŋunha*	*ŋuruŋ(u)*	*ŋuruk(u)*	*ŋunhal(a)*	*ŋunhaŋur(u)*
ENDO	*ŋunhi*	*ŋuriŋi*	*ŋuriki*	*ŋunhili*	*ŋuliŋuru*
INDEF *be-*				*beŋumi*	*beŋur(u)*

Table 4.5. A partial tabulation of the demonstrative paradigm in Dhuwal-Dhuwala (see also discussion at Wilkinson (2012:255*ff*) and van der Wal (1992:170*ff*))

e- 'INDEF'-stem may bear nclusion in the table as ell? (see Wilk p280ff)

o i want/need to give xamples of this to emonstrate the distance arameter in spatial deixis?

Familiar categories PROXIMAL, MEDIAL and DISTAL reflect the (subjective, contextually determined) *distance* of a given locus from the Speaker. This spatial deictic function can appear to modify a noun being indicated or can equally appear bare, indicating either a spatial location or some individual at that location. Consequently `djr` *dhuwal(a)* (PROX) translates into English as 'this' or 'here' where *dhuwali/ŋunha* (MED/DIST) translates as 'that' or 'there.' The example in (185) shows a number of these uses.

(185) **Use of demonstratives to differentially indicate spatial location of places and objects**

CONTEXT. The bed is out of sight, while the chair is in sight of both Speaker and Addressee

ŋunha	*ŋayi*	*ŋorra-nha-mirr,*	***ŋunha***	*ga*	*girri-y'*	***ŋuruŋ***	*dhurrpara-m;*
DIST	3S	lie-**IV**-PROP	**DIST**	IPFV.**I**	thing-ERG	DIST.ERG	cover-**I**

dhuwal	*ga*	*girri-y'*	***dhiya*-ŋ**	*nhina-nha-mirri-ny*	*dhurrpara-m*
PROX	IPFV.**I**	thing-ERG	**PROX**-ERG	sit-**IV**-PROP-PROM	cover-**I**

'There's a bed, that's covered by those clothes; here the chair is covered by these clothes.' (Wilkinson 2012:254)

ote: I don't intend on eeping this terminology, it oesn't seem like the best haracterisation

ŋunhi, Wilkinson's TEXTUAL DEICTIC, on the other hand, participates in a number of related discourse cohesion constructions (Wilkinson 2012:254, the terminology originally due to Lyons 1977:667)[15]. She describes its uses for tracking reference to specific individuals,[16] as a subordinator (along with *ŋuli*), and also for referring to nonpresent temporal situations. For current purposes, we are particularly interested in this latter use which will be

[14] According to Wilkinson (2012:223), the Djambarrpuyŋu paradigm is deficient insofar the distinction between proximate subcategories (PROX and MED) is neutralised in the ABL and some other oblique categories. See also van der Wal (1992:170, note 12) for further discussion.

[15] In his general series on semantics, Lyons (1977:667*ff*) describes the range of phenomena that might be classified as 'deixis.' For him, *textual deixis* is the use of a linguistic expression 'to refer to linguistic entities of various kinds.' He contrasts this explicitly with anaphora, given that these expressions are 'not coreferent with any antecedent expression.' Wilkinson (2012:266) provides examples of ENDO (and PROX) performing these functions, although certainly neither stem is restricted to just 'TEXTUAL DEICTIC' function.

[16] Van der Wal (1992:175*ff*) takes a somewhat different (although likely compatible) tack on the meaning of *ŋunhi*, which she appears to claim has a predominantly information structural (and discourse-cohesive) function, reactivating the salience of some individual referred to earlier in a discourse. Van der Wal glosses both *ŋunha* and *ŋunhi* as RELATIVE DEICTICS.

investigated below.[17] While 'textual deixis' is indeed an important function played by this stem, it is perhaps more appropriately described as an *ENDOPHORIC* demonstrative following the terminology proposed by Halliday and Hasan (1976). This term (contrasted against EXOPHORIC demonstrative uses, which refer 'to entities in the surrounding [discourse] situation') comprises "anaphoric" and "recognitional" in addition to "discourse deictic" functions (Diessel 1999:6*ff*). Understanding *ŋunhi* as a general endophoric demonstrative is enlightening in view of relativising, temporal and modal functions (where it appears to have assumed the role of a "general subordinator' (i.e. Wilkinson 2012:656, see §4.7)).

4.6.1.1 Temporal uses of demonstratives

Wilkinson (2012:255*ff*) notes a 'two-way-distinction coded by demonstratives over the time dimension.' Inflected forms of the PROX and ENDO participate in this distinction. As with other nominals, these demonstratives frequently occur with ergative inflection, used in its temporal function ('TEMP', as discussed in Wilkinson 2012:131) and in phrasal expressions (*sc.* collocated with *bala* (MVTAWY) and *bili* (CPLV), Wilkinson 2012:289*ff*). Here I discuss the participation of these lexical items in the encoding of temporal deixis – their uses are summarised in table 4.6 below.

Participation of PROX in temporal frame expressions The Dhuwal-Dhuwala expression *dhiyaŋ(u) bala* picks out the "temporal deictic centre" described by Austin (1998) (*i.e.* utterance time; this expression is translated as 'now' in all grammars).[18] Notably, it is composed of *dhiyaŋ(u)* the ERG-inflected proximal demonstrative and *bala*, a frequently-occurring particle that, in isolation, is normally translated as either 'then', functioning to advance the reference time in a discourse, or a adverbial denoting 'movement away' (MVTAWY) from speaker. Three examples of *dhiyaŋ bala* 'now' are provided in (186). These three sentences show the compatibility of *dhiyaŋ bala* with both present and non-present temporal reference; demonstrating that this expression must be capable of 'picking out' a temporal interval that is broader than actual *time of speech*.[19]

et judgments and
acktranslations for this esp
view of the lex semantics
nhäma as discussed in the
ection on **III**

(186) ***dhiyaŋ(u) bala* 'now' occurring with with diverse temporal interpretations**

a. TODAY PAST with **III**

dhiyaŋ	***bala***	*napurr*	*bäpi*	*nhä-ŋal*	*gäthur*
PROX.ERG	**MVTAWY**	1p.EXCL	snake	see-**III**	today

'We saw a snake today' (Wilkinson 2012:256)

[17] For more detail on the apparent range of semantic oppositions encoded in the demonstrative paradigm, the reader is referred to Wilkinson 2012:288. The semantics of each 'stem' will also be further explicated in Chapter 5.

[18] Note that, given that their reference is established automatically by the context of utterance, expressions including 'now, here' etc., both of which are translatable into Yolŋu Matha using PROX, are, for some authors NON-DEMONSTRATIVE indexical expressions (e.g. Perry 2012:3). In view of the fact that there are clear examples of PROX relying on speaker demonstration/intention, I refer to them as demonstratives throughout. This issues is further investigated in Chapter 5 below. This observation has clear implications for our theory of indexical/context-dependent linguistic expression.

[19] Austin (1998:147) suggests that this class of lexical expressions (*viz.* "point time words") receiving "interval reference rather than strict point or punctual specification" is a feature of all Australian languages.

b. PRESENT reference with **I** (EVENT-IN-PROGRESS reading)

dhiyaŋ ***bala*** *ŋali* *ga* *waŋ-a*
PROX.ERG **MVTAWY** 1d.INCL IPFV.**I** speak-**I**

'We're speaking now' [AW 20180730]

c. PRESENT reference with **I** (CHARACTERISING reading)

ga ***dhiyaŋu****-ny* ***bala*** *ŋunhi-yi* *ŋanpurr-nha* *ga* *bäki*
and **PROX.ERG**-PROM **MVTAWY** ENDO-ANA 1p.EXCL-SEQ IPFV.**I** use
gäthur-nydja
today-PROM

'And now we are using that (law) today (*i.e.* these days)'
(Wilkinson 2012:256)

d. TODAY FUTURE reference with *dhu*+**I**

dhiyaŋ ***bala*** *walal* *dhu* *buna,* *yalala*
PROX.ERG **MVTAWY** 3p FUT arrive.**I** later

'They're coming later today.' (155b, rep'd, Wilkinson 2012:256)

dhiyaŋ(u), the ERG-inflected PROX demonstrative, also composes with ***bili*** (identical in form to the 'CPLV' particle, aspectual function of which is outlined in §4.4.2 above.) According to Wilkinson (2012:295), *dhiyaŋ bili* can be glossed 'just now' or 'a little while ago' – picking out a narrower interval than *dhiyaŋ(u) bala*, usually immediately preceding speech time (although topic times other than utterance are also reported as available, shown in e.g. (187, *note that Wilkinson marks her translation in (d) as tentative*.) These examples are further discussed below.

(187) **Uses of *dhiyaŋ(u) bili* 'just now'**

a. TODAY PAST (immediate) with **III** (compare 186a)

dhiyali *napurr* *dhiyaŋ* *bili* *nhä-ŋal*
MED.LOC 1o.EXCL PROX.ERG CPLV see-**III**

'We just saw a snake there.' (Wilkinson 2012:295)

b. TODAY PAST with **III**

Ŋunha *ŋarraku* ***dhiyaŋ*** ***bili*** *wirrkuḻ* *gäthu'mirriŋu* *dhiŋgaŋal*
DIST 1s.DAT PROX.ERG CPLV young.girl child.SM-PROP die-**III**

'My daughter has just died.' [DB Mathuyu 9:18]

c. TODAY PAST and (potential) futurate usage of *dhiyaŋ bili* with **III** and **I**

dhuwa-ndja *dhiyaŋ* *bili* *ḏo'yu-rr* *ŋayi,* *ŋunha-n* *bala* *dhiyaŋ*
PROX-PROM PROX-ERG CPLV arrive-**III** 3s DIST-SEQ MVTAWY PROX.ERG
bili *marrtji* *ga*
CPLV go.**I** IPFV.**I**

'He just arrived here, he's going over there now.' (Wilkinson 2012:295)

re futur(at)e readings vailable?
Would bear checking backtranslation, eliciting ew examples...) I can just el the analytic problems his is gonna pose (I'm retty sure I would have xpected *ŋuriŋi bili* here.) ither way there's probably translation that preserves he original's info structure ore faithfully.

o the grammarians all say hat same-day reference is ecessary, and an apparent mit on the otherwise ubjectivity of the interval cked out by *dhiyaŋ bili* nd **III**!). I wonder if this is eally true in view of the ng's desire to refer to the ecency of his daughter's eath.

neck this out with peakers, for a coherent heory of this i suspect *hiyaŋ bili* in an anaphoric se like this is probably a ylistic narrative technique nd right at this time, the ater went down"...

d. Anaphoric interpretation of *dhiyaŋ bili*

baḏak napurr galku-n ga ŋayi-ny gapu-ny marrtji ***dhiyaŋ bili***
still 1p.EXCL wait-**I** and 3s-PROM water-PROM go.**I** **PROX.ERG CPLV**
nyimdhu-n
go.down-**I**

'We kept waiting as the (flood)water went down.' (Wilkinson 2012:295)

The co-occurrence of *dhiyaŋ bili* and the **III** inflection in (187a-b) is notable in considering the meaning contribution of *bili*. Given that *bili* has, in earlier work, been analysed as a COMPLETIVE aspect marker and given its participation in this indexical expression. The use of *dhiyaŋ bili* is used here to establish a type of PERFECT meaning, emphasising the temporal immediacy (i.e. recency) of the snake-sighting event in (a) (as compared to the minimal pair with *dhiyaŋ bala* above) or death event in (b).

The (subjective) immediacy of both predicates in (187c) seems to license both uses of *dhiyaŋ bili*. Of course, the event time of these cannot be identical; the temporal interpretation of the subject's arrival- and departure- events is a function of the verbal inflection and the lexical aspect (*Aktionsart*) of each predicate, in both cases constrained by *dhiyaŋ bili*.

his is an elicitation topic.

In (187d), note that *dhiyaŋ bili* appears to pick out a reference time that is contemporaneous with the past-shifted topic time of the first clause (whereas it is unclear whether the **I** inflection on *nyimdhun* 'go.down.**I** is functioning as a recent past marker or a present marker, anaphoric on a topic time established by the preceding clause.)

Participation of ENDO in temporal frame expressions In contrast to the *dhiyaŋ(u)* (PROX) series of temporal demonstratives phrases, *ŋuriŋi* (ENDO) appears to be compatible with **NON-**PRESENT temporal frames. The interpretation of this expression, therefore is completely reliant on elements of the linguistic or non-linguistic context. As with *dhiyaŋ(u)*, the ergative inflected ENDO—*ŋuriŋi*—is found collocated with *bala* (MVTAWY). Examples of these uses in both past and future contexts are provided in (188).

same day future out? In ct negative judgments for odiernal and/or present eadings would be great

(188) **Temporal interpretations of *ŋuriŋi bala* 'at that (non-present) time'**

a. Compatibility of RECENT PAST **I** with *ŋuriŋi bala*

ga (yawungu) ***ŋuriŋi-ny*** ***bala*** *ga dhuwal ḏumurru'-ŋu-y,*
and (yesterday) **ENDO.ERG**-PROM MVTAWY IPFV.**I** PROX big-*ŋu*-ERG

bäyŋu-n yolŋu walal wukirri waŋara-n ga dhärra
NEGQ-SEQ people 3p school empty-SEQ IPFV.**I** stand.**I**

'Last week there was nobody at school.' (Wilkinson 2012:256)

b. Compatibility of FUTURE **II** with *ŋuriŋi bala*

ga ***ŋuriŋi-n*** ***bala*** *dhu boŋguŋ, bäyŋu-n goḻ,*
and **ENDO.ERG**-SEQ MVTAWY FUT tomorrow NEGQ-SEQ school

waŋara-n dhu gi dhärri
empty-SEQ FUT IPFV.**II** stand.**II**

'And next (week), there'll be nobody at school, it'll be empty.'
(Wilkinson 2012:256)

eed to know if this is ompatible with SAME DAY eadings or just a remote ast one.

c. (!!) Compatibility of REMOTE?? PAST **III** with *ŋuriŋi bala*

dharrwa muka walal gan ḏäpthurr-nydja yurr waŋgany yolŋu
many DP 3p IPFV.**III** sit.together.**III**-PROM but one-PROM person
marrtji-na-ny ***ŋuriŋi bala*** *munhawu*
go-**III**-PROM **ENDO.ERG** **MVTAWY** night

'Many were sitting around, but only a single person went at that time, at night-time.' (Rudder 1983:57)

These examples (188) show the compatibility of *ŋuriŋi bala* across inflectional categories. Notable (TO CHECK!) is – in the presence of *ŋuriŋi bala* – the unavailability of present interpretations with **I** and TODAY FUTURE/PAST interpretations with **III**.

aybe a scalar/ onventionalised nplicature or MAXPRESUPP rt of account is what we'll nd up wanting for this.

Also parallel to its PROX counterpart, *ŋuriŋi bili* picks out a NON-PRESENT interval and emphasises the contemporaneity of that interval and the eventuality described by the predicate, such that an adequate translation may be 'right then.' Examples of this phrase in usage with both past and future interpretations are given in (189) below.

(189) **Uses of *ŋuriŋi bili* 'right then'**

a. Compatibility of FUTURE interpretation with *ŋuriŋi bili*

Yurr maṉḏa dhu marrtji ŋunhi dhäwuny' *lakara-m* ***ŋuriŋi***
but 3d FUT go.**I|II** ENDO story-PROM (or acc?) tell.**I** **ENDO.ERG**
bili *walu-y-nydja, l̪urrkun'-thu dhuŋgarra-y-nydja ga bulu 6-thu*
CPLV sun-ERG-PROM three-ERG year-ERG-PROM and ADD 6-ERG
ŋal̪indi-y-nydja.
moon-ERG-PROM

'And meanwhile, they (two) will go around preaching for three years and six months.' (DB Ribalaytjin 11.3)

hat is this even? it looks ke the Vb⁰ is being elativised. This may not be he best example given how range the syntax is, so the T of *ŋuriŋi bili* isn't super ear (is it *marrtji*?)

b. Compatibility of PAST **III** with *ŋuriŋi bala*

Ga dhunupa-n ŋayi ŋunhi miyalk-tja ḏukthu-rra ***ŋuriŋi*** ***bili***
And correct-SEQ? 3s ENDO woman-PROM heal-**III** **ENDO.ERG** **CPLV**
yan walu-y-nydja
only sun-ERG-PROM

'And just like that, the woman was instantly healed.' (DB Methuyu 9:22)

ote also that the matrix erb is probably **II** inflected hereas the embedded one **I** while it ought to be nderstood as simultaneous.

