Mapping Irreality: Storyboards for Eliciting TAM contexts*

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1   Introduction

In this study, we discuss temporal-modal distinctions in six Oceanic languages of Vanuatu. In particular, we will look at how counterfactual futures are encoded in each language. We model these temporal-modal systems with a branching-time framework (going back to Thomason, 1970), which allows for more fine-grained distinctions of meanings compared to the traditional binary distinction between realis and irrealis.

Some of the domains we can thus distinguish are neither widely recognized in formal semantics nor in typology. A case in point is the counterfactual future, as expressed in *If you won the lottery tomorrow, what would you do?* This has also been referred to in the literature as *future-less-vivid* (Iatridou, 2000). This type of context is also quite rare in natural discourse so that the small corpora from language documentation that are the primary source of our research did not contain any instances.

In a branching-time model with a superimposed linear ordering of indices according to time values, the counterfactual future can be defined as indices that are not successors of the actual present i_0 and are temporally later than i_0. This domain is illustrated in figure 1.
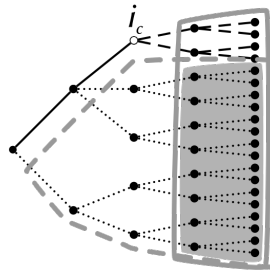

Figure 1: Shaded area: counterfactual future; solid outline: future; dashed outline: counterfactual indices; vertically stacked indices are taken to be simultaneous.

Depending on whether a TAM system puts more emphasis on modal or on temporal orientation, future counterfactuals may either pattern with possible future contexts, or with past counterfactual ones – or they may receive a different marking altogether. Since the languages

of our study tend to be mood prominent, we had a cautious expectation that they would group the counterfactual future with counterfactual past rather than the possible future. This expectation was only partially borne out. At the same time, we expected significant variation between our subject languages, based on prior observations of the region. Our comparative study proves that TAM systems even in closely related languages of Vanuatu indeed show remarkable variation.

In order to answer our questions empirically, we worked with storyboard elicitations (Burton & Matthewson, 2015). Many of the existing storyboards already target specific TAM contexts so that we could use several storyboards designed by others. However, certain relevant domains have never been covered by storyboards or similar elicitation methods, to the best of our knowledge. We have therefore designed a set of storyboards that fill the gaps in previous elicitation tools. One of those gaps concerns the counterfactual future, which is the main focus of this paper. We will report our hypotheses, the storyboards we used to address them, and our results.

2   Preliminary observations

The six languages of this study are Dalkalaen, Daakaka, Daakie, North Ambrym, Mavea and Nafsan (South Efate). They are all Oceanic languages of Vanuatu, with speaker populations ranging from about 30 (Mavea) to around 5000 (Nafsan). Map 2 shows the locations in which the languages are primarily spoken.
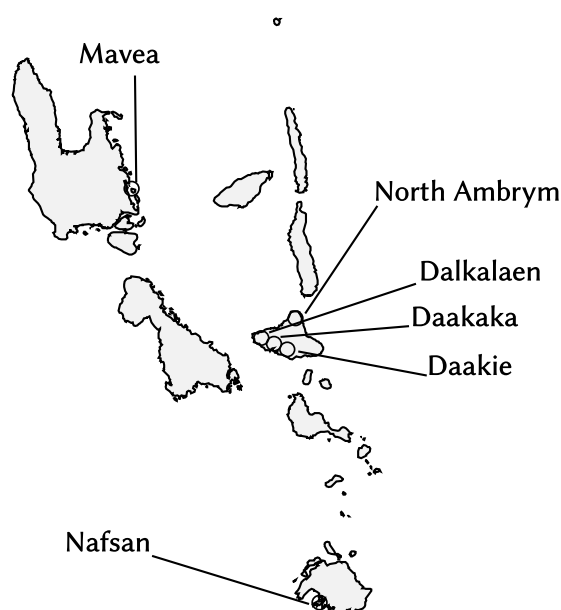

Figure 2: A map showing the section of Vanuatu in which the primary speaker populations of the subject languages are located.

Despite many structural similarities, the subject languages differ in how they mark finite predicates for TAM. On the more analytic part of the spectrum, TAM markers are clitics or particles that occur between the subject agreement marker and the verb root. An example for this is Daakaka, as shown in table 1.[2]

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[2]Abbreviations: 1DL – first person dual; 1PL – first person plural; 1SG – first person singular; 2DL – second person dual; 2PL – second person plural; 2SG – second person singular; 3DL – third person dual; 3PL – third person plural; 3SG – third person singular; AGR – agreement; ASR – assertion; AUX – auxiliary; CL3 – possessive class 3; CL – possessive class; COMP – complementizer; COND – conditional; CONT – continuous; COP – copula; CTF – counterfactual DIST – distal; DL – dual; DP – direct possession; EXCL – exclusive; FUT – future; GEN – general

Table 1: Structure of the finite verbal complex in Daakaka

SUBJ.AGR	(=)TAM	(AUX)	(REDUP-)	**Verb**	(-RES)	(=TRANS)
na/ko/ …	=m, …	du/pwer	…	…	…	=ne

An example for how these elements can combine within a sentence is given in (1):

(1) na=m   yungpan=ne   wye
     1SG=REAL thirsty=TRANS water

"I'm thirsty for water."