In (189a), *ŋuriŋi bili* appears to emphasise the contemporaneity of the two witnesses' story-telling and wandering. Both of these events are taken to be future-oriented with respect to speech-time in this portion of dialogue. In (b), the woman's healing event is intended to be understood as being instantaneous, and occuring at the exact (narrative past) moment that Jesus speaks to her (note that the expression *yan walaluyndja* 'just at that time' likely serves to emphasise the instantaneousness of these two simultaneous eventualities.)

		bala	*bili*
dhiyaŋ(u)	'PROX'	'at this time'	'right at this time'
ŋuriŋi	'ENDO'	'at that time'	'right at that time'

Table 4.6. Summary of deictic temporal frame expressions in Dhuwal-Dhuwala

4.6.1.2 Other (non-frame) uses of temporal demonstratives

ay/probably will promote
a §4.7.3

In addition to the ERG-inflected, temporal frame uses of the PROX and ENDO demonstratives, Wilkinson (2012:255) notes other temporal uses for unmarked (ABS?), ABL- and DAT-inflected forms of both of these stems, in addition to a third stem *be-*, glossed as INDEF.

The sentences in (190) below show the use of the ABL in referring to start times of particular eventualities (this spatio-temporal parallel is grammaticalised in the ablative markings of many languages cross-linguistically.)[20,21] Wilkinson (2012:257) notes that the metaphorical usage of *dhurrawarŋur(u)/dhäɳur(u) ŋuliŋur(u)* 'mouth/door.ABL ENDO.ABL' can be used to translate 'after(wards).' An example of this usage is given in (190b)

(190) **ABL-inflected temporal deixis**

a. ***dhipuŋur****-nydja* *dhuŋgarra-ŋur* *ŋarra-ny* *dhu* *marrtji* *ga* *djäma*
PROX.ABL-PROM year-LOC|ABL 1S-PROM FUT go.**I** IPFV.**I** work.**I**
Gäwa
PLACENAME

'After this year, I will go work at *Gäwa*.' (Wilkinson 2012:257)

b. *dhurrwara-ŋur* ***ŋuliŋur****-yi-ny* *dhawar'yu-na-ŋur-a* *bala*
door-LOC|ABL **ENDO.ABL**-ANA-PROM finish-**IV**-LOC|ABL-SEQ MVTAWY
nhe-ny *dhu* *l̲uka-n*
2S-PROM FUT eat.**I**-SEQ

'After that's finished, then you'll eat.' (Wilkinson 2012:257)

[20]Note also the same (ab)temporal usage of the DIST demonstrative in (191a). The status of any semantic opposition between the DIST and ENDO stems in these temporal uses is not reported and unknown (and indeed they are both used apparently indicating the same interval in this example.)

[21]*E.g.*, Hopi [h̲op] which makes use of this apparent spatiotemporal metaphor in demonstratives also. Its four demonstrative stems are all attested with both spatial reference (apparently basic) and temporal reference (see Malotki 1983:§1.2). An example of Hopi temporal deictics receiving motion (ablative) marking is given below (i).

(i) ***yang-qw*** *itàa-totokya-y* ***a-qw*** *qa* *wuuya-**vo*** *pee-ti*
PROX-ABL 1p-*totokya*-ACC **MED-ALL** NEG large-**ALL** some-REA

'There is not much time left from now 'til our Totokya [the day before the dance].'
(Malotki 1983:27)

c. ***beŋur*** ***bili*** *goḏarr-ŋur* *ŋunhi* *nhe* *marrtji-n* *bala*
INDEF.ABL CPLV morning-ABL ENDO 2S go-**III** MVTAWY
maranhu-gä-nha-lil
food-carry-**IV**-ALL

'(it rained) from the morning when you went off hunting.'
(Wilkinson 2012:257)

Wilkinson (2012:258) notes the 'unmarked' (*sc.* ABS) form of demonstrative stems, which, in her terms, 'appears tom be confined to a determiner function with S nominals.' These uses, which attribute temporal properties, appear to be capable of contrasting different stages of individuals in subject position.

(191) **Unmarked demonstratives participating in temporal deixis**

a. *ŋula-ŋur* *linygu* *baman'-ŋu-ŋur,* *ŋunhi* *bala* *yolŋu'~yulŋu,* *baman',*
DIST-ABL CPLV long.ago-*ŋu*-ABL **ENDO** **MVTAWY** person-REDUP long.ago
ga *gäthur,* ***dhuwal*** ***bala***
and today **PROX** **MVTAWY**

'from long ago, people of that time, long ago, and today (in) recent times (also kept the Wukuṉḏi law).' (Wilkinson 2012:258)

b. *ŋunhi* *nhe* *ŋäthil* *ŋorra* *ga* *dhuwal* *nhe* *gäthur* *ŋorra-n* *yawungu*
ENDO 2S before lie.**I** and PROX today lie.**I**-SEQ yesterday

'You slept before and you slept now this time.' (Wilkinson 2012:258)
(lit. 'that-you slept and nowadays this-you slept.')

Finally, an example of a DAT-inflected demonstrative/temporal adverbial is given in (192). Here *dhiyak bala dhuŋgarraw* – a calendrical nominal collocated with a proximal demonstrative – picks out the calendar year that is contemporaneous with the speech time, attributed to the subject.

(192) **DAT-inflected temporal deixis**

dhuwa-ndja *dhäwu-mirr* *djorra,* ***dhiyak*** ***bala*** *dhuŋgarra-w*
PROX-PROM story-PROP paper **PROX.DAT** **MVTAWY** year-DAT

'This is a newspaper for this year.' (Wilkinson 2012:257)

4.6.2 Temporal frame adverbials

his intro-y part may x-ref
e literature chapter or be
enerally unnecessary.

The complementary notions of 'cyclicity' and 'linearity' permeate the human experience of time – experiences that consist in recurring cycles (e.g. the passing of the seasons) and ostensible unidirectionality (e.g. monotonic aging & the human lifecycle). Cross-linguistically, inventories of adverbials allow for establishment of reference to temporal intervals relativised to both speechtime and repeating calendrical events.

Austin (1998:147) claims that 'the reference of temporal lexical items in [all languages surveyed] is rather vague and imprecise, rather than them being used to refer to fixed intervals or points of time.' On the basis of observations in a number of Yolŋu Matha descriptions, this typological generalisation seems to be borne out in these languages. Wilkinson

		I	II	III
ŋäthil(i) baman'	'long ago'	*	*	PST
barpuru	'yesterday'	PST	*	*
gäthur(a)	'today'	PRES/FUT	*	PST
boŋguŋ	'tomorrow'	*	FUT	*

Table 4.7. Licensing conditions and temporal interpretations of inflectional categories co-occurring with temporal frame adverbials

(2012:158) notes the following set of absolute TFAs (those that encode a relation between speech and reference times:

gäthur(a)	today, nowadays
barpuru/yawungu	yesterday, RECENT/NON-TODAY PAST
boŋguŋ/goḏarr[22]	tomorrow, NON-TODAY FUTURE

The fact that *yawungu* 'yesterday' and *boŋguŋ* 'tomorrow' do not pick out day-length intervals (*cf.* their English glosses) is shown clearly in (188a,b), where *yawungu* and *boŋguŋ* appear to establish frames in the recent past and near future respectively. The reference time is further restricted to the previous/subsequent week by the expression *ḏumurru'ŋuy* 'week.ERG'. The consequence of the composition of these adverbials is the establishment of a 'last week' and 'next week' temporal frame by *(yawungu) ḏumurru'ŋuy* and *boŋguŋ (ḏumurru'ŋuy)* respectively (coreferential with *ŋuriŋi bala* 'at that time' in both instances.)

it still sensible to say that he basic meaning of *awungu* and *boŋguŋ* are esterday' and 'tomorrow' ather than ESTERNAL/CRASTINAL, a eaning like 'yester-' that is nderspecified for temporal istance (yesterweek, esteryear...)?

There similarities between the semantics of these TFAs and the licensing properties of the cyclic tense phenomena described in §4.1 above should be immediately apparent. The consequences of this observation, summarised in table 4.7 and crucial for understanding "cyclic tense" in Yolŋu Matha, are explored in greater detail in Chapter 5 below.

A selection of other frequently-occurring lexical TFAs are provided in Table 4.8 below (see also Wilkinson 2012:158-9 for examples of many of these in use).

ŋäthil(i)	before/prior
yalala	later
baman'	long (ago)
goḏarr	(in the) morning
milmitjpa/ripurru	(in the) afternoon
djeḏa/rangu	(in the) middle of the night
walupuy	(in the) daytime ('sun+ASSOC)
munhawu	(at) nighttime ('night+DAT)

Table 4.8. Selection of TFAs (temporal frames relatived to discourse context)

In addition to these lexicalised temporals (and as suggested at the beginning of this section), one of the functions ERG case marking on nominals is the establishment of a temporal frame for the event described by the predicate. This frame is derived from the semantics of the noun. This usage is shown in (193) below.[23]

[22] *goḏarr* seems to be ambiguous between an absolute temporal frame reference ('the day/s following speech time') and a relative one '(in the) morning.' A number of familiar European languages also exhibit this polysemy.

[23] Wilkinson (2012:585) notes that generic nominals *walu* 'sun, time' and *wäŋa* 'home, place' often appear in these expressions. The occurrence of *wäŋay* in these contexts (e.g. 193) suggests a further extension of the

(193) **Productive derivation of temporal frame from nominal**

bala *ŋayi* *yaryu'~yaryu-n* ***ḏaŋga-y*** ***wäŋa-y***
MVTAWY 3S wade~REDUP-**I** **fine-ERG** **place-ERG**

'Then he went along the water's edge (hunting) while it was fine out (not raining).'
(Wilkinson 2012:159)

4.7 Subordination

In this section, I outline the formal strategies used to introduce subordinate clauses. This is relevant for current purposes given that, among their functions, is subordinate clauses' ability to restrict temporal and modal quantificational domains (*i.e.* they can be used to explicitly establish the 'reference time' or 'modal base' of a given semantic operator, see Roberts 1995).

In an unpublished manuscript, **?** discusses three 'complementation strategies' used in Djambarrpuyŋu, examples of each are provided in (194-196).

(194) **Nominalised complement**

a. *djamarrkuḻi'* *ga* *galkun* *mälu-w* *gondha-nhara-w*
children IPFV.**I** wait-**I** father-DAT fetch-**IV**-DAT

'The children are waiting for their father to fetch them.' (**?**:5)
(lit. The children are waiting for father-fetching (them))

b. *ŋayi* *rirrikthu-rr* *nyaŋ'thu-nara-y* *maypal-yu* *dharrwa-y*
3S sick-**III** eat-**IV**-ERG shellfish-ERG many-ERG

'They're sick from eating too many shellfish' (Wilkinson 2012:629)
(lit. (Her) much-shellfish-eating sickened her.)

(195) **Serialisation**

Ŋarra *dhu* *birrka'yu-n* *guŋga* *mak* *warkthu-n*
1S FUT try-**I** pandanus maybe work-**I**

'Maybe I'll try to work the pandanus (prepare it for weaving).' (**?**:30)

(196) **Subordinate clausal complement**

Ŋarra *marŋgi* *ŋunhi* *ŋayi* *Wämut-thu* *yaka* *ŋatha* *gi* *nyaŋ'thu-rr*
1S know ENDO 3S *MÄLK*-ERG NEG food IPFV.**II** eat-**II**

'I know *Wämut* won't eat the food.' (**?**:21)

The first strategy (*e.g.* 194) involves the insertion of a nominalised verb (i.e. one that is inflected with the "long-form" of the **IV** inflection)[24] that is inflected for nominal case

spatiotemporal metaphor pervading the grammar (where 'place' is used to signify some temporal stage.)

[24]The **IV** inflections have a disyllabic variant (with the addition of *-ra*, a formative that (**?**:4)) refers to as a 'thematic affix.' The long form appeats only to surface in nominalised verb forms with unimoraic suffixes, i.e. *marrtjinyaraw* 'go.**IV**.DAT' but *marrtjinyalil* 'go.**IV**.ALL'.

(DAT in this instance), giving rise to a PURPOSIVE reading). In (a), the nominalised verb *gondhanaraw* 'fetch' appears to enter into a constituent with its agent argument *mäluw*, both items receiving DAT (purposive) marking. Similarly, in (b), the entire event description 'many-shellfish-eating' is ergatively marked (although the 3s NOM subject is understood as the subject of both eating and 'being.sick' eventualities.)

The second case (195) involves the cooccurrence of two fully- (and identically-)inflected verb forms, ostensibly in a single clause. The range of verbs that are available to participate in serialisation (and the division of semantic labour between the verbs in these constructions) is at present poorly understood (see **?**:27ff). Aspectual verbs (of the *ŋurruyirr'yun* 'begin', *dhawar'yun* 'finish'-type) tend to occur in these constructions (see also discussion of potential serialisation in §4.4.1). Importantly, Wilkinson's "serialised predicates" appear to describe a single event between them (sc. 'mono-eventive.') Consequently the reference time of the events described by serialised predicates is taken to be identical.

Most importantly for current purposes is the "embedding"[25] of finite (subordinate) clauses. Syntactically subordinate structures are used in Djambarrpuyŋu to introduce relative clauses (describing NPs), to establish temporal frames and to introduce conditionals. Subordinate clauses predominantly are introduced with *ŋunhi* – a form discussed above in its function as a distal demonstrative (ENDO), although as seen in §4.5, *ŋuli* (HAB/HYP) alternates with *ŋunhi* to introduce conditional antecedents.[26] *wh*-words are also deployed in a relativising function. A number of these subordination functions are briefly described below.

4.7.1 Nominal relativisation

Relative clauses are generally introduced with *ŋunhi* 'ENDO'.[27] Examples of relative clauses are given in (197) below. Note the ambiguous syntax of (197d), where *ŋunhi* appears to fulfil a demonstrative function for *weṯi* (the object of the matrix and subject of the relative clause.)

aybe check for
h-island-type constraints
demonstrate the relpro
atus of *ŋunhi*

(197) **Relative clauses**

a. *Way, marŋgi nhe (ŋarra-kalaŋa-w bäpa-'mirriŋu-w-nydja* ***[ŋunhi*** *[ŋayi*
hey know 2s 1s-OBL-DAT father-PROP-DAT-PROM **ENDO** 3s
*dhiŋga-**ma**-ny ŋuriŋi bala dhuŋgara-y]])*
die-**I**-PROM ENDO-ERG then year-ERG

'Hey, did you know my father, who died last year?' (Wilkinson 2012:343)

b. *ŋurik ŋarra djäl (guya-w [* ***ŋunhi*** *[(ŋayi) ḏarrkthu-rr wämut-nha*
ENDO.DAT 1s want fish-DAT ENDO (3s) bite-**III** *MÄLK*-ACC
]])

'I want that fish such that (it) bit *Wämut*.' (**?**:22)

[25]Note that Wilkinson comments (2012:656) that Djambarrpuyŋu appears to evince Hale's (1976) analysis of 'apposed/adjoined' subordinate constructions (as opposed to "embedded" ones) in Australian languages.

[26]Note that, as shown in table 4.5 and discussed by Wilkinson (2012:254??), *ŋunh-* and *ŋul-* appear to vary as distal demonstrative stems. This may point to a common/similar source.

[27]Note that demonstrative (pronouns) are frequently cited as the most common lexical source of relativisers (e.g. Diessel 1999, Hendery 2012 a.o.). This diachronic trajectory is attested in English (*viz.* for *that*) and is a phenomenon documented in other Australian languages (e.g. McConvell 2006 for Ngumpin-Yapa.)

c. *Ḏirramu-y dharpu-**ŋal** (weṯi' [**ŋunhi** [barpuru **ga** dhiyal **nhina**]])*
man-ERG spear-**III** wallaby **ENDO** yesterday IPFV.**I** PROX.LOC sit.**I**

'The man speared the wallaby which was sitting here yesterday.'
(Tchekhoff 1985:575)

d. *Bili ŋarra buma-**r** (ŋunhi weṯi' ŋatha li ga l̪uka)*
CPLV 1S kill-**III** ENDO wallaby food HAB IPFV eat.**I**

'I killed the wallaby which was eating the food.' (Tchekhoff 1985:576)

e. *...yaka nhuma marŋgi waluwnydja ŋunhi nhätha dhu dhuwal mala-ny*
NEG 2P know time-DAT-PROM ENDO when FUT PROX group
rom maḻŋ'thun
law appear-**I**

'...you don't know of the time such when the law people will appear.'
[Mathuyu 25.13]

this is speculative and needs to be checked. Also the function of *ŋuli* in this sentence is unclear and may suggest that my interpretation isn't the right one (although would still point to a RelTns analysis i think) – T's translation is pretty ambiguous.

Interesting for current purposes is the temporal relation that obtains between the matrix and the subordinate predicate. In (197d), the matrix verb *bumar* 'kill.**III**' is interpreted as TODAY PAST. It is understood that the wallaby's food-eating event was in-progress at its time-of-death. Consequently, the primary inflection on *l̪uka* 'eat.**I**' is evaluated as a present-tensed event *relative to a reference time set by the matrix clause.* This is further discussed below in Chapter 5.

4.7.2 Temporal relativisation

ŋunhi also introduces temporal adjuncts, which function to set a reference time for a predicate. Example of this function are given in (198) below. In all cases the instantiation time of the event described in the matrix clause is understood to obtain at that time set by the *ŋunhi*-clause.

(198) **Temporal binding**

a. *Ŋunhi ŋarra dhu roŋiyi, ŋarra dhu nhuna nhä-ŋu*
ENDO 1S FUT return.**II** 1S FUT 2S.ACC see-**II**

'When I come back, I'll see you' [MD 20180802]

b. ***Ŋunhi** ŋayi ga nhakun mar'yu-n-a, ŋayi dhu lakara-ma-n, wo*
ENDO 3S IPFV**I** like be.ready-**I**-SEQ 3S FUT tell-**I**-SEQ or
dharpu-ma-n
spear-**I**-SEQ

'When they are are ready, they will speak or spear.' (Wilkinson 2012:658)

c. ***Ŋunhi** dhu walal bawalamirri+ŋur+nydja dhärra wuthaŋiny+ŋur, ŋayi+ny*
ENDO FUT 3P wherever-LOC-PROM stand.**I** wind-LOC 3S-PROM
dhu warrpuru+n walalany nhuma+n bäwarra̱n'+thu+ny
FUT scent-SEQ 3P-ACC smell-**I** animal-ERG-PROM

'When(/if) they stand anywhere in the wind, the animal will smell their scent.'
(Wilkinson 2012:658)

4.7.3 Conditionals

In a manner similar to that described for temporal clauses above, *ŋunhi* (and *ŋuli*)[28] can be used to introduce the antecedent clause (*i.e.* protasis) of a conditional. Examples of these uses are given in (199) below.

(199) ***ŋuli* as the marker for the antecedent of a conditional**

a. ***ŋuli*** *nhe dhu warku'yu-n wuŋgan-nha, ŋayi dhu läwu-m*
HYP 2s FUT annoy-**I** dog-ACC 3s FUT bite-**I**

'If you tease the dog, it'll bite.' (176a rep'd, Wilkinson 2012:351)

b. *Ŋuli nhe dhu gurrupan ŋatha butjigit-na, ŋayi dhu ŋutha-n*
HYP 2s FUT give-**I** food cat-SEQ 3s FUT grow-**I**

'If you feed the cat, it will grow.' [DG 20190405]

c. *ŋäthil ŋarra* ***ŋuli*** *balaŋ l̪iya-ŋamaŋamayun-mi-nya bala ŋarra balaŋ*
earlier 1s **HYP** IRR head-make-R/R-**IV** then 1s IRR
waŋa-nha-n
speak-**IV**-SEQ

'Had I thought of it before, I would have spoken.'
(176b rep'd, Wilkinson 2012:351)

d. **Counterfactual**

Ŋuli balaŋu nhe gurrupana ŋatha butjigitna, ŋayi balaŋu ŋutha-nha
HYP IRR 2s give-**IV** food cat-SEQ 3s IRR grow-**IV**

'If you had fed the cat, it would have grown.' [DG 20190405]

4.7.4 Propositional attitudes

Ŋunhi is also frequently used to introduce a complement clause for a propositional attitude. Examples are given in (200-202). Note that, similarly to other instances shown above, the boundary between demonstrative and complementiser uses of this lexical item is fuzzy. In (200b) *ŋunhi* appears to be the object argument of *märr-yuwalkthin* 'believe.**I**.' On this analysis *ŋunhi* can be understood to be, in effect, coreferential with the entire embedded proposition.

fc investigating different ombinations of time and he relationship between the me of the embedded prop nd and the attitude pred is n elicitation goal. It seems e it'll be a bit of a task to et up contexts to establsh his.

(200) **Belief (doxastic) predicates**

a. ***märr-n̪iṉ'thu+rr*** *ŋarra nhanukal* [***ŋunhi*** *mak ŋayi dhu rraku ŋunhi*
so-ponder-**III** 1s 3s.OBL ENDO maybe 3s FUT 1s.DAT ENDO
bäyŋu-n bäy-lakara-ma-ny]
NEGQ-SEQ until-tell-**I**-PROM

'I believed (of her) that she mightn't forgive me." (Wilkinson 2012:662)

[28]Following Wilkinson (2012), *ŋuli* is described in §4.5 above as having a HYPOTHETICAL function, which can mark conditional antecedents. Wilkinson claims that *ŋuli* and *ŋunhi* are probably in free variation in these cases (or at least that it is unclear whether any semantic distinction is encoded in the choice of one of these subordinators over the other (2012:667)). Note that both *ŋunh-* and *ŋul-* appear as alternant stems for distal demonstratives (see Table 4.5 above.)

b. *ŋarra-pi-ny ga-n ŋunhi* ***märr-yuwalk-thi-n*** [*nyäl'yu-rr-a ŋayi*
1S-EMPH-PROM IPFV-**III** ENDO so-true-INCH-**III** lie-**III**-SEQ 3S
ga-n ŋunhi dhäwu-ny lakara-ŋal]
IPFV-**III** ENDO story-PROM tell-**III**

'I believed that the story he told was untrue.' (Wilkinson 2012:662)

c. *wämut-thu ga ŋunhi* ***guyaŋa*** [***(ŋunhi)*** *gutjuk-thu bili märra-ŋal*
MÄLK-ERG IPFV.**I** ENDO think.**I** ENDO *MÄLK*-ERG CPLV get-**III**
mutika]
car

'*Wämut* thought (that) *Gutjuk* had got the car.' (**?**:21)

d. *ŋarra-ny ga-n ŋunhi birrka'yu-rr* [*yanbi balaŋ ŋayi yaka-n ḏo'yu-na*
1S-PROM IPFV-**III** ENDO try-**III** CFACT IRR 3S NEG-SEQ arrive-**IV**
]

'I'd been thinking that she wasn't going to come (but she did).'
(Wilkinson 2012:663)

(201) **Knowledge (epistemic) predicates**

a. *ŋarra* ***marŋgi*** *Wämut-ku* [***ŋunhi*** *ŋayi dhu gi bäyŋu-n ŋatha*]
1S **know** *MÄLK*-DAT **ENDO** 3S FUT IPFV.**II** NEGQ-SEQ food

'I know of *Wämut* that he won't finish the food.' (**?**:22)

b. *yaka marŋgi dhuway nhaltja-n walal dhu ga djäma ŋanya*
NEG know FASICOU do.what-**I** 3P FUT IPFV.**I** work 3S.ACC

'*Dhuway*$_i$ doesn't know what they'll do to him/her$_j$.' (Wilkinson 2012:661)

mbedded Q: maybe not gr8
xample

redicts that whatever
ey're doing is same-day as
huway's knowledge state.
resumbaly *marnyi* forcibly
eceives a present interp.

(202) **Desire (bouletic) predicates**

a. *ŋuriki waḻu-w ŋarra ga djälthi-rr* [*ŋayi dhu ḏarrkthu-n*
ENDO.DAT dog-DAT 1S IPFV.**I** want-INCH-**I** 3S FUT bite-**I**
nhuna-ny]
2S-ACC

'Of that dog, I want that it bite you.' (**?**:23)

4.7.5 Other complementisers

In addition to (or in conjunction with) *ŋunhi*, a number of other expressions (including interrogative pronouns *wanha* 'when', *nhätha* 'who' etc.) introduce subordinate clauses. These are surveyed in chapter 12 of Wilkinson (2012) — expressions of particular relevance for current purposes are briefly described below.

Indefinite spatio-(temporal?) location

In a set of constructions related to relative clauses, noun phrases with indefinite reference can be introduced by interrogative pronouns, optionally in conjunction to *ŋunhi*. These intensional clauses can denote a description of an indefinite spatial (203) or temporal (204) location. Consequently they invoke a temporal ordering between the two clauses.

uestion is to what degree
he same construction (prob
nhätha) can describe
mes? Wilkinson (659)
oesn't make any reference
this possibility...

his sentence seems to
uggest an answer my
uestion but can be clarified
the field

(203) **Indefinite spatial location**

a. *dhika ŋarra gapu meŋ̲gul-ŋal* ***wanha*** *ŋarra nhirrpa-r*
INDEF 1S water forget-**III** **where** 1S put-**III**

'I forgot where I put the water.' (Wilkinson 2012:663)

b. *dhika ŋarra yothu-ny meŋ̲gu-ŋal* ***wanhawal****-a ŋarra yorrku-ŋal-nydja*
INDEF 1S child-PROM forget-**III** **to.where**-SEQ 1S lay.down-**III**-PROM
ŋanya
3S.ACC

'I've forgotten where I've lain the child down.' (Wilkinson 2012:663)

(204) **Indefinite temporal location**

...yaka-n nhuma marŋgi ŋuriki-yi-ny walu-w ***ŋunhi nhätha*** *ŋarra*
NEG-SEQ 2p know ENDO.DAT-ANA-PROM sun-DAT **ENDO** **when** 1S
dhu buna.
FUT strike.**I**

'...And you won't know the time when I will strike.' [DB Rev 3.3]

Causal and sequential complements

A number of other constructions appear to encode logical relations between two clauses. Examples of these clause-linkers are shown below and include *märr ga* 'so that' (205), *bili* 'because' (206) and *bäy* 'since, until' (207).

(205) ***märr ga* 'so that'**

bäpa-mirriŋu-y märra-ŋal ŋändi-mirriŋu-ny, ***märr ga*** *ŋayi-n dhu dhägir'yun*
father-PROP-ERG get-**III** mother-PROP-ACC **so that** 3S-SEQ FUT punish.**I**
djamarrkuli'-nha-ny
children-ACC-FOC

'Father fetched Mother so she would punish the children.' (Tchekhoff 1985:574)

bili, described in other functions in §§4.4.2,4.6.1 above, also appears as a type of clause linker, encoding a causal/implicational relation between two propositions.[29]

[29]A proposal for a unified semantics for *bili* is provided below in Chapter 5 **(maybe)**. This analysis understands *bili* not as a clause-linker but a marker of speaker mood/illociutionary force from which 'because' readings emerge pragmatically.

(206) ***bili* 'because, CPLV'**

a. *bala-n limurr dhu marrtji märi-wal*
MVTAWY-SEQ 1p.INCL FUT go.**I|II** MoMo-OBL

***bili** ŋalinyu ga djäl-thi-rr märi-w walala-ŋ nhä-nhara-w*
CPLV 1d.INCL IPFV.**I** want-INCH-**I** MoMo-DAT 3p-DAT see-**IV**-DAT

'We will go to *märi*'s because we (2) want to see the *märi* clan.'
(Wilkinson 2012:669)

b. *ŋunhi-yi-n ŋayi-ny NAME-y-ny'tja märra-ŋal l̲urrkun' yan, yaka*
ENDO-ANA-SEQ 3s-PROM NAME-ERG-PROM get-**III** few EMPH NEG

dharrwa
many

***bili** nhakun galki-thi-n nhanŋu walu rerri-w*
CPLV like close-INCH-**III** 3s.DAT time sick-DAT

'G...a only took a few (wives), not many; because his time was getting close due to sickness.' (Wilkinson 2012:669)

Wilkinson (2012:670-1) additionally identifies the particle *bäy* as a "clausal connective" with a meaning like 'until.' It occurs in collocations with modals, giving rise to apprehensional-like meanings (207a) and with *bala* to mean 'at the same time' (207b).

think vdW has examples here she glosses *baynha* as modal. i may actually have typeset these early in the chapter

(207) ***bäy(-nha)* 'since'**

a. *Nhä-ŋu bulu ŋamatha-ŋ ŋunhi-yi mala-ny djimin̲di-ny' l̲irra*
see-**II** again do.well-**II** ENDO-ANA group-PROM fish spear-PROM teeth

*nhuŋu balaŋ **bäy-nha** gara yätj-thi wo yalŋi-thi l̲irra mala.*
2s.DAT IRR **until-SEQ** spear bad-INCH.**II** or weak-INCH.II teeth group

'Look at your fish-spear prongs properly in case the spear has gone bad or the prongs have loosened.' (Wilkinson 2012:670)

b. ***bäy-nha bala** ŋayi dhu marrtji ŋarra dhu dhiyala nhokal-a ga*
until-SEQ MVTAWY 3s FUT go.**I|II** 1s FUT PROX.LOC 2s.OBL-SEQ IPFV

waŋa
speak.**I**

'While she's going about, I will talk with you here.' (Wilkinson 2012:671)

4.8 Interim summary?

This Chapter has provided a compact description of the lexical devices that Dhuwal speakers use to express concepts associated with the traditional grammatical categories of TENSE, MOOD, MODALITY, ASPECT, POLARITY and EVIDENTIALITY (?). As has been shown, the "labour" of encoding these meaning concepts is shared between the four verbal inflectional classes in addition to a number of auxiliaries, particles and adverbial expressions. A summary of the interpretation of various combinations of the paradigmatic inflections (**I** through **IV**) with a number of frequently-occurring grammatical items that encode related categories

is given in Table 4.9. Taking COMPOSITIONALITY as a methodological principle, the goal of the following Chapter is to make sense of the semantic contributions of each of these forms and to understand how Dhuwal speakers encode these semantic categories (*viz.* intensionalisation).

nticipate some amount of evision of this table...

Table 4.9. Preliminary summary of distribution of verbal inflectional forms and their interaction with auxiliaries (adapting from Wilkinson (2012) and Lowe (1996) on Dhuwal). Data demonstrating all of these uses is appended to this prospectus.
Starred (∗) cells denote that the relevant auxiliary-inflection combination is ungrammatical.
Note that in negative clauses, distinctions between **III/IV** and (for most speakers) **I/II** are neutralised. Consequently, the distribution for **IV** is a superset of **III**'s when the clause is negated.

	∅	*ŋuli* 'HAB/HYP'	*dhu* 'FUT'	*yaka/bäyŋu* 'NEG'	*balaŋ* 'IRR'
I	•PRES •PST (*today)	PRES.HAB	•FUT today •FUT indefinite	%	?
II	•IMPER •FUT definite		FUT definite (*incl.* tomorrow)	$\supset[\![I]\!]$	
III	•PST today •PST unspecific •ψ states	*	*	*	*
IV		•distant PST.HAB •counterfactual	*?	$\supset[\![III]\!]$	PST.IRR

Chapter 5

The Yolŋu language of intensionality

The previous chapter (Ch. 4) introduces a number of challenges for our theories of natural language semantics. Here, I provide an analysis of these phenomena, in an effort to demonstrate the utility of formal approaches to semantics and pragmatics in understanding the linguistic strategies deployed by Yolŋu Matha speakers to displace and intensionalise discourse. The analysis that follows is based on the Dhuwal language variety described above. The following chapter considers the substantial linguistic variation that occurs across the Yolŋusphere and proposes a diachronic account of the emergence of these phenomena.

The goal of this chapter (and a central aim of the dissertation) is to shed light on the meaning contributions of verbal inflections and other particles that are used in Yolŋu Matha to instantiate grammatical categories including tense, modality, polarity, aspect and evidentiality. The diagram in Figure 5.1 represents an attempted schematisation of the Djambarrpuyŋu 'TMA system' from Wilkinson's detailed description of the language (2012:362). This diagram makes manifest the ways in which the conventional meanings associated with this language's verbal inflection diverge from those of more familiar languages and underscores the difficulty of proposing a unified semantics, compositional for Yolŋu inflectional categories.

In §5.1, I explore the notions of "cyclic" and "metrical" tense that are manifested in a number of Yolŋu Matha varieties (as well as the unrelated non-Pama-Nyungan languages spoken elsewhere in Arnhem Land) and in §5.2, I consider interactions between speaker mood and felicity conditions for the verbal inflections.

5.1 Temporal expression in Western Dhuwal(a)

milarly, probably too pecific a heading — need ther temporal expression bove this or cyclicity below his? the section atm cludes a discussion of xical and grammatical spect.