In some other languages under investigation, the finite TAM marking merges more closely with the subject agreement marker, yielding in some cases portmanteau subject-TAM proclitics. This is illustrated by the following example from Nafsan, where the proclitic *ka* simultaneously encodes person and number features of the subject and irrealis modality.

(2) **ka**=fan   saof-i-r   Ertap
     1SG.IRR=go:IRR visit-TRANS-3PL.O Eratap

"I will visit them at Eratap."

Portmanteau subject proclitics can also be found in Mavea and North Ambrym.

Many Oceanic languages have been described as distinguishing between realis and irrealis mood. While realis expressions are restricted to the actual past and present, irrealis expressions refer to possibilities, counterfactual developments and the future. They are also often used in directives. Furthermore, the irrealis distinction interacts in complex ways with negation. The typological validity of the irrealis category has been hotly contested (Bybee et al., 1994; Bybee, 1998; Cristofaro, 2012; de Haan, 2012). But at least in the context of Oceanic languages, there is widespread agreement that irrealis is a meaningful grammatical category (Elliott, 2000; Lichtenberk, 2016).

In the project languages, too, the distinction between realis and irrealis modalities plays a central role in the organization of TAM systems. At the same time, TAM systems are usually not structured around a simple binary distinction but show a more complex situation. For example, in Nafsan there are three sets of subject proclitics – the general set, which is mostly used for realis contexts; the irrealis set mostly used for futures; and the perfect set with the corresponding aspectual information (Thieberger, 2006).

To give one more example, the Daakaka TAM paradigm has three major modal-temporal distinctions: The realis, which is responsible for the actual present and past; the potential marker, which is responsible for possible futures and epistemic possibilities of the present; and the distal marker, which refers to the actual, discontinuous past, to counterfactual developments of the past, present and future, and to epistemic possibilities of the past. The open-polarity marker *doo* is restricted to embedded polarity questions; the change-of-state marker *bwet* has the same temporal-modal values as the realis marker but comes with an additional aspectual interpretation. This system is shown in table 2.

The realis marker refers to events of the actual past or present:

Table 2: The Daakaka TAM system

	enclitic	proclitic	monosyllabic
Pos. Realis	=*m*	*mw*=	*mwe/mV*
Neg. Realis			*to*
Pos. Potential	=*p*	*w*=	*wV*
Neg. Potential	=*n*		*nV*
Distal	=*t*	*t*=	*tV*
(Open Polarity			*doo*)
(Change of State			*bwet*)

(3) *s-an   naana   mwe   vyan yen too*
     CL3-3SG.POSS mother REAL go   in   garden
     "his mother went to the garden"

The potential marker refers to the possible future and to possibilities of the present. An example of the potential marker with reference to the future is given in (4):

(4) *barvinye swa **ka** **we** luk   teve-sye   m-ada   em*
     grass   one ASR POT grow side.of-3SG.POSS CL3-1DL.IN.POSS house
     'a grass will grow next to our house' (sto17:13)

The following example illustrates the distal marker with a counterfactual reference:

(5) *Nye   na   bwe   dimyane ka   ebya-ok   we   pwer kyun,*
     1SG 1SG REAL;CONT want   COMP wing-3SG.POSS POT stay just

     *na=**t**   ka pini or.*
     1SG=DIST fly fill place
     'I wish I had wings, I would fly around everywhere.' (ess01:3)

These empirical facts have been described in more detail in von Prince (2015, 2017b). The basic three-way distinction in Daakaka corresponds roughly to the three modal-temporal domains created by a branching-time frame described in the following section.

3   Mapping Irreality

The theoretical basis for our hypotheses has been fleshed out in von Prince (2017a,b).

The main ingredient for our analysis is the branching-times structure that is a well-established tool for exploring the relation between temporal and modal reference (e.g. Dowty, 1977; Thomason, 1984; Condoravdi, 2002; Laca, 2012; Ippolito, 2013).

Our basic definition of the branching structure follows Thomason (1970, 1984):

(6) Definition Branching Times: A branching-times frame $\mathfrak{A}$ is a pair $\langle I, < \rangle$, where

 a. I is a non-empty set of indices i; $<$ is an ordering on I such that if $i_1 < i$ and $i_2 < i$, then either $i_1 = i_2$, or $i_1 < i_2$, or $i_2 < i_1$.

 b. A **branch** through i is a maximal linearly ordered subset of I containing i.

 c. An index i_1 is called a **predecessor** of i_2 iff $i_1 < i_2$; it is a **successor** of i_2 iff $i_2 < i_1$

Traditionally quantification over branching times has been restricted to those branches that are identical up to the actual present. Thus, in the toy model represented in the following figure, if i_2 is the actual present, then quantification is restricted to branches b_3, b_4.
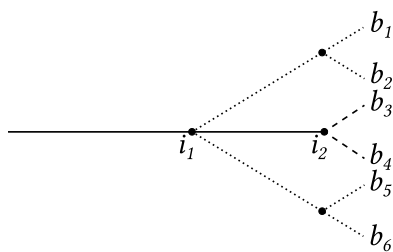
Figure 3: A branching-times structure. Relative to i_2, the solid line represents the actual past, the dashed lines the possible futures and the dotted lines counterfactual developments.