In §4.1, I provided a description of the distributional facts of the four 'inflectional classes' of Dhuwal(a). As we saw, these inflections are in a paradigmatic relation; all finite verbs receive exactly one inflection (caveat the formal identity of some of these inflections in particular verb classes (*sc.* 'conjugations.')) In the Western Dhuwal(a) varieties (as in other Yolŋu languages) verbal inflections play a central role in temporal expression. The basic function of inflections **I** and **III** in determining the temporal location of a predicate, for example, is shown in (208).

hese examples are onstructed: need to be hecked

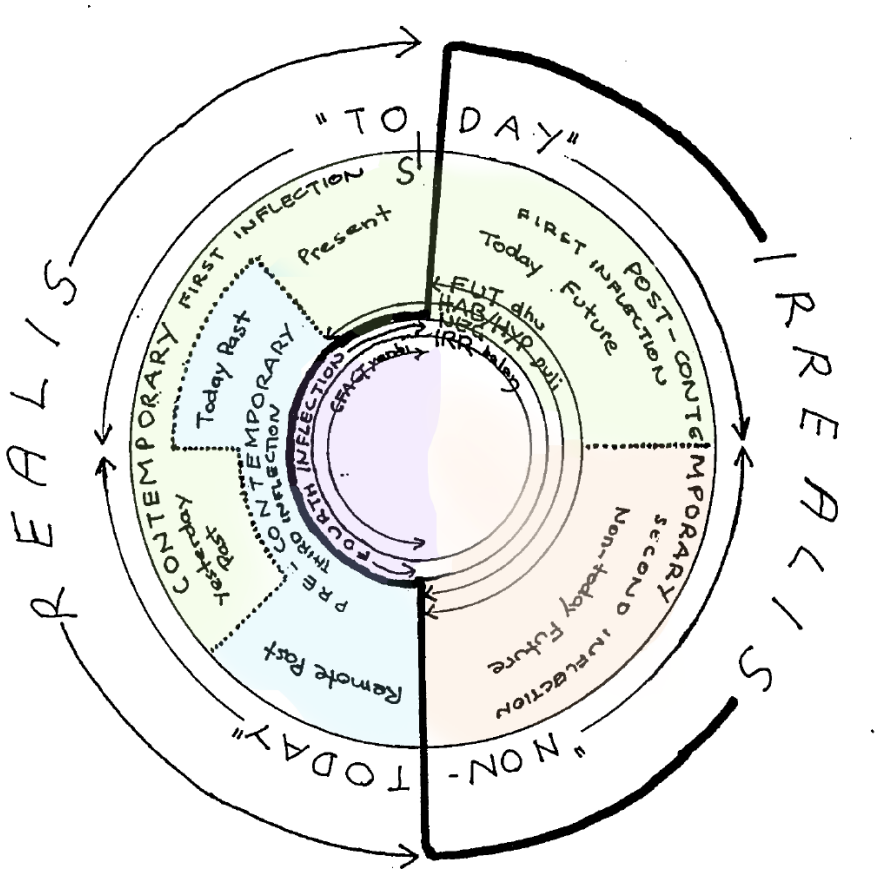


Figure 5.1. Melanie Wilkinson's diagrammatic treatment of the distributional properties of Djambarrpuyŋu's four verbal inflections (2012:362). Colourised by author for facilitated presentation of the 'domains' of the four inflections.

(208) **Temporal contributions of I and III**

a. PRESENT TEMPORAL REFERENCE with **I**

gäthura	*ŋarra*	*ga*	*nhina-∅*	*wäŋaŋura*
today	1s	IPFV.**I**	sit.**I**	home.LOC

'I am staying at home today.'

b. PAST TEMPORAL REFERENCE with **III**

gäthura	*ŋarra*	*ga-na*	*nhina-**na***	*wäŋaŋura*
today	1s	IPFV-**III**	sit.**III**	home.LOC

'I was sitting at home (earlier) today.'

The data in (208) suggest a present-past distinction encoded by **I** and **III** respectively (which is a reasonable analysis for the cognate paradigm in other varieties, see Ch 6). However, as discussed in Ch. 4, data of the type shown in (209) quickly throw up problems for a straightforward tense-marking account of these inflections.

(209) **Temporal contributions of I and III (non-today frame)**

a. RECENT PAST with **I**

Ŋarra ḻuka mänha barpuru
1s drink.**I** water yesterday

'I drank water yesterday.' [BM 20190405]

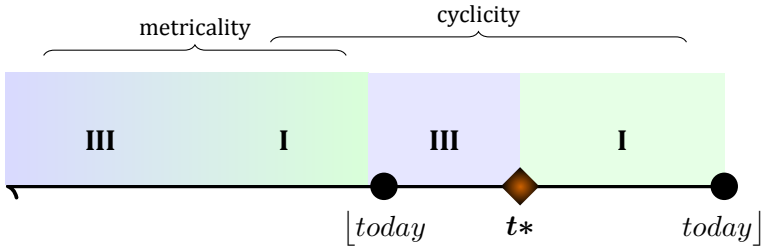
b. REMOTE PAST with **III**

*Ŋunhi ŋarra yothu yäna, ŋarra marrtji-**na** Sydney-lili*
ENDO 1s child only, 1s go-**III** Sydney.-ALL

'When I was a kid, I went to Sydney.' [BM 20190405]

Represented in Figure 5.1, A major consequence of these data is that, assuming a model where times are naturally, linearly ordered, the intervals to which **I**- and **III**-inflected predicates can refer are DISCONTINUOUS. Figure 5.2 schematises this discontinuity.

Figure 5.2. Past-time temporal expression in the Yolŋu Matha varieties of Central Arnhem, demonstrating two descriptive phenomena: (a) cyclicity — the interspersion/discontinuity of **I** and **III** forms and (b) metricality — the (subjective) division of the past domain between these two forms.
$\lfloor today \rfloor$ indicates the boundaries of the privileged interval *today*. $\boldsymbol{t}*$ is utterance time.



Previous accounts of this phenomenon have described the data in terms of the oppositions between two binary categories: "contemporary" (**I**) vs. "precontemporary" (**III**) tense marking and a contextually provided "today" and "non-today" reference frame. This interaction was shown in Table 4.3 (*p.* 109), each cell of which is represented by one of the datapoints in (208-209). This schema introduced by Glasgow (1964) for Burarra data [bvr], terminology adopted and adapted by numerous other authors for languages of Arnhem Land (see Eather 2011, Green 1987, 1995).

While, as cited above, Comrie (1985:89) recommends 'appeal to its rarity as an excuse for according it [cyclic tense] marginal status in the theory', the current work contends that we should be desirous of a "unified" semantics for each of the verbal inflections. The following sections consider the status of the WD verbal inflections and the relation they bear to temporal expression.

5.1.1 Talking about the present

his section needs to go omewhere — specific rguments against an aspect-based system" being t the core of the temporal xpression in djr. It's less ear that this is the place.

> [T]he present is like the window of a railway carriage in which we are sitting. If it were an infinitesimal slit we could not see out properly, and we could not see the countryside laid out with its features in their proper relations; but

> since it has a width light can enter and we can see each thing in relation to the next and so form for ourselves a picture of the whole... (Hamblin 1972:325)

The obligatory occurrence of *ga* 'IPFV.**I**' with present-tensed event descriptions has led some authors (e.g. Heath 1980a:46)[1] to describe this item as a present-tense marker. As we will see here, this is not the most parsimonious analysis of the Dhuwal(a) inflectional system. The categorical appearance of *ga* (or, in fact, other aspect morphology) is, I will argue, an epiphenomenon of to the well-understood incompatibility between PRESENT and PERFECTIVE (Comrie 1976:66*ff*, Smith 1997:110, Malchukov 2009 a.o.) in addition to a LEXICAL CONSTRAINT on the situation aspect (Aktionsart) of verbal predicates in W Dhuwal(a). An analysis that treats *ga* as encoding a present tense presupposition, in fact can be dismissed by data such as those in (210) where the reference time for each sentence is clearly located in the past of utterance time.

(210) ***ga* 'IPFV.I' in past-referring sentences**

a. *barpuru ŋali **ga** waŋanha-mi-rr*
yesterday 1d.INCL **IPFV.I** speak.IV-RECIP-**I**

'We were speaking to each other yesterday.' [AW 20190426]

b. *nhä nhe **ga** djäma barpuru?*
what 2s **IPFV.I** work yesterday

'What were you doing yesterday?' [DhG 20190413]

c. *ŋäthili dhuŋgarra-y djäma ŋarra **ga** shopŋura*
previous year-ERG work 1s **IPFV.I** shop.LOC

'Last year I was working at the shop.' [BM 20190416]

In fact, there is significant evidence that all verbal predicates in Dhuwal(a) (or at least those varieties spoken in Ramingining) are lexically event-denoting. This has already been suggested by the data in (161), where stative concepts like BE SICK and BE TIRED appear to be implicated by (de-nominal) **III**-inflected verb forms (literally *rirrikthurruna* "I became sick"⇝ 'I am (currently) sick'). This is shown in (211a). Explicit predications about current states may require periphrasis (e.g. the nominal predication in 211b). Meanwhile, the *ga*-marked **I** form (c) results in a state-change reading. Relatedly, in (212), *gutharra* is understood to be in the process of asking for food in view of her current 'hunger' state. That her hunger holds in the present is an implicature of a past-tensed eventuality of 'becoming hungry.'

(211) ***rirrikthun* 'sick': state or state-change denoting?**

a. *Ŋarra rirrik-thu-**rruna***
1s sick-VBLZR-**III**

'I'm sick.' [BM 20190405]

[1]Compare with Table 4.2. Note that Heath suggests that 'the [temporal] value of [**I** and **II**] depends on context, including the presence of particles. He does not attempt a compositional analysis of the verbal inflections (1980a:38,46). Additionally, in various texts *ga* (similarly to *gan*) is glossed as a DURative marker. He does, however, suggest that in various dialects of Dhuwal (particularly Djapu', the variety that seems to diverge more from the Western Dhuwal(a)) that marking this category is uncommon (and in fact the auxiliary may be inflection-invariant.)

b. *Ŋarra dhäkay-ŋänha-mirri rirrikthu-**n***
1s feeling.ERG-hear.**IV**-PROP sick-INCL-**I**

'I'm feeling sick.' [BM 20190405]

c. *Dhuwala ŋarra ga rirrikthu-**n***
PROX 1s IPFV.**I** sick-INCH-**I**

'I'm getting sick.' [BM 20190405]

his example is the guf title om Waymamba aykamaŋu's 20171208 anslation of a djr text omposed by Galathi hurrkay from 20141015

(212) ***djaṉŋarrthin* 'hungry': post-state & present-predication**

Gutharra-y ga waŋa märi-nha ŋatha-wa bili ŋayi djaṉŋarr-thi-na
DaCh-ERG IPFV.**I** speak.**I** MoMo-ACC food-DAT because 3s hunger-INCH-**III**

'*Gutharra* asks *märi* for food because she's hungry.' []

As well as derived (de-nominal) verbs, simplex verbal stems with psychological (incl. perception) semantics — e.g. *nhäma* 'see', *dharaŋan* 'understand', *guyaŋa* 'think' — seem to lexically encode *events*. When predicating of a presently-holding state, these verbs require imperfective marking. Otherwise, a **III**-inflected form appears to implicate that the post-state of the event described by the predicate still holds. This is shown for *nhäma* 'see' in (213) below. In these cases an (eventive) predicate denotes a bounded, telic type of situation: an ACHIEVEMENT in the sense of Vendler (1957) or HAPPENING per Bach (1986).

(213) ***nhäma* 'see': perception as a telic event**

a. *Ŋarra nhä-**ŋala** wuŋgan*
1s see-**III** dog

'I see the dog.' [BM 20190405]

b. *Ŋarra **#(ga)** nhä-**ma** wuŋgan dhiyaŋu bala*
1s #(**IPFV.I**) see-**I** dog ENDO.ERG MVTAWY

Intended. 'I'm watching the dog currently.' [BM 20190405]

Additionally, Wilkinson (2012:557) describes a 'minor [word] class' : the "adjectival"-predicates. These three commonly-occurring predicates are all lexical statives (whose semantics correspond to those for the category of *psych verbs* cross-linguistically): *djäl* 'want, like', *marŋgi* 'know' and *dhuŋa* 'not.know.'[2] Morphosyntactically, each takes an intransitive frame (selecting for a NOM experiencer and DAT theme) and resists co-occurrence with verbal particles (*i.e.* aspect marking). Like other nominal elements, productive suffixation (notably *-thirr(i)* 'INCH.**I**', *-kum(a)* 'CAUS.**I**' and *-thun/-'yun* VBLZR.**I**) is available to derive verbal forms (intransitive and transitive, respectively). The contrast between the two continuations in (214) below shows incompatibility between stative predicate *djäl* 'like' and aspect marking (a), which, conversely, is obligatory for the derived verbal predicate in (b). A similar effect is shown for the predicate *marŋgi* 'know' (215), where the eventive ("change of state") semantics of the verbal predicate *marŋgithirr(i)* 'learn ≈ come to know' are transparent.

[2]These verbs also have a range of circumstantial modal readings (ability, bouletic, preferential), perhaps predictable given their propositional attitude-type semantics. Examples of these readings are given in 216, and additionally in Wilkinson 1991:648.

(214) **Stative *djäl* 'like, want': incompatible with *ga* 'IPFV' marking**

*Ŋäthili ŋarra bäyŋu **djäl** l̪atjin'-gu...*
previously 1s NEGQ like mangrove.worm-DAT

'I didn't used to like *l̪atjin*...

a. ... *dhiyaŋunydja bala ŋarra (*ga) **djäl** l̪atjin'-gu*
now 1s (*IPFV) like *l̪atjin*-DAT

b. ... *dhiyaŋunydja bala ŋarra *(ga) **djäl-thi-rri** l̪atjin'-gu.*
now 1s *(IPFV) like-INCH-**I** *l̪atjin*-DAT

'...now I do like them.' [DhG 20190417]

(215) **Stative *marŋgi* 'know' incompatible with *ga* 'IPFV' marking**

a. *Ŋarritjan (*ga) **marŋgi** Baŋaḏi-wa*
MÄLK (*IPFV.**I**) know *MÄLK*-DAT

'*Ŋarritjan* knows *Baŋaḏi*.' [DhG 20190417]

b. *Dhiyaŋu bala Wamuttjan **ga** **marŋgi-thi-rri** Bäŋaḏi-wa*
now *MÄLK* IPFV.**I** know-INCH-**I** *MÄLK*-DAT

'*Wamuttjan* is getting to know (learning about) *Baŋaḏi*.' [DhG 20190417]

Similarly, the stative predicate *dhuŋa* resists aspectual marking. (216a) shows the establishment of a (remote past) reference time with a subordinate temporal clause while (b) shows how the corresponding verb form (as with its counterparts in the examples above) requires explicit imperfective marking for a present stative predication.

(216) **Stative *dhuŋa* 'ignorant'**

a. *Ŋunhi ŋarra yothu yän, ŋarra **dhuŋa** l̪upl̪upthunara-w*
ENDO 1s child only, 1s ignorant swim.**IV**-DAT

'When I was a kid, I couldn't swim.' [AW 20190429]

b. CONTEXT. I decline an invitation to dance at a forthcoming ceremony.
i. — *Ŋarra **dhuŋa** girritjinara-w*
1s ignorant dance.**IV**-DAT
ii. — *Bili nhe ***(ga)** **dhumbal'yu-n*** for the step/the beat.
because 2s *(IPFV.**I**) not.know-**I**

— 'I don't know how to dance (at the *buŋgul̪*).'
— 'Because you don't know the steps, the beat.' [AW 20190429]

The behaviour of these nonverbal predicates (i.e. their resistance to explicit aspect marking) is consistent with cross-linguistic behaviour of stative predicates.[3]

[3]By way of examples:

- The infelicity on progressive-marking of stative verbs in English (e.g. Dowty 1979:55, Taylor 1977:205 a.o.)
- Whereas dynamic verbs in Russian all appear with imperfective and (inflected) perfective stems, the latter is unavailable for stative verbs (Smith 1997:227).

So far in this section, we have seen evidence of an organising principle in W. Dhuwal(a) where all verbal (inflecting) predicates lexically encode eventive (dynamic) situations which are temporally bound (i.e. have endpoints). This principle is formulated in (217).

(217) **VERBAL STEMS AS INHERENTLY EVENTIVE IN W. DHUWAL(A)**
W. Dhuwal(a) verbal predicates denote properties of events.

As mentioned above, situations that obtain in the present 'must be open and unbounded, without endpoints... ongoing events; particular states and general states' Smith (2008:230). This is formulated as a basic pragmatic principle as the constraint in (218).

(218) **THE *BOUNDED EVENT* CONSTRAINT**
Bounded situations may not be located in the present. (Smith 2008:231)

A consequence of the interaction of the two contraints in (217) and (218) is that **unmodified verbal stems** (which denote bounded, eventive situations) **are infelicitous with present temporal reference**. As we have seen here, W. Dhuwal(a) encodes stative situation types by way of three strategies:

(219) a. nominal predications,
b. post-state implicatures (through both derived and simplex past-denoting predicates) or
c. the explicit marking of imperfectivity (normally with inflecting auxiliary *ga* or stance/motion verbs (see § 4.4.1) or with the habitual marker *ŋuli*.)

In fact, Dowty (1979, 1986) — along with Taylor (1977) — defines criteria for progressive marking and stative sentences which theorise that "no matter what the aspectual class of the lexical verb" any progressive-marked sentence will be stative. These conditions as laid out in Dowty (1986:42-4) are recapitulated in (220) below:

's not super clear that this oesn't belong in a lit eviewy section which then ets cross-referenced here. lso the semantics for the ROG is fine for current urposes (may not as we ontinue forward but it gets he imperfective-stative heorem)

(220) a. **STATIVE CRITERION (the 'subinterval property')**
$\textsc{stative}(\varphi) \leftrightarrow \varphi(i) \rightarrow \forall i'\big(i' \sqsubseteq i \rightarrow \varphi(i')\big)$
A sentence φ is stative iff it follows from the truth of φ at i that φ is true at all of i's possible subintervals i'
b. **A SEMANTICS FOR THE PROGRESSIVE**
$\textsc{prog}(\varphi)(i) \leftrightarrow \exists i'\big(i' \sqsupset i \wedge \varphi(i')\big)$ The progressive form of $\varphi(i)$ is true iff there is some proper superinterval i' at which φ is tue.

That progressive-marked sentences necessarily meet the stative criterion is deduced in (221) below.

- In Navajo, 'overt viewpoint [aspectual] marking' only occurs in non-stative sentences(Smith 1997:297).

(68) c.. ***Theorem.*** *Progressive-marked sentences entail stativity (the subinterval property holds.)*

i.	$\text{PROG}\varphi(i)$	*PREMISE*
ii.	$\exists i' \sqsupset i \wedge \text{PROG}\varphi(i')$	(220b), i.
iii.	$\forall i''(i'' \sqsubseteq i \rightarrow i'' \sqsubseteq i')$	def. $\sqsubseteq$, ii.
iv.	$\text{PROG}\varphi(i'')$	(220b), i,ii i.
v.	$\text{PROG}\varphi(i) \rightarrow \forall i''\big(i'' \sqsubseteq i \rightarrow \text{PROG}\varphi(i'')\big)$	i,iii,iv
vi.	$\text{STAT}\big(\text{PROG}\varphi(i)\big)$	(220a) $\square$

All this is to suggest that all W. Dhuwal(a) verbal predicates denote properties of bounded events, a class of situations that are incompatible with present temporal reference. Nominal predication (including the adjectival and locative predicates) and sentences with imperfective marking denote states. Consequently, all verbal predicates obligatorily cooccur with *ga* 'IPFV.**I**' when referring to a presently-holding state.

5.1.2 Modelling present predication

nsure about the nplications of this direction ather than (the prima facie erhaps more tuitive/standard claim) hat verb stems select for flection i.e. are fact this doesn't make ense really if the inflections re just going to quantify ver intensions..... it would ave to be the em...hnnngggg

This apparent lexical constraint can be modelled in the semantics for the W. Dhuwal(a) verbal inflections. Consequently, our ontology will contain a *domain of eventualities* D_ε partitioned into stative and eventive subtypes. Variables over events will be notated e, over states s, summarised in (221)

(221) $D_\varepsilon \begin{cases} \mathcal{E}_\epsilon & \text{eventive situations} \quad e, e', e'', e''' \\ \mathcal{E}_s & \text{stative situations} \quad s, s', s'', s'''\ldots \end{cases}$

Verbal (inflecting) predicates are then understood to denote properties of events $\langle \varepsilon_e, t\rangle$. These obligatorily combine with an aspectual operator (e.g. *ga* 'IPFV' or $\varnothing$ 'PFV') to yield a predicate of intervals $\langle \imath, t\rangle$. Following the neo-davidsonian approach assumed in Deo 2015a, these operators "map properties of [events] to sets of intervals relative to which these predicates are instantiated via existential quantification over the Davidsonian event variable" (11).

The differential contributions of each inflection are investigated in detail in the remainder of this chapter, although the basic structure of each is taken to The denotation in (222) is intended to capture these shared elements (although will be significantly revised through this chapter.)

(222) **Meaning kernel for the inflectional categories** (temporal contribution: to be revised)
$[\![\text{INFL}]\!]^{i*} = \lambda P : \exists e \in \mathcal{E}_\epsilon[P(e)]\,.\,\tau(e)\,\mathcal{R}\,i*$
The category of INFLECTIONAL SUFFIXES in W Dhuwal(a) presupposes that the situation described by the predicate P is eventive e and (depending on the nature of the inflection) relates the runtime of that event $\tau(e)$ to the evaluation time $i*$.

o this is changed now ased on the fact that the flections are gonna be ken to compose with roperties of intervals (i.e. he semantic domain of **spP**)

Above, we saw examples of derived (de-nominal) verbs with change-of-state semantics. Whereas we have seen that nominal predicates are often used to encode stative situation

types productive suffixation — *-ʔThu-* 'VBLZR', *-Thi-* 'INCH', *-ku-/-Thi-* 'TR' and *-mara-* 'CAUS'[4] — derives inflecting verbal predicates with accordingly eventive semantics.[5] Wilkinson (2012) demonstrates the paradigmatic relation between these predicates. Some examples are given in Table 5.1 below (predominantly from her description) and formal proposals for the contributions of a number of these operators are given in (223) below.

Table 5.1. Morphological derivation of inflecting eventive predicates

STATIVE PREDICATE		***-Thi* 'INCH'**	
baṉḏany	'shallow'	*baṉḏany-dhin*	'dry up.**I**'
gorrmur	'hot'	*gorrmur-ʼyin*	'get hot, have fever.**I**'
buthalak	yellow	*buthalak-thin*	'be(come).yellow.**I**'
STATIVE PREDICATE		***-Thu* 'VBLZR'**	
warwu	'sorrow'	*warwu-ʼyun*	'worry, feel.upset.**I**'
bilma	clapstick	*bilma-ʼyun*	'use.clapstick.**I**'
ŋaḏi	'discontent'	*ŋaḏi-ʼyun*	'sulk.**I**'
STATIVE PREDICATE		***-ku/-Tha* 'TR'**	
baṉḏany	'shallow'	*baṉḏany-kuma*	'dry.**I**'
dhunupa	'straight'	*dhunuka-kuma*	'put.right.**I**'
galki	'close'	*galki-kuma*	'bring.close.**I**'

(223) **The functions of verbal derivation**

a. **A semantics for *-Thi* 'INCHoative'**

i. $\textsc{become}\,\varphi(i) \underset{\text{def}}{=} \exists j[j \underset{\text{init}}{\sqsubseteq} i \wedge \neg\varphi(i)] \wedge \exists k[k \underset{\text{fin}}{\sqsubseteq} i \wedge \varphi(i)]$
A formula BECOME φ is true at i if φ is both: true at a final subinterval k and false at an initial subinterval(j). (Adapting liberally from Dowty 1979)
This is diagrammatised in Figure 5.3. [6]

ii. $[\![\,\textit{-Thi}\,]\!]_{\langle\langle\varepsilon_s,t\rangle,\langle\varepsilon_\epsilon,t\rangle\rangle} = \lambda P^s.\lambda e[\textsc{become}(P^s)(e)]$
-Thi 'INCH' is a situation operator which takes a property of states $P^s \subseteq \mathcal{E}$ and returns the set of events BECOME $P^s \subseteq \mathcal{E}_\epsilon$.

b. **A semantics for *-Thu* 'TRansitiviser'**
$[\![\text{-Thu}]\!]_{\langle\langle\varepsilon_s,t\rangle,\langle e,\langle\varepsilon_e,t\rangle\rangle\rangle} = \lambda y\lambda P^s.\exists e[\textsc{cause}(y, \textsc{become}(P^s)(e))]$
-Thu 'TR' is a situation operator which takes a property of states P^s and returns a function from individuals (agents/causers) to events ($\lambda y.y$ CAUSE BECOME $P^s \subseteq E \times \mathcal{E}_\epsilon$)

eed to revise *-Thu* at least

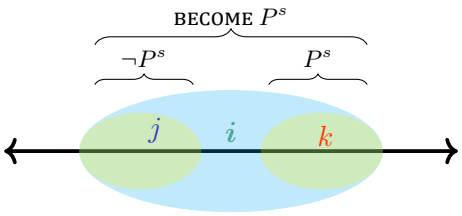
[4]The forms of these suffixes are subject to significant allomorphy. I generalise over each category following the proposals of Wilkinson (2012:§ 7.5).

[5]According to Dowty (1972, 1979), statives are in fact the "basic" predicate type which composes with a finite number of [situation] aspectual operators/connectives to yield predicates of events.

[6]This predicate, labelled COME ABOUT in Dowty's 1972:45ff dissertation appeals to a dense series of moments in time before being updated to an interval semantics in 1979:139ff, following Bennett and Partee (2004). Where Dowty appeals to an initial/final overlap relation ($\circ$), here I replace that with notions of initial/final subintervals which seems to partially avoid some of the problems he discusses (140-2). Nevertheless, as formulated here the definition is still too weak and does permit for i's theoretically unbounded length. Dowty partially solves this by stipulating that i is the largest interval for which these properties hold.

Relevantly for current purposes, the nominal predicates in the first column of table 5.1 are all state-denoting and, consequently, are incompatible with verbal inflections and imperfective marking (sc. *ga*). As (223) shows, on a neo-Dowtian treatment, when verbs are derived from these stative predicates, an eventive interpretation is generated. This captures the intuition that **predicates of events, in effect, denote changes in state over time** ("dynamicity").

Figure 5.3. Truth conditions for state change operator BECOME (adapted from Dowty 1979)



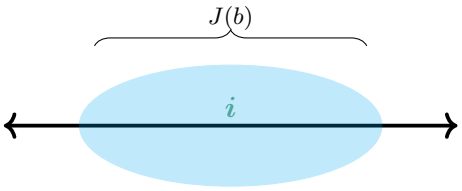
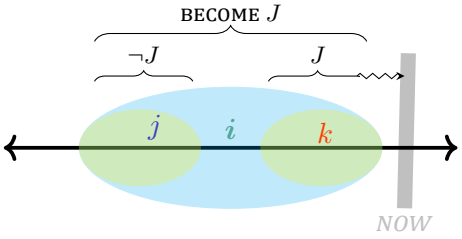
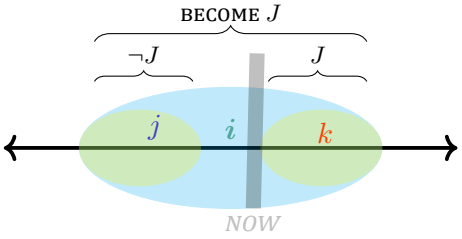
This treatment further evinces the infelicity of present-tensed eventive predication with which we have been concerned so far in this section. Given that eventive predicates of the BECOME-type assert a **state-change** over time, reference to an entire, bounded eventuality of this type must be located within an extended interval in which both P and $\neg P$ hold.

In this subsection we have made the following observations:

- Dhuwal(a) verbal predicates denote properties of events;
- Eventive predication is incompatible with present-reference;
- Properties of states (which are present-tense compatible) are predicated by the three strategies given in (219), spelled out in (224) below.

f course at this stage i
aven't included semantics
r **I/III**

(224) **Strategies for achieving present temporal reference in W Dhuwal(a)**

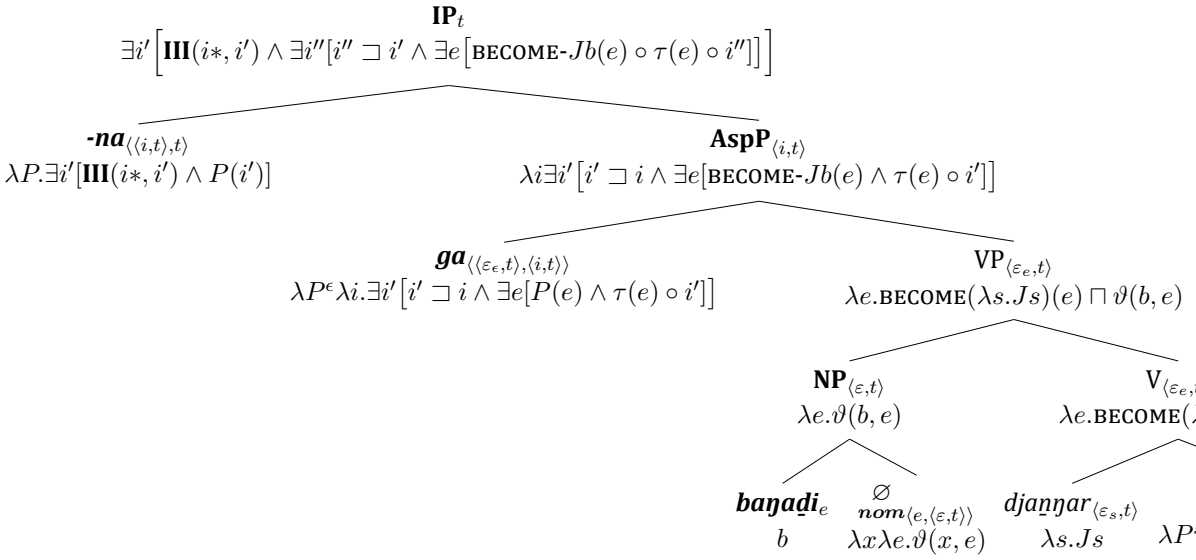
TYPE	EXAMPLE	SCHEMA
nominal	*baŋaḏi djawar-mirr* *MÄLK* tired-PROP $\lambda s.Jb(s)$	
post-state	*baŋaḏi djawar-yu-rr(una)* *MÄLK* tired-VBLZR-**III** $\lambda s.\exists e[\textsc{become}(Jb)(e) \wedge \tau(e) \prec$ **now**$](s)$	
imperfective	*baŋaḏi ga djawar-yu-n* *MÄLK* IPFV.**I** tired-VBLZR-**I** $\lambda s.\exists e[\textsc{become}(Jb)(e) \wedge \tau(e) \sqsupset$ **now**$](s)$	

Note that, in the formal and schematic presentation of the sentences in (224), for the sake of exposition, we are abstracting away from a number of important details, including more sophisticated treatments of properties of IPFV (e.g. the intensional interpretive component of the PROGRESSIVE as first proposed in Dowty (1977))[7] but crucially also a proper account of the contribution of the verbal inflections **I** and **III** in determining temporal reference. We turn to this in the below subsections (§5.1.3). The derivation in (225) below spells out a number of assumptions about the composition of an eventive predication in Gupapuyŋu.

s we've seen, I have the ones of a derivation ready o go on this (assuming I've ot the data right). I need to now what existential osure in order to get it to ome out. Is it a composition ule distinct from fn appl?

(225) **A compositional derivation of *Baŋaḏi ga djaŋŋarthina***
'Baŋaḏi is hungry' (lit. 'Baŋaḏi got hungry')

[7] *Viz.* what has been referred to in subsequent literature as quantification over 'inertia futures/worlds.'



A number of observations to prosify once this analysis has firmed up a bit:

- A nominal predication (PredP) is taken to be a set of states saturated by its theme (absolutive marked argument)
  - This has been kind of modified now s.t. the stative property first composes with a verbalising suffix to derive an eventive property. This probably makes more sense. In a neodavidsonian sort of way I'm kind of abstracting away from how the nominal arguments compose (assuming there's a intersective composition rule $\sqcap$ that modifies the event description (Champollion for a summary). I have absolutely zero-commitment to anything beyond events.)
  - Though this is quite nice in transitive cases where the ergative can be seen as instantiating $\lambda x \lambda e.\textsc{ag}(x,e)$ and the accusative $\lambda x \lambda e.\textsc{pat}(x,e)$. For nominative though, we'd probably need two denotations? maybe not. maybe it'd just be typed more generally... let's see.
- the verbalising suffix *-thi* as shown in (71) above maps a set of states to events of becoming that state. Given that these require inflection ultimately, this is currently modified as a function from sets of states to functions to time-relativised events.
- Viewpoint aspect (IPFV) is a predicate modifier: it takes a set of events and maps it to a predicate of intervals (this meshes with Deo 2015:11)
  - consequence of Aspº introducting i is that i'm gonna need to say that there's a silent PFV operator in complementary distribution with *ga* that introduces a variable over times.
- The verbal inflection then maps a predicate (of intervals?) to a proposition, 'instantiating these properties at reference time' (ibid.)
- There is a typing problem at the AspP level where maybe there's some existential binding of the event variable. Can we just say that this is one of the things that ASP is doing? Or do we need an $\exists$-closure operator in the syntax (with a Champollion-like semantics, i.e $\lambda\mathcal{E}.\exists e[\mathcal{E}(e)]$)? I'm still so confused by what the meaning of this could be? It must just be a theory-internal sleight-of-hand right?