It is also possible to quantify over all six branches $b_1, \ldots b_6$, if one shifts the perspective backwards to i_1. However, it is not possible to quantify exclusively over b_1, b_2, b_5, b_6, because from i_2 they are not accessible at all, and from the perspective of i_1 the precedence relation cannot distinguish them from b_3 and b_4. The decision to restrict quantification in this way was originally well motivated, since the model was designed to define historical accessibility. We here follow von Prince (2017a,b), however, in lifting this restriction. Instead of a two-way distinction between the actual past and present and the possible futures, we can in addition exclusively quantify over counterfactual indices as well. The precedence relation generates the following three-way distinction between modal-temporal domains relative to the contextually defined actual present i_c:

(7) a. the actual (past or present): $\{i | i \leq i_c\}$
     b. the counterfactual (past, present or future): $\{i | i \nleq i_c, i_c \nless i\}$
     c. the possible (future): $\{i | i_c < i\}$

These domains will be indicated graphically as shown in figure
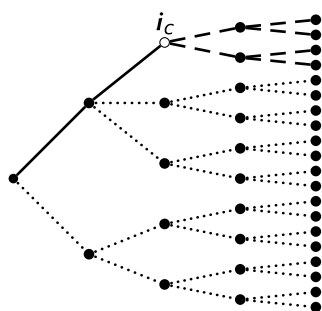
Figure 4: Solid: actual indices; dashed: the possible future; dotted: counterfactual indices;

As proposed in von Prince (2017b), this three-way distinction corresponds roughly to the three domains referred to by the main Daakaka TAM categories: The actual domain corresponds to the realis marker, the possible future domain to the potential mood, and the distal marker is the only one with a reference to the counterfactual past and present. The situation is different for each of the subject languages.

Prior to our storyboard elicitations, we had a preliminary picture of the main distinctions that were implemented in each TAM system. For counterfactual past contexts, however, we had only very little data. For counterfactual future contexts, we did not have any data in any

of the subject languages. The state of our knowledge prior to storyboard elicitations in 2017 is depicted in table 3.

Table 3: The state of our knowledge about distinctions between TAM contexts prior to storyboard elicitations.

Language	Actual past/present	Possible future	Count. past	Count. future
Mavea	SUBJ.(REAL)	FUT, SUBJ.(IRR)	(IRR), *imte*?	(IRR), $\emptyset$?
Nafsan	$\emptyset$	SUBJ.IRR	IRR?	?
Daakie	REAL/DIST	POT	DIST	?
Daakaka	REAL/DIST	POT	DIST	?
Dalkalaen	REAL/DIST	POT	?	?
North Ambrym	REC.PST/ NREC.PST	IRR	CTF	?

We wanted to use the storyboards to consolidate our knowledge about counterfactual past contexts and to explore in particular counterfactual future contexts:[3] Would they pattern with the counterfactual past or with the possible future? In other words: Would they prioritize the temporal dimension or the modal one?

4 Storyboards for targeted elicitation

4.1 Methodology

Storyboards are a highly efficient tool for eliciting utterances that target a well-defined meaning, while supplying a rich discourse context and ensuring a certain degree of naturalness. The general methodology is described in Burton & Matthewson (2015). During our fieldwork, we ran each storyboard with four to ten speakers per language. We presented each speaker with the pictures and walked them through the stories before letting them retell the stories. Sometimes, speakers did a practice round. In some cases, we also used the Bislama version of the storyline to help speakers paraphrase the pictures and tell the stories. Valérie Guérin was responsible for the fieldwork on Mavea. Michael Franjieh was in charge of the storyboards in North Ambrym. Ana Krajinović covered Nafsan. Manfred Krifka was responsible for Daakie. And Kilu von Prince was in charge of Daakaka and Dalkalaen.

Except for Guérin, fieldwork was carried out after a workshop in Vanuatu's capital Port Vila, which introduced the storyboards and provided instructions in the summer of 2017. Guérin had completed her fieldwork earlier the same year, after a visit to Berlin where we discussed the stimuli and methods.

For optimized searches and analysis we have used the search and visualization platform ANNIS (Krause & Zeldes, 2016), with our corpus data prepared for it using ToolboxTextModules (Druskat, 2018) for the conversion framework Pepper for linguistic data (Zipser & Romary, 2010).

4.2 Storyboards used

In order to elicit counterfactual past conditionals, we used two storyboards from the Totem Field Storyboard site: The "Fortune Teller" storyboard (TFS Working Group, 2010) and the "Woodchopper" storyboard TFS Working Group (2011b). Both storyboards also prompt speakers to utter indicative conditionals about the future and thereby provide valuable minimal pairs for the difference between counterfactual and indicative conditionals. In this context, we will focus mostly on the positive conditionals from the "Fortune Teller".

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[3]In the typological literature, counterfactual future conditionals are also known as hypothetical conditionals (Longacre & Thompson, 1985).

In TFS Working Group (2010), a woman called Mary has a hard time deciding whether to marry a (specific) tall young man or a short and fat one. She asks a fortune teller for advice. The fortune teller predicts: *If you marry the tall one, you two will have many children!* – the corresponding picture is shown in figure 5. This first contexts is about the possible future.

Figure 5: Possible future: "If you marry the tall one, you two will have many children!" (TFS Working Group, 2010)

The second target context is about the counterfactual past. Many years later in the same story, Mary learns about the accidental death of her second suitor, the short man. Wondering how her life would have turned out had she chosen him, she returns to the fortune teller. The fortune teller tells her: *If you had married the short one, you two would have been rich.* The corresponding picture is shown in figure 6.