- One thing that is likely to simplify the representation here a wee bit (especially when we move up type-wise and start thinking about modality) is using a COIN relation (kinda Dowty's **AT**). This **does** do the exisntial closure work (acc. Ashwini)
- i presumably needs to be in the syntax somewhere

om memory the following
erse also had a nice
xample of nhäŋal

(226) **Dynamic *nhina***

walal marrtji-n dhaŋal-ku-ŋal-nha gurtha-n l̲ithan-mara-nha-mi-nyara-w-nha
3p go-**III** stoke-CAUS-**III**-SEQ fire-PROM dry-CAUS-NMLZR-RECIP-NMLZR-DAT-SEQ
walala-ŋgu-wuy walal. Bala ŋayiny Betany dhunupan marrtjin,
3p-DAT-ASSOC 3p then 3S.PROM Peter.PROM straght.SEQ go-**III**
dhutnha nhinan walala-ŋgal.
sit.SEQ sit.**III** 3p-OBL

'They were stoking the fire in order to dry each other off. Then Peter came straight in, he sat down with them.'

(227) **Continuous reading with *ga* IPFV.I**

... *bili ŋuriŋiyiny ga maŋutji-lakaram ŋunhi God-Waŋarrwuny*
because ENDO.ERG.ANA.PROM IPFV.**I** eye-tell.**I** ENDO God-holy.PROM
djeŋarra'mirrnydja Birrimbirr ga nhina-n nhokala.
bright.PROP.PROM spirit IPFV.**I** sit-SEQ 2S.OBL

'...because that shows ([??]is showing) that the bright spirit of God rests ([??]is resting) on you.' [*1 Betawuŋ Dhäwu*/1Pet 4:14]

(228) **A l̲atjin example from MW (648)**

wiripu+ny balanda mala marŋgi+mirr l̲atjin+gu l̲uka+nhara+w,
certain+PROM white person PL know+PROP mangrove
ga wiripu+ny mala bäyŋu l̲urrkun' marŋgi+ny l̲uka+nhara+w,
worm+DAT eat+4th+DAT and certain+PROM PL NEGQ
ga djäl+nydja l̲uka+nhara+w ga dharrwa+ny bäyŋu
few/three know+PROM eat+4th+DAT and want+PROM

'There are some white people who know about eating mangrove worms and others that do not. A few have eaten (them) and like eating (them) but many don't.'

5.1.3 Talking about the past

Perhaps the most important distinction between **I** and **III** is that events that are predicated as **including the time of speech** ($t*$) are felicitious only with **I**, modulo the caveats about post-state predication discussed above.)

At the beginning of this section (in addition to various points in Chapter 4), we that past temporal reference for W. Dhuwal(a) eventive predicates can b e established with either **I** or **III** inflection. This is clearly demonstrated again by the conjoined sentences in (229) below.

(229) **Past reference with I and III (conjunction)**

a. [*ŋarra* *l̪uk-**a*** *mänha* *barpuru*] *ga* [*ŋarra* *l̪uk-**ana*** *mänha* *dhiyaŋu*
1s drink-**I** water yesterday and 1s drink-**III** water PROX.ERG
bili]
CPLV

'I drank water yesterday and I drank water just before (earlier today).'
[BM 20190405]

b. *ŋarra* *barpuru* *munhagu* *ŋarra* ***l̪uka*** *djinydjalma* *ga* ***raŋunhaŋala***
1s yesterday night 1s eat.**I** crab and return-**III**
bäpawa *märr* *ŋayi* *dhu* ***l̪uka*** *dhiyaŋu* *bala* *goḏarrmirri*
father-DAT so 3s FUT eat PROX.ERG MVTAWY morning

'I ate some crab last night and this morning brought some back for Dad so that he can eat (some).' [BM 20190416]

Ultimately, we can think of the temporal interval (i.e. range of possible times) that are made available by each inflection can be described as follows (this is schematised in Figure 5.4 below.)

I $\tau(e)\circ$ **[**RECENT PAST **,** END.day-of-speech**)**

III $\tau(e)\circ$ **(**REMOTE PAST **,** time-of speech**]**

Below, we consider various options for theorising the distributional differences between (and meaning contribution of) **I** and **III**.

5.1.3.1 I as a present tense marker

Given that: • **I** is most clearly distinguished from **III** by its compatibility with present temporal reference, and also that • cognates of **I** in closely related Yolŋu varieties clearly realise present tense (see Chapter 6), a possible model of the distribution of **I** and **III**, then, analyse **I** a PRESENT-tense marker.

Of course, a semantics where the semantic contribution of **I** restricts the event to overlap with speech-time is untenable in view of **I**'s compatibility with past-reference. Consequently, an analysis of **I**-as-PRESENT would need to invoke the notion of an EXTENDED NOW (XNOW, *sc.* "a time interval reaching back from the time of utterance" (Cover 2010:49)).[8] A consequence of an analysis of this type would be that, past-referring utterances with **I**-morphology must be understood "not [as locating] a situation at some definite point in the past, but only to offer it as relevant to the current situation", a semantic domain traditionally associated with the ANTERIOR or PERFECT aspect (Bybee et al. 1994:62, underlining added).

Appeal to the notion XNOW has been deployed in a number of influential accounts of the English present perfect (notably McCoard 1978, Portner 2003 a.o.) to explain both • intuitions about the 'current relevance' of present perfect predications and, importantly • "the present perfect puzzle" (see Klein 1992, Schaden 2009), *sc.* the incompatibility of the present perfect with TFAs for the past (e.g. **I have eaten a few hours ago.*)

[8]Note that this definition of XNOW differs from (i.e. is a subset of) that which is formalised in Stump 1985:225, for whom it is a relation between *any* arbitary interval i such that $\text{XNOW}(i) = \{i' \mid i' \underset{\text{final}}{\sqsupseteq} i\}$.

Of course, as we have seen, this reasoning fails to account for the WD data. **I**, in fact, frequently co-occurs with TFAs for the past (e.g. *barpuru* 'yesterday', which does *not* cooccur with **III** in these varieties.) This is shown again in (230):

(230) Interactions between **I** and **III** and recent past-denoting TFA *barpuru*

a. *d̲irramuwal yothuwal bäpa'mirriŋuy rrupiya barpuru* ***djuy'yu-n***, ***märr***
man.OBL child.OBL father.PROP.ERG money yesterday send-**I** kinda
barpuru
yesterday

ga ***barpuru*** ***buna****-ny* *dhiyal-nydja.*
and yesterday arrive.**I**-PROM PROX.LOC-PROM

'The father sent money to the boy recently and it arrived here yesterday.'
(Wilkinson 2012:343)

b. *ŋarra ga-na* ***l̲uka-na*** *barpuru*
1S IPFV-**III** consume-**III** yesterday

INTENDED. 'I was drinking water yesterday.' [DhG 20190405]

Given that TFAs for the past ought to be compatible with past-tense marking and incompatible present-tense marking, the PRES/PST analysis of these inflectional categories makes false predictions of infelicity with **I** (230a) and felicity with **III** (230b). On the basis of this data we can dismiss a treatment that treats **I** as PRES-denoting and accounts for the *recent past* uses as emerging out of a PERFECT/ANTERIOR reading of the present.

Relatedly, the relationship between (erstwhile) present perfect constructions and past temporal reference. in Peninsular Spanish varieties, "perfective uses of the [present] perfect are restricted to certain temporal contexts, such as describing events that happened during the 'today' or 'yesterday' intervals... [whereas the *préterito* is] found in virtually any type of context when past reference is made" (Howe 2006:72, also Curell i Gotor 1990:115ff for Catalan.) This is argued to be an instantiation of a grammaticalisation pathway where the distribution of a particular grammatical marker acquires PERFECT meaning before further developing into a PERFECTIVE or PAST tense operator.[9] This phenomenon and its relevance for an analysis of the Yolŋu data presented here is treated below (§ 5.1.3.2).

5.1.3.2 Disjunctive presuppositions

A consequence of these data for theories of tense is that, if we assume an "off-the-shelf" account of tense marking as encoding a presupposition about the relation between a contextually-provided reference time and the time of speech, we are left with the disjunctive presuppositions in (231).

(231) **A polysemy treatment of the temporal contribution of I and III**

a. $[\![\textbf{I}]\!]^c = \lambda t : \begin{cases} t \in today \leftrightarrow t \circ t_0 & .\, t \quad \text{[NONPAST]} \\ t \notin today \leftrightarrow t \prec t_0 \wedge \mu(t, t_0) < s_c & .\, t \quad \text{[RECENT PAST]} \end{cases}$

[9] The "pathway" PERF → PFV has been referred to as the "Aoristic drift" (Schaden 2009, 2012). See (Schwenter 1994) for the Alicante variety of Peninsular Spanish, (Condoravdi and Deo 2014) for the instantiation of this pathway in Indo-Aryan.

I enforces a presupposition that: the reference time t coincides with speechtime t_0, **OR**
if t does NOT fall within the interval '$today$', then the temporal distance by which t precedes t_0 is ***below*** *some contextually provided standard* s_c

b. $[\![\textbf{III}]\!]^c = \lambda t : \begin{cases} t \in today \leftrightarrow t \prec t_0 & .\, t \quad \text{[TODAY PAST]} \\ t \notin today \leftrightarrow t \prec t_0 \wedge \mu(t, t_0) > s_c & .\, t \quad \text{[REMOTE PAST]} \end{cases}$

III enforces a presupposition that: for a reference time t that falls within the interval '$today$', then it precedes speechtime t_0, **OR**
if t does NOT fall within the interval '$today$', then the temporal distance by which t precedes t_0 is ***above*** *some contextually provided standard* s_c

In effect, the "disjunctive presupposition" account captures the descriptive facts of the "cyclic" tense systems that characterise western Arnhem languages and the TENSE-FRAME interactions of Glasgow 1964 *et seq.* (see 4.3) It treats each of **I** and **III** as having two possible denotations which are adjudicated by the contextual retrieval of a topic time t and a process of "checking" whether t falls within a privileged interval, *viz. today* (DAY-OF-SPEECH).

As described above, typologically, there appears to be evidence in favour of a DAY-OF-SPEECH interval with linguistic consequences. For example, for a number of Romance languages, "present perfect" constructions have generalised into simple PERFECTIVE or PAST tense markers (the so-called "Aoristic drift" cf. Schaden 2012). In an ostensible transition stage, the use of the present perfect with past temporal reference is restricted to the day of speech (*hodiernal* temporal reference; Comrie 1985, Dahl 1985). This phenomenon is shown for Alicante Spanish in (232) below where, according to Schwenter (1994), there are very few recorded utterances of the type given in (b), particularly among younger speakers.[10] Schwenter's data points to the loss of a grammaticalised PERFECT, the two past tenses now rather encoding differential temporal remoteness (*sc.* metricality.)

(232) **In Alicante Spanish, the (erstwhile) present perfect assumes a PFV reading (restricted to same day utterances)**

a. *Hoy me he levantado a las siete*
today me have.1s arisen at the seven

'Today I have got up at 7 o'clock.'

b.*% *Hoy me levanté a las siete*
today me arose.3s at the seven

'Today I got up at 7 o'clock.' (Schwenter 1994:91)

As mentioned above, two major issues for an analysis of temporal reference in this language are METRICALITY and CYCLICITY. These will be treated in turn.

5.1.3.3 Metricality (temporal remoteness) in the past

In the past number of years, formal semanticists have paid attention to the tense systems of languages that appear to subdivide the PAST and FUTURE tenses according to (perceived)

[10] As suggested above, a similar distinction appears to be drawn in Catalan according to Curell i Gotor (1990). This may point to an areal diffusion of the innovation/grammaticalisation of perfective/hodiernal past readings of the perfect construction through the *Països Catalans.*

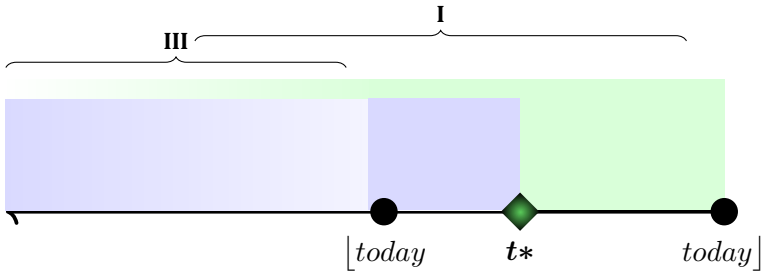
remoteness from speech time (e.g. Cable 2013, Klecha and Bochnak 2016 in addition to Bohnemeyer 2018 on 'temporal remoteness marking in [Yucatec Maya, yua] a tenseless language').

For Cable (2013), Gikũyũ's system of 'temporal remoteness morphemes' (4 for the past, 2 for the future) constrain the event (instantiation) time of the predicate they modify. Cable's TRMs are analysed as identity functions over sets of events that enforce a presupposition of temporal remoteness (233).

(233) $[\![\text{CUR}]\!]^{g,t*} = \lambda e : \tau(e) \propto$ day surrounding $t* . e$
CUR denotes an identity function on events, one whose domain is restricted to events whose runtime $\tau(e)$ overlaps with the day surrounding the utterance time $t*$ (Cable 2013:253)

Similarly, Cable's IMM 'immediate past' and NRPST 'near past' make presuppositions that the runtime of the described event overlaps with intervals related to $t*$ (IMPST and REC : $\mathcal{I} \to \mathcal{I}$ respectively).

Figure 5.4. W. Dhuwal(a) predicates inflected with **I** and **III** make overlapping reference intervals available. They are both felicitous with past predications.



The contrast between the two sentences in (234) excerpts from Wilkinson (2012:343) provide interesting insights about the subjectivity and context-dependence of temporal remoteness.

(234) **LAST YEAR temporal frames licensing I and III**

a. *way marŋgi nhe ŋarra-kalaŋa-w bäpa-'mirriŋu-w-nydja ŋunhi ŋayi*
hey know 2s 1s-OBL-DAT father-PROP-DAT-PROM ENDO 3s
*dhiŋga-**ma**-ny ŋuriŋi bala dhuŋgarra-y*
die-**I**-PROM ENDO.ERG MVTAWY year-ERG

'Hey, did you know my father who died last year?'

b. *nhä nhokiyin-gal wäwa-'mirriŋu-y warkthu-**rr** ŋäthil rarranhdharr-yu*
what 2s.EMPH-OBL brother-PROP-ERG work-**III** before summer-ERG

'What did your brother do last summer?' (Wilkinson 2012:343)

(235) **CONTEXT.** Wamut has been living in Sydney for a long time. Visiting Ramingining, he's speaking to his *gathu* about *l̪atjin*.

a. last week, *baman'nha ŋarra nhä-**ma** l̪atjin bili ŋarra ga-**n** barrku*
prior-SEQ 1s see-**I** *teredo* because 1s IPFV-**III** far
*nhina-**n**.*
sit-**III**

'Last week I saw *l̪atjin*, I had been living far away.'

b. *ŋäthil/baman' ŋarra ga-**l** nhä-**ŋal***
previously 1s IPFV-**III** see-**III**

'I saw one long ago.'

c. *nhä-**nha** yan ŋarra li ganha ŋunhi ŋarra yothu yan*
see-**IV** just 1s HAB IPFV-**IV** ENDO 1s child just

'I used to see them when I was a kid.' [AW 20190422]

5.1.3.4 A MAXPRESUPP account

Previous descriptions have seized on the demonstrably broad distribution of **I** to assign it metalinguistic labels including BASE and NEUTRAL (these were summarised in 4.2). Drawing on this, I propose a lexical entry for the meaning contribution of **I** and **III**, which draws on principles of pragmatic blocking in order to derive the distribution exhibited in WD.

In their 2014 interval-semantic treatment of the Indo-Aryan PERFECT, Condoravdi and Deo develop a set of formal tools for relating a property (formally a set of eventualities or times) to a reference interval. As shown in (236), for predicates of eventualities, $\textsc{Inst}(P, i)$ holds whenever the runtime of a P-event is contained within i.

(236) **Property instantiation** (Condoravdi and Deo 2014:278)

$$\textsc{Inst}(P,i) = \begin{cases} \exists e[(P(e) \wedge \tau(e) \sqsubseteq i] & \leftarrow P \subseteq \mathcal{E} \\ P(i) & \leftarrow P \subseteq \mathcal{T}^{11} \end{cases}$$

A maximally underspecified lexical entry for **I** is given in (237) below. Here, **I** is taken simply to realise an INST relation between its prejacent (a predicate of events $P_{\langle \varepsilon_e, t\rangle}$) and a contextually given reference interval (i). It notably makes no restrictions on the nature of the relation between i and utterance time $i*$. This is motivated by the data shown above, where **I** is felicitous with PAST, PRESENT and FUTURE reference (modulo a number of distributional restrictions).

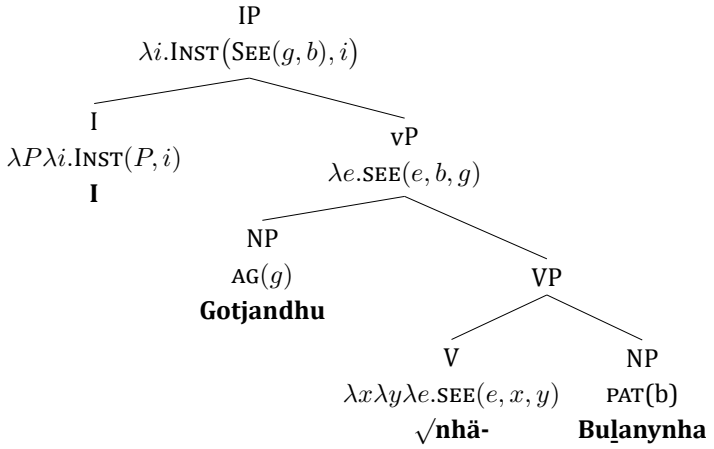
(237) **A first attempt at a general denotation for the FIRST inflection** $[\![\textbf{I}]\!]^{g,c} = \lambda P \lambda i.\textsc{Inst}(P, i)$

here is i going to be epresented in the obj lang?

A derivation for a transitive **I**-sentence is given in (238). This sentence is incompatible with present reference given the constraints described in the previous section: namely that *nhäma* 'see' denotes an property of events. Seeing as eventive properties are inherently bounded, they are incompatible with present reference. The event time can be further constrained by past-denoting TFAs (e.g. *barpuru* 'yesterday')

(238) *Gotjan-dhu nhäma Bu̲lany-nha*
MÄLK-ERG see.**I** *MÄLK*-ACC

'Gotjan saw Bu̲lany.'



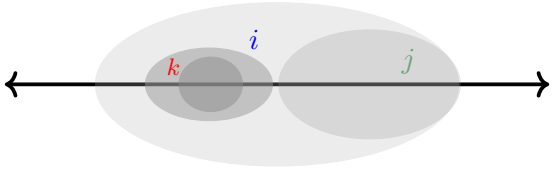
[11] Consequently, for predicates of times the equivalence $\textsc{Inst}(t, p) \leftrightarrow \textbf{AT}(t, p)$ holds (a 2-place **AT** relation familiar since Dowty 1979 *et seq.*) Note however that for Deo (2006:68,78), AT⊆INST

Of course, as shown, **I** is incompatible with both TODAY PAST and REMOTE PAST situations. I model this incompatibility as emerging from a blocking effect associated with the relative assertoric strength of **III** (which is a *bona fide* past tense albeit with additional use restrictions.) NONFINAL INSTANTIATION is a subcase of the PROPERTY INSTANTIATION relation which holds only if the P-event **does not overlap** with the end of the reference interval i.

(239) **Non-final instantiation** (Condoravdi and Deo 2014:279)

a. Defined iff $j \underset{\text{FINAL}}{\sqsubset} i$;

$$\text{NFINST}(P, i, j) \leftrightarrow \exists k(\text{INST}(P, k) \wedge k \sqsubseteq i \wedge k \prec j)$$



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.

aybe this doesn't work? It ught to come out as false if ere is an event of P type at occurs as a final ubinterval... as long as instantiation doesn't ROPERLY occur in a final ubinterval maybe **e. does this predict (for e? for C&D?) that *i have aten before and i'm eating ow* ought to be bad?**

Armed with these two relations, we can stipulate that WD makes available two possible candidates for the "reference interval" i_c : namely *today* and *before today*. This permits for a treatment of **III** as predicating a NONFINAL INSTANTIATION relation between a property and one of these two reference intervals. This is given in (240).

(240) **A first attempt at a lexical entry for the THIRD inflection**

$[\![\textbf{III}]\!]^{g,c} = \lambda P \lambda i_c . \exists j [j \underset{\text{FINAL}}{\sqsubseteq} i_c \wedge \text{NFINST}(P, i_c, j)]$

The THIRD inflection asserts that, for i, there is a final subinterval j and P is instantiated at some subinterval of i that wholly precedes j (i.e. that NFINST(P, i_c, j) holds.)

40 ***is*** just the denotation r PERF for C&D though

Having stipulated that i_c is saturated by either *today* or *before today*, NFINST makes salient two sets of intervals which correspond to the CONTEMPORARY/PRECONTEMPORARY distinction described for the inflectional systems of the Maningrida languages (Eather 2011, Glasgow 1964, Green 1995). CONTEMPORARY eventualities are those that are situated in a FINAL subinterval of the reference interval $\{j \mid j \underset{\text{FINAL}}{\sqsubseteq} i\}$. PRECONTEMPORARY eventualies are situated in a NONFINAL subinterval of i_c, i.e. $\{k \mid k \underset{\text{NONFIN}}{\sqsubset} i_c\}$. These intervals are summarised in Table 5.2 below.

Table 5.2. Instantiation intervals j, k made available by different flavours of i_c

INTERVAL TYPE		TODAY frame	FORE-TODAY frame
reference	$\boldsymbol{i_c}$	$(\textbf{\textit{today}}, i*]$	$(\_, \textbf{\textit{today}}]$
CONTEMPORARY	$\boldsymbol{j} \underset{\text{FINAL}}{\sqsubseteq} i_c$	*dhiyaŋ bala* 'now'	*barpuru* 'recently'
PRECONTEMPORARY	$\boldsymbol{k} \underset{\text{NONFIN}}{\sqsubset} i_c$	*dhiyaŋ bili* 'now'	*baman'* 'previously'

As shown above the semantic contribution of **III** is taken to situate the runtime of an event in a non-final interval of i_c. The consequences of this treatment for each of these temporal frames are explicated below.

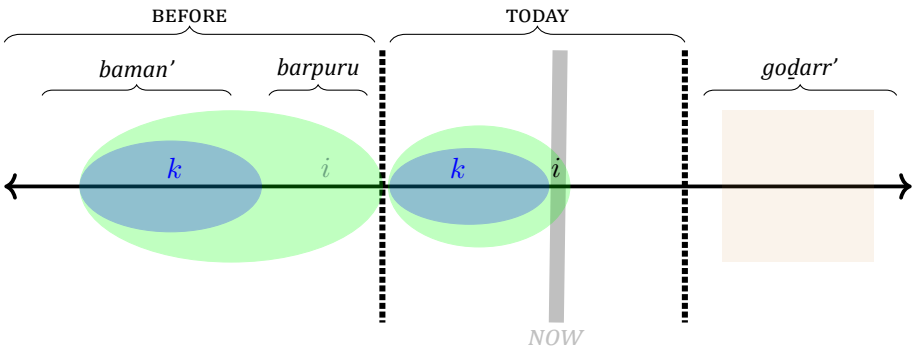
can prove this as a theorem
f $\mathcal{L}$ if necessary but it's
retty intuitive right?

The TODAY frame Any arbitrary final subinterval j of $(today, i*)$ necessarily overlaps with speech time.[12] From this, we can simply derive the incompatibility of **III** with PRESENT-referring event descriptions: all non-final subintervals of $(today, i*]$ forcibly exclude $i*$. As a result, NFINST$(P, [today, i*), j)$ yields the TODAY PAST distribution for **III**.

The NONTODAY frame Further, the "subjective" nature of the RECENT V. REMOTE distinction (shown in §5.1.3.3) also falls out of this treatment. In principle, given that the BEFORE-TODAY frame has no left boundary, NFINST makes available any subinterval of i_c that does not include its right edge. As a result, the duration of final subinterval j is contextually determined, presumably adjudicated by what the Speaker considers to count as CONTEMPORARY in a given discourse context.

The infelicity of **III** with a class of temporal frame adverbials, most clearly *barpuru, yawungu* 'yesterday' and points to a conventionalised principle of "minimum duration" for j in these contexts. While these adverbials are glossed as 'yesterday', it can be demonstrated that they are compatible with a wider range of RECENT PAST interpretations. This was discussed in §4.6.2 above. See also the variable interpretations of *barpuru* (and its composition with *märr* 'somewhat' in ex. 230 above).

Figure 5.5. Appealing to 'nonfinal instantiation' to provide a unified entry for the temporal reference of **III**



The infelicity of **I**-inflected predicates with REMOTE and TODAY PAST instantiation times then emerges as a result of pragmatic blocking. It is well demonstrated that oppositions between specific and general meanings give rise to a division of pragmatic labour in which the general form is conventionally restricted to the complement of the domain of the specific form (Deo 2015a, citing Horn 1984 & Horn and Abbott 2012).

Given that $[\![\mathbf{I}]\!] \supsetneq [\![\mathbf{III}]\!]$,[13] a scalar implicature $\langle \mathbf{I}, \mathbf{III} \rangle$ obtains between these two inflections.

That is, a sentence of the form $\mathbf{I}(\varphi)$ conventionally implicates $\neg\big(\mathbf{III}(\varphi)\big)$. As a consequence, while the lexical entry for **I** provided in (237) provides for the property instanti-

[12] $j \underset{\text{FINAL}}{\sqsubseteq} (\text{today}, i*] \leftrightarrow j \circ i*$
Simply, all final subintervals of the interval $(\text{today}, i*]$ contain $i*$ (by def $\underset{\text{FINAL}}{\sqsubseteq}$)

[13] Given that INST is a relation between a property P and interval i, whereas NFINST is a relation between a property P and a proper subinterval of i, NFINST $\subsetneq$ INST.

$$\text{NFINST}(P, i, j) = \text{INST}\big(P, \underset{\text{NFIN}}{\sqsubset} (i)\big)$$

$$\therefore \quad \text{INST}(P, i) \supsetneq \text{INST}\big(P, \underset{\text{NFIN}}{\sqsubset} (i)\big)$$

ation in *any* subinterval of i_c, in competition with the truth-conditionally stronger **III**, its distribution is restricted to FINAL SUBINTERVALS of i_c (i.e. those green areas $(i-k)$ in Figure 5.5 above). The blocking of **I**'s realisation of the NONFINAL INSTANTIATION relation by **III** is derived in (241) below.

(241) **Pragmatic strengthening of I**

$$\llbracket \mathbf{I} \rrbracket(P)(i_c) \rightsquigarrow \textsc{Inst}(P, i_c) \setminus \llbracket \mathbf{III} \rrbracket \quad \text{(i)}$$

$$\rightsquigarrow \textsc{Inst}(P, i_c) \setminus \exists j \underset{\text{FIN}}{\sqsubset} i_c \wedge \exists k \big[\textsc{Inst}(P, k) \wedge k \sqsubseteq i_c \wedge k \prec j\big] \quad \text{(ii)}$$

$$\rightsquigarrow \exists j \big[j \underset{\text{FIN}}{\sqsubseteq} i_c \wedge \textsc{Inst}(P, i_c) \wedge \nexists k[k \sqsubset i_c \wedge k \prec j \wedge \textsc{Inst}(P, k)]\big] \quad \text{(iii)}$$

$$\rightsquigarrow \exists j \big[j \underset{\text{FIN}}{\sqsubseteq} i \wedge \forall k[k \sqsubset i_c \wedge k \prec j \rightarrow \textsc{Inst}(P, \{i_c - k\})]\big] \quad \text{(iv)}$$

$$\rightsquigarrow \exists j \big[j \underset{\text{FIN}}{\sqsubseteq} i \wedge \textsc{Inst}(P, j)\big] \quad \text{(v)}$$

I realises property instantiation but, via competition with the more specific form–**III**–its use is conventionally restricted to the relative complement of **III**'s domain ***(i)***. That is, the relative complement of NONFINAL INSTANTIATION ***(ii)***. Therefore **I** is felicitously uttered when there is no subinterval k that wholly precedes the final subinterval j at which P is instantiated ***(iii)***. **I** is therefore felicitous when predicating instantiation of P at the complement of i relative to any its nonfinal subintervals k—sc $i - k$ ***(iv)***. Consequently, **I** is felicitous when predicating instantiation of some property P only at a **final subinterval** $(i - k = \boldsymbol{j})$ of the reference interval ***(v)***.

Given the blocking and strengthening effects described here, **I** and **III** are in complementary distribution. Where **III** realises NONFINAL INSTANTIATION (the domain of the 'Precontemporary' tense), **I** realises FINAL INSTANTIATION (the domain of the 'Contemporary', cf. Table 5.2 above.) The discontinuous timespans that license the use of **I** are spelled out below.

The TODAY frame

The NONTODAY frame

5.1.4

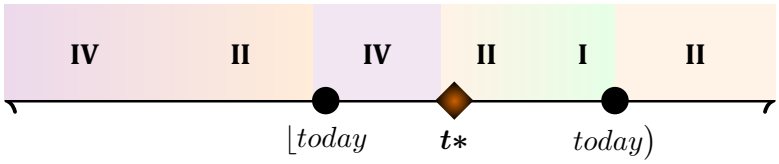
$\llbracket \textsc{woll} \rrbracket = \lambda P \lambda w \lambda t. \forall w' \big[w \in \mathbf{MB}(w, t) \rightarrow \textsc{at}\big([t, \_), w, P\big)\big]$

- Unlike Cleo's WOLL here there's prob no way of getting away from relativising this to an ordering source

5.2 Mood, reality status & the speech act

think the presence of **I** here probably just noise: peaker variation w/r/t ensitivity to the negation ffect. To be confirmed. **pdate:** it isn't noise.

Figure 5.6. Apparent interactions between temporal relations and reality status in Djambarrpuyŋu: cyclicty and metricality under negation.



(242) **Present under negation**

a. *Ŋarra gi bäyŋu maḻŋ'maraŋu waṯu (ŋarraku). Bili ŋayi ga nhina*
1s IPFV.II NEG appear.CAUS-**II** dog 1s.DAT CPLV 3s IPFV sit.**I**
wäŋaŋura
house.LOC

'I can't find my dog. It lives in the house.' [DhG 20190417]

(243) **Same day past under negation**

a. **CONTEXT. I'm at work explaining to my coworker why my *galay* is angry at me.**

Ŋarraku miyalk maḏakarritj-thi-na bili ŋayi ga guyaŋa ŋarra ganha
1s.DAT wife anger-INCH-**III** CPLV 3s IPFV.**I** think.**I**[15] 1s IPFV.**IV**
bäyŋu djäma
NEG work

'My wife got angry because she thought I wasn't working today.'

(244) **Yesterday past under negation**

a. *Ŋarra gana djäl-thi-na girritjirrinyarawu buŋguḻgu, yurru*
1s IPFV.**III** want-VBLZR-**III** dance-NMLZR-DAT *buŋguḻ*-DAT but
barpuru ŋarra yaŋara' bakthun/ḏaw'yun, bala, bäyŋu ŋarra
yesterday 1s leg hurt-**I** MVTAWY NEG 1s
girritji
dance-**II**

'I wanted to go to the *buŋguḻ* but yesterday I hurt my leg. Now I can't dance.'

b. *Ŋarra ga djälthirri giritjirrinyarawu, yurru ŋarra bäyŋunha*
1s IPFV.**I** want-VBLZR-**I** dance-NMLZR-DAT and 1s NEG-SEQ
girritji
dance-**II**

'I was wanting to dance (at the *buŋguḻ* yesterday) but I didn't dance (because I hurt my leg yesterday.)' [DhG 20190417]

[15] *ŋayi guyaŋan* 'she thought' (PST PFV) also fine.