Figure 6: Counterfactual past: "If you had married the short one, you two would have been rich."

None of the pre-existing materials however target the counterfactual future. In order to fill this gap, we produced the Festival storyboard (von Prince, 2018c): There are two boys, let's call them Sam and Luk. There is a three-day festival at their hometown or village, where each day comes with a different activity. There is a football game on the first day, the second day brings a concert, and on the third day there will be a volleyball game. On the second day of the three-day event, Sam and Luk talk about the activities. Sam asks Luk whether he played football the day before. Luk says that he didn't, because it was raining. Then he says: *If I had played, I would have gotten wet.* The corresponding picture is shown in figure 7.

This first target context thus produces a counterfactual conditional of the past as a closely minimal control sentence. The target context for the counterfactual future is as follows: Sam goes on to ask Luk about the volleyball game tomorrow. Is he planning to play then? Luk says, no, he is not going to play. The reason is that he has cut his finger. He says: *If I played tomorrow, my finger would bleed again.* The corresponding picture is shown in figure 8.

We used a total of ten storyboards to cover also false-belief reports, intensional relative clauses, epistemic possibility, and similar (von Prince, 2018a,b,c,d,e; Rolka & Cable, 2010;
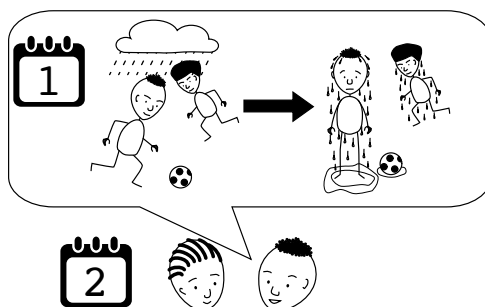
Figure 7: Counterfactual past: "If I had played (yesterday), I would have gotten wet."
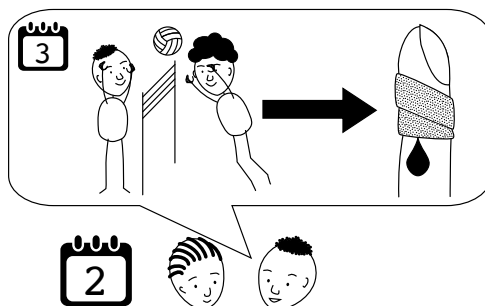
Figure 8: Counterfactual future: "If I played (tomorrow), my finger would bleed again."

TFS Working Group, 2011a; Vander Klok, 2013; TFS Working Group, 2011b, 2010). In this article, we will primarily report the results from the two storyboards discussed here.

5   Results

In several languages we discovered previously undescribed TAM morphemes, or previously undescribed TAM-related uses for specific morphemes. Even on a merely descriptive basis, this work therefore contributes significantly to the our knowledge of these languages. In this section, we will address two main topics: 1) morphology that is specific to counterfactual conditionals (of the past or otherwise); and 2) the marking of the counterfactual future: Does it pattern with the counterfactual past or with the possible future?

5.1   Nafsan

Nafsan has three paradigms of subject proclitics. Two of those paradigms are portmanteau morphemes that also encode TAM values in addition to person and number features of the subject. This system is shown in table 4.

Table 4: Subject proclitics for singular subjects in Nafsan based on Thieberger (2006)

	General form	Irrealis	Perfect
1sg	*a=*	*ka=*	*kai=*
2sg	*ku=*	*p̃a=*	*kui=*
3sg	*i=*	*ke=*	*ki=*
		⋮	

These subject proclitics optionally combine with a TAM marker from a small paradigm including the conditional marker *fla/f*. According to Thieberger (2006), conditional clauses are always formed with this marker. In our elicited data we only found the *f* version of the conditional marker, and its use was obligatory in conditionals, as expected. Alternatively, a

conditional clause may be introduced by the formula *(i=)f-wel (kin)* "if it is like". These generalizations were confirmed by our findings. One example is given below, showing the use of the *if wel kin* construction:

(8)   **I=f-wel**   **kin**   **ku**=*taulu*   *John, akam rak=fo*   *pitlak teesa*
      3SG=COND-like   COMP   2SG=marry   John   2DL   2DL.IRR=PSP.IRR   have   children

        ruk=fo   *laap.*
        3PL.IRR=PSP.IRR   many

      "If you marry John, you will have a lot of children." (AK-010.24)

We found that, in the protasis of future-oriented indicatives and all counterfactual clauses, both the general and the irrealis proclitics can be found. However, the protasis and apodosis of present/past-oriented indicatives appear to be restricted to general proclitics, as illustrated by the following example:[4]

(9)   **F-wel**   **kin**   *npat-i-n*   **i**=*miel,*   *go Yokon m̃as kin*   **i**=*paam*
      COND-like   COMP   teeth-V-3SG.DP   3SG=red   then   Yokon   only   COMP   3SG=eat

        nawi miel gaag.
        yam   red   2SG.POSS

      "If her teeth are red, then Yokon is the one who ate your red yam." (AK1-060-01.39)

The apodosis of future-oriented conditionals and all counterfactuals is always in irrealis mood. This is illustrated by example (8) for indicative conditionals above, and for future- and past-oriented counterfactuals below:

(10)   **I=f-wel**   **kin**   **ka**=*mes*   *"vole"*   *matol,*   *go nfag nen kin*
      3SG=COND-like   COMP   1SG.IRR=play   volleyball   tomorrow   and   sore   that   COMP

        a=*tai*   *naru-k*   **ke**=*fo*   *mer*   *toop.*
        1SG=cut   hand-1SG.DP   3SG.IRR=PSP   again   big

      "If I played volleyball tomorrow, the sore that I cut on my hand would become big again." (AK1-021-01.49)

(11)   **I=f-wel**   **kin**   **a**=*mes*   *futbol*   *nanom,*   **ka**=*fo*   *lom.*
      3SG=COND-like   COMP   1SG=play   football   yesterday   1SG.IRR=PSP.IRR   wet

      "If I had played football yesterday, I would have gotten wet." (AK1-021-01.39)

This means that possible-future conditionals can have the exact same form as counterfactual-future and counterfactual-past conditionals. It is however also possible to specify a conditional as counterfactual – regardless of its temporal orientation – by including the morpheme *mer* in the protasis:

(12)   **ka=f**   **mer**   *pei*   *p̃i*   *"bol"*   *nanom,*   **ka**=*fo*   *lom*
      1SG.IRR=COND   CTF   first   kick   ball   yesterday   1SG.IRR=PSP.IRR   wet

        usrek.
        completely

      "If I had played football yesterday I would have gotten soaked." (AK1-004-01.163)

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[4]This is from a storyboard not discussed further for reasons of space. In it, Mary tries to find out who stole and ate her red yam and her friend suggests she look at the teeth of her prime suspect to find out (von Prince, 2018d).

(13) **Ka=f** **mer** *mes "volibol" matol,* *nakni-k* **ke=fo**
1SG.IRR=COND CTF play volleyball tomorrow finger-1SG.DP 3SG.IRR=PSP.IRR

   mra.
   bleed

   "If I played volleyball tomorrow, my finger would bleed." (AK1-004-01.23/24)

Outside of the protasis of counterfactual clauses, *mer* means "again", as has already been observed in Thieberger (2006). Its function in counterfactual clauses has not been observed prior to this study and is a new empirical result of our fieldwork. Another new observation is that, at least in the configuration seen in (13), the conditional marker *f* can combine directly with an irrealis proclitic. Thieberger (2006) has previously stated that *f* can only combine with general proclitics.

In sum, irrealis subject proclitics are indeed restricted to irrealis contexts. They are obligatory in the apodosis of any conditional with non-actual reference. Counterfactual conditionals can optionally be distinguished from the possible future by the morpheme *mer*. This result is illustrated in figure 9.
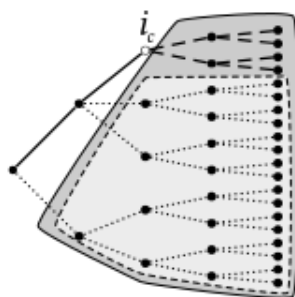
Figure 9: The irrealis domain in Nafsan. Solid outline: irrealis subject proclitics; dashed outline: optional *mer*.

5.2 Mavea

For Mavea, Guérin (2011) reports that conditional clauses of all kinds are marked by the conditional affix *mo*, which comes between the subject and the verb root. This was confirmed by our findings, as illustrated by (14):

(14) *ko-**mo**-l-to* *tuan nna me natu-mrua* *me i-lavoa*
2SG-COND-IMPF-stay with 3SG FUT child-1PL.EXCL.DL FUT 3SG.IRR-big

   "If you stay with him, your children will be many." (VG20171060.020)

For counterfactual contexts specifically, Guérin (2011) also reports the use of *imte* or *inte*, which is also a verb meaning *wish*. This element might have developed from a morphologically more complex structure that is shown in (15):

(15) *i-mo-te*
3SG.IRR-COND-some

   "if it were" (Guérin, 2011, 234)

We can also cautiously confirm that this morpheme is specific to counterfactual contexts of the past and future. Outside of the contexts that are the focus of our discussion, there are also a few occurrences of *imte* that are ambiguous between counterfactual and indicative future contexts. In the target contexts of the present study, *imte* only appeared in counterfactual conditionals of the past, as in (16):

(16) ***imte*** *ka-v*   *ka-v̋a*   *v̋alu-na*   *ro*   *me*   *[...]*   *m̋auri* *rarua*
     if   1SG.IRR-say   1SG.IRR-go   to-3SG.POSS   then   FUT   life   3PL.DL

     i-isav̋ai
     3SG.IRR-how

     "Suppose I had stayed with him […] how would our life have been?"
     (VG20171047.056-058)

The two oldest speakers used *imte* in counterfactual contexts quite consistently. The younger speakers did not use it at all. This might indicate that it is a vanishing feature of the language. This situation was also already observed by Guérin (2011, 380).

     Another feature that showed up regularly in counterfactual conditionals of the past is the morpheme *me*. It has previously been described as a future marker in Guérin (2011, 217). It occurs in the apodosis of these conditionals:

(17) *ka-mo-lo-to*   *tuan* ***me*** *m̋auri-ku*   *i-pal*   *sa*
     1SG.IRR-COND-IMPF-stay   with   FUT   life-1SG.POSS   3SG.IRR-like   what

     "…if i had stayed with Peri how would my life have been?"
     (VG20171060.031-032)

In all likelyhood, though, *me* does not contribute to the absolute modal-temporal reference of the conditional but rather marks the apodosis as being temporally later than the protasis. We know from previous corpus data and description that the future reference of *me* is relative to topic time rather than utterance time, like apparently most future markers in Oceanic languages:

(18) *mo-ntao* ***me*** *ro* *i-lo-to*   *aro* ***me*** *m̋arao* *i-an*   *nna*
     3SG-afraid   FUT   then   3SG.IRR-IMPF-stay   here   FUT   eel   3SG.IRR-eat   3SG

     "she was scared that she would stay there and the eel would eat her." (06043.052)

Like the possible future, the counterfactual future and the counterfactual past are consistently marked by the irrealis version of the portmanteau subject proclitics for the first and third person singular.