(245) **Remote past under negation**

a. *Ŋunhi ŋarra buna-na Ramingiṉiŋ, ŋarra ga-nha yaka djäl-thi-nya*
ENDO 1S arrive-**III** PLACE 1S IPFV-**IV** NEG want-VBLZR-**IV**
l̪atjin'gu. dhiyaŋu-nydja bala, ŋarra ga djäl-thi-rri l̪atjin'gu
teredo.DAT PROX.DAT MVTAWY 1S IPFV.**I** want-VBLZR-**I** *teredo*.DAT

'When I arrived in Ramingining, I didn't like *l̪atjin*. *Now* I like them.'
[Daphne? DhG20190417]

b. *bäyŋu ŋarra ŋuli ganha nhänha (waltjaṉ) ŋunhi ŋarra yothu yän*
NEG 1S HAB IPFV see.**IV** rain ENDO 1S child just

'When I was young, I hadn't seen rain/never saw rain.'

(246) **Wallaby sentences**

a. $\boldsymbol{t_{see} \succ t_{eat}}$

gäthur ŋarra ***nhäŋal*** *ŋunhi bili weṯi ŋunhi barpuru ŋarra* ***nhäma****,*
today 1s see.**III** ENDO CPLV wallaby ENDO yesterday 1s see.**I**
l̪uka ga *mulmu*
eat.**I** IPFV.**I** grass

'Today I saw the same wallaby that I saw yesterday eating grass.'
[AW 20190412]

b. $t_{see} \prec t_{eat}$

dhiyaŋ bili ŋarra nhäŋal ŋunhi bili weṯi l̪uka ga mulmu
PROX.ERG CPLV 1s see.**III** ENDO CPLV wallaby eat.**I** IPFV.**I** grass
(dhiyaŋ bala)
PROX.ERG MVTAWY

'(This morning) I saw the wallaby that's eating at the moment.'

c. $\boldsymbol{t_{see} \circ t_{eat}}$

dhiyaŋ bili ŋarra nhäŋal weṯi l̪ukan gan (mulmu)
PROX.ERG CPLV 1s see.**III** wallaby eat.**III** IPFV.**III** grass

'I just saw a wallaby (that was) eating (grass).' [AW 20190412]

Chapter 6

Variation, change & 'design principles'

6.0.1 Yan-nhaŋu & Golpa

KL describes guf as a "modality-based language" (176) against which she contrasts Golpa: 'There are several (more and less strong) arguments against a modality-based analysis of the Golpa verb system' (Kabisch-Lindenlaub 2017:179ff)

KL ex 365,55,77 — reanalysis of III by Golpa speakers as a general past marker? (Cf. Yannhaŋu), see pg 209ff (table 26), 159ff for forms (Table 15ff). No negation efffects ex 28, 119

(247) **Recent past receiving PAST (cog. III) marking in Golpa**

a. *Yawungu ŋarra bath-**ana***
yesterday 1s cook-**PST**

'Yesterday I cooked' (Kabisch-Lindenlaub 2017:100)

b. *Ŋarra-ŋayu ma ŋurru-**nha** djulŋi-yu-**nha** barpuru*
1s-PROM IPFV sleep-**PST** good-INCH-**PST** yesterday

'I was sleeping well yesterday.' (ibid.)

(248) **Future reference receiving NEUTRAL (cog. *I*) marking in Golpa**

*Nhaŋu ŋarra-ŋayu wurruku djinidhal gara-**ma** ga baŋu-ŋayu duy'tj-un*
PROX 1s-PROM FUT now go-**NEU** and here-PROM return-**NEUT**
munhamurru godarr'
tomorrow morning

'I'll leave now and come back here tomorrow morning.' (*ibid.*)

6.0.2 Wangurri (Dhaŋu-Djaŋu)

Mally's thesis came out almost the same time as Mel's (there're signs that they were speaking/comparing also and they were both at Sydney universities): a big point of difference which is likely the language (rather than the linguist) is that Mally describes the cognate

to **III** as the **PFV** and **doesn't report cyclicity.** She *does* argue for a very mood-central conception of the verbal paradigm. My inclination is that this has some intersections with the evidential status and more accurately the **illocutionary force** of an utterance given its inflectional status.

- Mally notes that the mood-based neutralisation described of Dhuwal doesn't obtain in Wangurri. Here all (5) inflections can occur under negation. It is however possible that there is some variation along this parameter (see McLellan's ex. 34)

(249) Cooccurrence of NEG and **III** in Wangurri

Ŋarru	***ŋangawal***	*nhän*	*banha*	*banha-ya*	*bäpi-m*	*waŋa-yi-**na**-m*
But	NEG	3s	that	that-ANA	snake-d	die-INCH-**III**-d

'But that snake did not die.' (McLellan 1992:178)

- It's not actually clear to me that there isn't some sort of metricality/cyclicty between cognates of **I** (her 1/NEU) and **III** (her 2/PFV).

(250) a. *ŋangawul-nha nhän barpuru gayŋa ŋuwaly-man-ma ŋarra*
NEG-PROM 3s yesterday IPFV.**I** well:CAUS-**I**-PROM go.**I**

'He kept not being well yesterday.' (McLellan 1992:196)

b. *waŋgany-dhu barpuru ŋanapiliny nhawun guŋnharru-ma-n-a*
one-ERG yesterday 1p.EXCL.ACC DP separate-CAUSO**I**-PROM?

'One left us yesterday.' (McLellan 1992:250)

  - Another problem with this is the IPFV auxiliary cooccurs with all inflections: *gayŋa.**I**, gayŋi.**II**, gayŋan.**III**, gayŋarra.**IV***

- Nice examples of remote past **III** in the *Israel Text* (pg. 263-4)

- Possibly only one circumstantial modal *ŋarru* that conflates the functions of *dhu* and *balaŋu*. Note that *ŋarru* is also glossed as 'but' in 250. This means it is almost certainly cognate with *yurru*: the Miwatj FUT. (And in fact, *dhu* is also almost certainly a grammaticalisation of this.)

- **NB** – the HAB form described by McLellan is *bayiŋ*. This is the ERG-inflection of the demonstrative *banha* (hence ***bayiŋu***). This has maybe be whence *balaŋu* or *bäyŋu* in Dhuwal? (184)
bilaŋ garri/bayin warri could also be source constructions for balaŋu?? (see 214)

- *bayiŋ* 'HAB' also has some circ modal uses., see pg. 256: *nhunu bayiŋ ŋarray* 'You should come'

- *wilak=mak*, *bitjan l̲inygu, yäna, l̲inygu/bili* (197)

- *Bili, tout court* is used to end stories. I"m just convinced that this is an illocutionary force marker. An instruction to upload to the cg.
- p248,9 gives examples (, 16) of **I** receiving future reference.

6.0.3 Wuḻaki & Djinaŋ

Waters focuses his work on juwiŋ Djinaŋ. I have access to Ganalbingu speakers which could help to fill some of the big gaps in his data on his language. Additional judgments from Yirritjiŋ Djinaŋ are also available via the Wuḻaki men and Margaret hopefully.

Djinaŋ-Djinba look to have floresced a little in verbal inflectional domain. There seems to be solid attested cyclicity/metricality in the djr/guf style and then a bit of extra stuff. Unsure what happens under negation.

6.0.4 Ganalbingu (Djinba)

6.0.5 Ritharrŋu

A likely close relative of Dhuwal-Dhuwala, Ritharrŋu – the southernmost Yolŋu variety – is described by Heath as having 'basic...semantically straightforward' PAST, PRESENT and FUTURE tense categories (1980a:74).

(251) **Ritharrŋu FUTURE (cog. II) licensed in complements of propositional attitudes**

a. *djäl-thirri nhanŋu rra ḻan-**ŋu** nya rra*
want-INCH.PRES 3S.DAT 1s spear-FUT 3S.ACC 1s

'I want to spear him' (Heath 1980a:105)

b. *marŋgi nhe **waŋi** nhe ritharrŋu-ŋuru'*
know 2s speak.FUT 2s Ritharrŋu-ABL

'You know how to speak Ritharrŋu.' (Heath 1980a:105)

(252) **Relative temporal ordering?**
guyupa-na-thaŋ' ŋay ḏul'-maṉ ḏali
die-PST-TEMP 3s burn-CAUS.PRES 3p

'When someone dies, they burn [grass].' (Heath 1980a:97)

6.0.5.1 Data from Salome's elicitation

Two elicitation sessions led by Salome Harris, May 2019 in Ngukurr on the basis of my TMA questionnaire which she translated into Kriol with Anthony Daniels (i have a copy of their translation in an email from S'lomes on 20 May 19). My transcriptions (for RNPW) were checked (and corrected extensively) by her. At least one recording (RNPW) is archived w AIATSIS already

- Roy Natilma & Peter (Djudja) Wilfred [20190520 RNPW]
- Andy Lukuman (wäg) & David Wilfred (rit) [20190522 ALDW]

(253) **Present (progressive)**

a. *nhäma-nu ŋarra mukul'nha-ya yaŋun'thu-ya bala*
see.**I**-SEQ 1S aunt.ACC-PROM PROX-ERG-PROM MVTAWY

'I'm looking at my aunt right now.' [RN 20190520]

b. *nhäma-'ŋirri' ŋarra mukul'nha-ya*
see.**I**-*only* 1S aunt.ACC-PROM

'I'm looking at my aunt right now.' [AL 20190522 57s]

(254) **Present (habitual)**

a. *gu̱lku'mirri ŋarra nhäma mukulŋ'nha-y*
frequent-PROP 1S see.**I** aunt.1S.ACC-PROM

'I see my aunt frequently (every day).' [RN 20190520]

b. *nhäma-'ŋirri' ŋarra mukul'nha-ya (muŋuy')*
see.**I**-*only* 1S aunt.ACC-PROM always

'I see my aunt all the time (every day).' [AL 20190522 1min30s]

c. *napu nya ŋuli bartjun-dja ŋuŋ'ŋara-dhi u̱ka-nu ŋay*
1P.EXCL 3S.ACC DIST|HAB? spear-PROM DIST.LOC-TEMP eat.**I**-SEQ 3S
ŋaŋ'gun-ŋu ŋay wurpan
bathe.**I**-COMP 3S emu

'We throw spears at it right there in the waterl; as it drinks, as it bathes, the emu.' (Heath 1978a:137)

(255) **future (same-day)**

a. *ripurru'mirri ŋarra nhäŋu mukulŋ'nha-ya*
afternoon 1S see.**II** aunt.1S.ACC-PROM

'I'll see my aunt this afternoon' [RN 20190520]

ripurru- can also mean 'yesterday'

(256) **future (tomorrow)**

a. *gu̱darrpuy ŋarra nhäŋu mukulŋ'nha-ya rraku*
tomorrow 1S see.**II** aunt.1S.ACC-PROM 1S.DAT

'I'll see my aunt tomorrow' [RN 20190520]

gu̱darr can also mean 'morning'

(257) **past (same-day)**

a. *gätha ŋarra nhäwala mukulŋ'nha-ya*
today 1S see.**III** aunt.1S.ACC-PROM

'I saw my aunt today (this morning.)' [RN 20190520]

(258) **past (yesterday)**

a. *ripurrumirri ŋarra nhäwala mukulŋ'nha-ya*
yesterday 1s see.**III** aunt.1s.ACC-PROM

'I saw my aunt today (this morning.)' [RN 20190520]

b. *nhäwala ŋarra mukul'ya gäthura-ya*
see.**III** 1s aunt-PROM yesterday-PROM

'I saw my aunt yesterday.' [DW 20190522 5min11s]

(259) **past (distant)**

a. *ŋarra yothu-ganyaŋ', nhänha ŋarra ŋuli mukulŋ'nha-ya*
1s child-DIM see.**IV** 1s HAB? aunt.1-PROM

'When I was a kid, long ago, I saw my aunt.' [RN 20190520]

b. *baman'dja nhäwala ŋarra mukulŋ'nhaya, yothu'thi-ya-ŋ*
before.PROM see.**III** 1s aunt.1-ACC-PROM yesterday-PROM

"When I was a kid, long ago, I saw my aunt.' [DW 20190522 6min17s]

(260) **past (habitual, distant)**

a. *ŋarra yothu-ganyaŋ', nhänha ŋarra ŋuli mukulŋ'nha-ya*
1s child-DIM see.**IV** 1s HAB? aunt.1-ACC-PROM

'When I was a kid, long ago, I saw my aunt.' [RN 20190520 2min15]

b. *nhänha'ŋirri ŋarra yaku'yu-na bili yothuganyaŋ'dhu-ya rra*
see.**IV** 1s thusly-**III** CPLV young.DIM-TEMP-PROM 1s

'When I was a kid I'd seem my aunt all the time.' [RN 20190520 2min25]

Heath doesn't report any *ŋuli* particle in Rit so far as i can tell, it's *possible* that this is a borrowing? In the other recording the habitual past elicitaiton also receives **III** marking though it's not clear that the meaning is totally understood (there's no temp freq adverbial, for example. Note that Heath notes that the difference between *wänina* and *wäninya*, two forms of 'go.PST' ('went') may differ in ±HABITUAL, pg. 75.) *Ŋuli is* the form distal demonstrative in Rith though (where in djr it's *ŋunhi*, although both *ŋuli* and *ŋunhi* seem to show up as a subordinator and HAB is only available with *nuli*.) We're in the presence of something here. Note that the subordinating enclitic in rit (also present in 254c) is =*ŋu*.

(261) **negative present**

a. *nhäma'may'-nu rra yaŋun'dhu-ya bala*
see.**I**-NEG-SEQ PROX-TEMP-PROM MVTAWY aunt.1ACC-PROM
mukulŋ'nha-ya

'I'm not looking at my aunty right now.' [RN 20190520 2min42]

b. AL translates this with **III** and a now-TFA (cf. my proposed lexical constraint on aktionsart for djr. verbs)

(262) **neg pres hab**

a. *yaka ŋarra nhäma'may' mukulŋ'nha-ya guḻku'-mirri-ya*
NEG 1s see.**I** aunt.1-ACC-PROM frequent-PROP-PROM

'I don't see my aunt every day.' [RN 20190520 2min54s]

(263) **neg fut sameday**

a. *yaka rra nhäŋu'may mukulŋ'nha-ya gäthura-ya*
NEG 1s see.**II**-NEG aunt.1-ACC-PROM today-PROM

'I won't see my aunty today.' [RN 20190520 3min3s]

b. *yakaŋu, mukul nhäŋu-'may' ŋarra; gäŋu nhe wäyindja*
NEGQ aunt see.**II**-NEG 1s get.**II** 2s meat-PROM

'No, I won't see aunty (today), you get the meat.' [DW 20190522 12min45s]

(264) **neg fut tomorrow**

a. *yaka ŋarra nhäŋu'may mukulŋ'nha-ya goḏarrpuy-ya (bulu)*
NEG 1s see.**II** aunt.1-ACC-PROM tomorrow-PROM again

'I won't see my aunt tomorrow (either).' [RN 20190520 3min12s]

(265) **neg pst sameday**

a. *gäthura-ya (bulu) ŋarra nhäwala'may' mukulŋ'nha-ya*
today-PROM again 1s see.**III**-NEG aunt.1-ACC-PROM

'I haven't seen my aunty today (either).' [RN 20190520]

b. *nhäwala'may' ŋarra(na) gäthura mukulŋ'-nha-ya*
see.**III** 1s-SEQ today aunt.1-ACC-PROM

'I didn't see my aunt today.' [AL 20190522 14min18s]

(266) **neg past distant**

a. *baman'dja yothuthinaŋ ŋarra nhäwala'may' ŋarra mukulnhaya*
before-PROM child.TEMP.SEQ 1s see.**III**-NEG 1s aunt.1-ACC.PROM

'When I was a kid, I never saw my aunt.' AL 20190522 17min

b. *yothu-ganyaŋ'tja rra, nhäwala'may ŋarra, mukulŋ'nha-ya*
child-DIM-PROM 1s see.**III**-NEG 1s aunt.1-ACC-PROM

'when i was a kid, i never saw my aunt.' [RN 20190520]

(267) **neg past hab**

a. *nhänha'maynydja rra muka mukulŋ'nha-ya, yothu-thaŋ'tja*
see.**IV**-NEG-PROM 1s ok aunt.1-ACC-PROM child-TEMP-PROM

'.' [RN 20190520]

(268) **deontic modality**

a. *balijiman'djana waŋana: helmet'muru nhe. wäŋa-ŋura-nu nhe nhini.*
policeman-PROM-SEQ say.**III** helmet-PRIV 2s home-LOC-SEQ 2s sit.**II**

'The policeman said "You don't have a helmet. You must stay home."'
[DW 20190522 36min15]

For epistemic modalities, the same strategy as djr seems to apply (i.e. an adverbial *bärri* that, like djr (guf) *mak(u)* doesn't exert any licensing conditions on the inflection)

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