     Counterfactual-future contexts were equally expressed with the irrealis set of subject agreement markers:

(19) *m̋atan*   *ka-v*   ***ka****-mo-ple*   *tuan* *varango-ku*   *vutpol*
     because   1SG.IRR-say   1SG.IRR-COND-kick   with   finger-1SG.POSS   football

     i*-mo-voreia*   ***me*** *ro*   ***i****-dae*
     3SG.IRR-COND-hit   FUT   then   3SG.IRR-blood

     "because if I play with my finger, if the ball hits it, it will bleed." (VG20171008.051/52)

Figure 10: Our current best hypothesis about the marking of irreality in Mavea. Solid outline: irrealis subject proclitics; dashed outline: *imte*; dotted outline: relative future *me* (this may shift in any direction depending on the topic index.)

In sum, Mavea has irrealis portmanteau subject proclitics for the first and second person singular that are used in all non-actual domains, comprising the possible future, the counterfactual past and the counterfactual future. The morpheme *imte* is used by older speakers in counterfactual context of the past, but also in a few other irrealis environments that we can not exhaustively disambiguate. The morpheme *me* probably marks relative future irrespective of modal and absolute-temporal reference. We therefore see a binary distinction between realis and irrealis modalities, with *imte* possibly being specific to counterfactual contexts. This situation is illustrated in figure 10.

5.3 North Ambrym

Franjieh (2012) reports the paradigm of TAM markers that partially fuse with the subject proclitics that is summarized in table 5.

Table 5: The core system of TAM markers in North Ambrym

Gloss	Realization	Description
REC.PST	*mV/m-/-m*	recent past, past/present for non-telic predicates.
NREC.PST	*te/te-/to-/-rr*	non-recent past
IRR	*f-/bV/b-/-∅*	irrealis
CTF	*to*	counterfactual past/present
AVE	*ne/-n*	avertive: unmet expectations about the future

The possible future is referred to by the irrealis mood in combination with the potential marker *e*:

(20)   *Jon, bone **fō***   *ktu, lo*   *mwen-amrō*   *teere nyer **e-ve***
     John time 2SG.IRR take then GEN.CL-2DL.POSS child PL POT-COP.IRR
     lol.
     plenty
     "If you marry John, you will have many children." (ib1-fortune-na.35)

All five speakers produced the two target contexts for a counterfactual conditional of the past in the same way, with the counterfactual marker *to* in the protasis and the non-recent past marker *te/-rr* in the apodosis:

(21)   *ō*   ***to***   *yene Adam lo*   *mwena-mrō*   *mane **te***   *lam.*
     2SG CTF marry Adam then POSS.CL-2DL.POSS money NREC.PST big
     "If you had married Adam, you two would have been rich." (at1-fortune-na.24)

(22)   *Na*   ***to***   *rrō*   *plei bol, lo*   *na-**rr***   *loo.*
     1SG CTF CONT play ball then 1SG-NREC.PST get.wet
     "If I had played football, I would have gotten wet." (at1-lafet-na)

This confirms that the counterfactual marker *to* is specialized for counterfactual (past) contexts, while it also shows that the non-recent-past marker is not restricted to the actual past.

In some of the counterfactual past conditionals, we also find the continuous marker *rro* in the protasis. The above example is one such case. This was however rather the exception than the rule.

The target clauses for counterfactual future conditionals were realized in irrealis mood in the protasis and the apodosis. This was consistent across all five speakers. Some also used the potential marker *e* in either the protasis, the apodosis or both.

(23) *He **e-na-∅**   plei, lo ge rrang **e-b**   gurr mōl mōn*
      if   POT-1SG-IRR play then SUB blood POT-IRR flow back again
      "If I played then the blood would flow again." (ib1-lafet-na.27)

In sum, we get the picture that in North Ambrym, the counterfactual marker *to* is specific to the counterfactual past. The non-recent past marker also extends to the counterfactual past in conditionals with *to* in the protasis. The counterfactual future, like the possible future, is by default referred to by the irrealis marker. This is illustrated by figure 11.
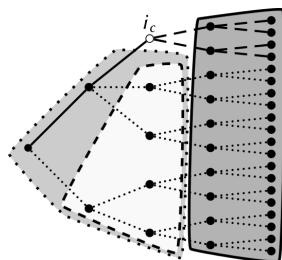

Figure 11: Our current best hypotheses about the domain of irrealis in North Ambrym. Solid outline: irrealis; dashed outline: counterfactual (past/present); dotted outline: non-recent past.

5.4 Dalkalaen

Dalkalaen is the least described of the six subject languages. We have an as yet unpublished grammar sketch by von Prince based on intense fieldwork between 2009 and 2012. The language is closely related both to North Ambrym towards the north of the same island and to Daakaka towards the east. Its TAM system shows similarities with both its neighboring varieties. The core markers are shown in table 6.

Table 6: The paradigm of core TAM markers in Dalkalaen as attested prior to this study.

Gloss	Realization	Description
POS.REAL	*mV/=m/m=*	actual past or present
NEG.REAL	*to*	negative statements about the actual past/present
DIST	*tV*	non-recent past, counterfactual past, temporal clauses
IRR	*bV/-∅*	relative future
NEG.IRR	*-n*	prohibitives, negative futures

Conditionals about the possible future are formed with both the protasis and the apodosis in irrealis mood. Both parts are also accompanied by the clause-initial marker *ba*, which has a similar distribution to the North Ambrym potential marker described above. This is illustrated in (24):

(24) *Bone en   ngae nga   **ba**   ko=∅   lene yaafu berep enti, **ba***
      when COMP COMP COMP POT 2SG=IRR marry man long this POT

      *s-amro   tejimre nye **ba**   ra=∅ ngor en   **ba**   ra=∅ ngor*
      CL3-2DL.POSS child   PL   POT 3PL big COMP POT 3PL big
      "If you marry this tall man, you will have very many children." (fortuneteller-am.16/17)

Counterfactual past conditionals were marked remarkably consistently across speakers: The protasis of each utterance is in potential mood, with a continuous-aspect auxiliary. The apodosis is introduced by the morpheme *bala*, or, in one out of ten cases, by *ba*; the apodosis is then marked by the distal.

(25) *a*   *ko-∅*   ***do***   *kirine* *yaafu* *mwermwer* *enti,* *ma*   *kala* *lo*   ***bala***
      COMP   2SG-IRR   CONT   follow   man   short   this   REAL   say   then   CTF

      s-amro   *ver*   ***ti***   *fwe*   *en*   *ti*   *fwe*
      CL3-2DL   stone   DIST   many   COMP   DIST   many

"'If you had married the short man', she said, 'then you two would have been very rich.'"
(fortuneteller-am.30/31)

(26) *ka*   *na-∅*   ***do***   *kirine* *ple*   *futbol=an*   *lo*   ***bala*** *na*   ***to***
      COMP   1SG-IRR   CONT   follow   play   football=NMLZ   then   CTF   1SG   DIST

      loo-koko
      get.wet-full

"If I had joined the football game, I would have gotten soaked." (lafet-am.17)

The morpheme *bala* has not been observed before. It was now found only in counterfactual contexts, mostly referring to the past. Two instances indicate that it might also be used in counterfactual future contexts. It did however not occur in the target contexts for the counterfactual future.

Conditionals about the counterfactual future pattern with those about the possible future: They are in irrealis mood and modified with the potential mood marker *ba*:

(27) ***ba***   *na-∅*   *kirine* *ple=an*   *lo*   ***ba***   *riy-ak*   ***bo***   *rop*   *kebu.*
      POT   1SG-IRR   follow   play=NMLZ   then   POT   blood.of-1SG.POSS   IRR   run   back
      "If I played [tomorrow], I would bleed again." (lafet-am.22)

In sum, Dalkalaen uses irrealis and potential mood with reference to the possible and counterfactual future. Irrealis mood without the potential also occurs in the protasis of counterfactual-past conditionals. Distal mood is used with reference to the counterfactual past, particularly in the apodosis of conditionals. The counterfactual past is usually distinguished from other domains by the morpheme *bala*. This preliminary picture is illustrated in 12. Dalkalaen also employs continuous aspect in the protasis of counterfactual conditionals.
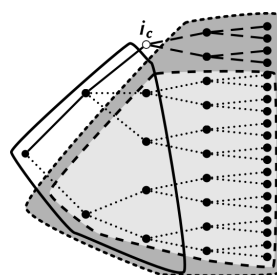

Figure 12: Our preliminary understanding of the Dalkalaen domain of irreality. Solid: distal; dotted: irrealis; dashed: *bala*.

5.5   Daakaka

We have already see an overview of the Daakaka TAM system in section 2. Possible futures are referred to by the potential marker. The protasis of a possible-future conditional can be marked by either the potential marker or the distal:

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(28) *Ko=t*   *lene* *temeli* *man* *na*   *ma*   *waswas* *a*   *veop,* *te*
    2SG=DIST marry child male COMP REAL thin   and long then

    nat-omaa   *nye* *ka*   *ye=p*   *puo.*
    child.of-2DL.POSS PC   ASR 3DL=POT many

    "If you marry the skinny and tall boy, you'll have lots of children." (FortuneTeller_AN18/19)

More often than not, the protasis is introduced by the temporal/conditional subordinator *ka*. The apodisis is invariably marked by the homophonous assertion marker *ka* that expresses assertions about the future or possible present in combination with the potential mood.

(29) ***Ka***   *ko=p*   *pwer* *myane* *na*   *ma*   *veop,* *waswas,* *te*
    COMP   2SG=POT stay   with   COMP REAL long   thin   then

    nat-omaa   *nyoo* ***ka*** *ya=p*   *puo.*
    child.of-2DL.POSS PL   ASR 3PL=POT many

    "If you go with the tall one, the skinny one, you'll have many children" (FortuneTeller_MT.19/20)

The counterfactual past/present is expressed by the distal marker, both in (the apodosis of) conditionals and in false belief reports. In counterfactual conditionals, the protasis is usually in potential mood, but the apodosis is always in distal mood. In many but not all cases, the apodosis is introduced by the formula *bili ka*. This is illustrated in (30):

(30) *ka*   *ko=p*   *pwer* *tevyan* *yaapu* *ente,* *te*   ***bili*** ***ka*** *s-amaa*   *mani*
    COMP 2SG=POT stay with   man   this   then time ASR CL3-3DL.POSS money

    nyoo ***tu***   *puo.*
    PL   DIST plentiful

    "If you had married this man, you two would have been rich." (FortuneTeller_SB.038)

Counterfactual-future conditionals pattern with possible-future conditionals rather than with counterfactual-past ones, with the apodosis being in potential mood.

(31) *ka*   *na=t*   *ple*   *volibol* *te*   *volibol* *ka*   ***we*** *me*
    COMP 1SG=DIST volleyball then   volleyball ASR   POT come hit

    syute   *vy-ok* *te*   *myanok* *ente*   *saka*   *ne* *map.*
    hand.of-1SG.POSS then   wound this   NEG.ASR NEG.POT heal

    "If I played volleyball, the volleyball would hit my hand and then my wound wouldn't heal" (Lafet_AN.14/15)

The overall picture that we get is that the potential mood is responsible for references both to the possible and the counterfactual future. The distal marker expresses a reference to the counterfactual past and present in addition to the actual past. These values appear to be neutralized in
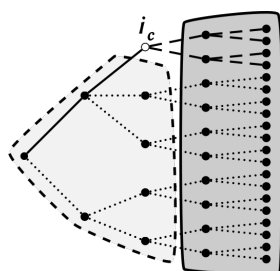

Figure 13: Our current hypotheses about the domain of irrealis in Daakaka. Solid: main domain of the potential marker; dashed: main domain of the distal marker.

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the protasis of conditionals and we will remain agnostic at this point about the meaning of this observation. We will take the function of both markers in the apodosis as crucial for analyzing their meaning.[5] Figure 13 summarizes these conclusions.

5.6 Daakie

The overall situation in Daakie is very similar to Daakaka. The TAM system of the language has been described in Krifka (2012, 2016). One interesting point of divergence is that, while in Daakaka the complementizer *ka* and the assertion marker *ka* are homophonous, their close Daakie counterparts are pronounced differently: The complementizer is also *ka*, but the future marker (similar in its distribution to the Daakaka assertion marker) is pronounced *a*.

(32) **ka**   *ko=p*   *lé-ne,*   *s-amoo*   *timaleh* *ngyee* **a=la=p**
    COMP 2SG=POT marry-TRANS CL3-2DL.POSS child   PL   FUT=3PL=POT

    pwee.
    many

    "If you marry him, you two will have many children" (Fortune_JackPaul)

The counterfactual past is marked by the distal in the apodosis and by a combination of the future marker *a* and the distal marker in the apodosis. This shows that *a* has to be understood as a relative future. It also marks another difference to Daakaka, where the assertion marker *ka* does not usually occur without the additional *bili* in connection with the distal.

(33) *ka*   *ko=t*   *lé-ne*   *Adam,* *s-amoo*   *vot*   **a-te**   *pwee.*
    COMP 2SG=POT marry-TRANS Adam CL3-2DL stone FUT-3SG.DIST many

    "If you had married Adam, you two would have had a lot of money." (Fortune_JackPaul)

The counterfactual future is typically marked like the possible future, even though some speakers appear to hesitate between the potentialis and the distal in the protasis, as has also been observed in Daakaka:

(34) *ka*   *na=p*   *bwengbang* *ne*   *volibol*   *palen,*   *manok* *ne*
    COMP 1SG=POT play   TRANS volleyball tomorrow sore   TRANS

    baakon *velo-k*   **a=bwe**   *top*   *teteh*
    finger.of hand-1SG FUT=3SG.POT break again

    "If I played volleyball tomorrow, the sore on my finger would come open again." (Fortune_JackPaul)

6 Conclusions

We have seen remarkable variation in how our subject languages carve up the temporal modal domain. Only Mavea and Nafsan conformed to our expectation that counterfactual-future contexts would pattern with the counterfactual past rather than with the possible future. In the languages of North and West Ambrym, by contrast, they align with the possible future instead. This finding is summarized in table 7.

In the Ambrym languages, we find that the vertical, temporal dimension is emphasized over the diagonal, modal one. They also tend to have more fine-grained distinctions, especially as we move along to coast towards the west of the island (Dalkalaen) and to the north (North Ambrym). This is illustrated in figure 14.

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[5]von Prince (2017b) assumes that the domain of the distal marker includes possible and counterfactual futures because of its occurrence in the protasis of corresponding conditionals. We do not exclude this analysis here but also consider the option that its reference may be shifted in these contexts.

Table 7: Our prior knowledge updated with new conclusions from the storyboard data.

Language	Actual past/present	Possible future	Count. past	Count. future
Mavea	SUBJ.(REAL)	SUBJ.(IRR)	(IRR), (*imte*)	(IRR), (*imte*)
Nafsan	∅	SUBJ.IRR	IRR, (*mer*)	IRR, (*mer*)
Daakie	REAL/DIST	POT	DIST	POT
Daakaka	REAL/DIST	POT	DIST	POT
Dalkalaen	REAL/DIST	POT	DIST, *bala*	POT
North Ambrym	REC.PST/ NREC.PST	IRR	CTF	IRR
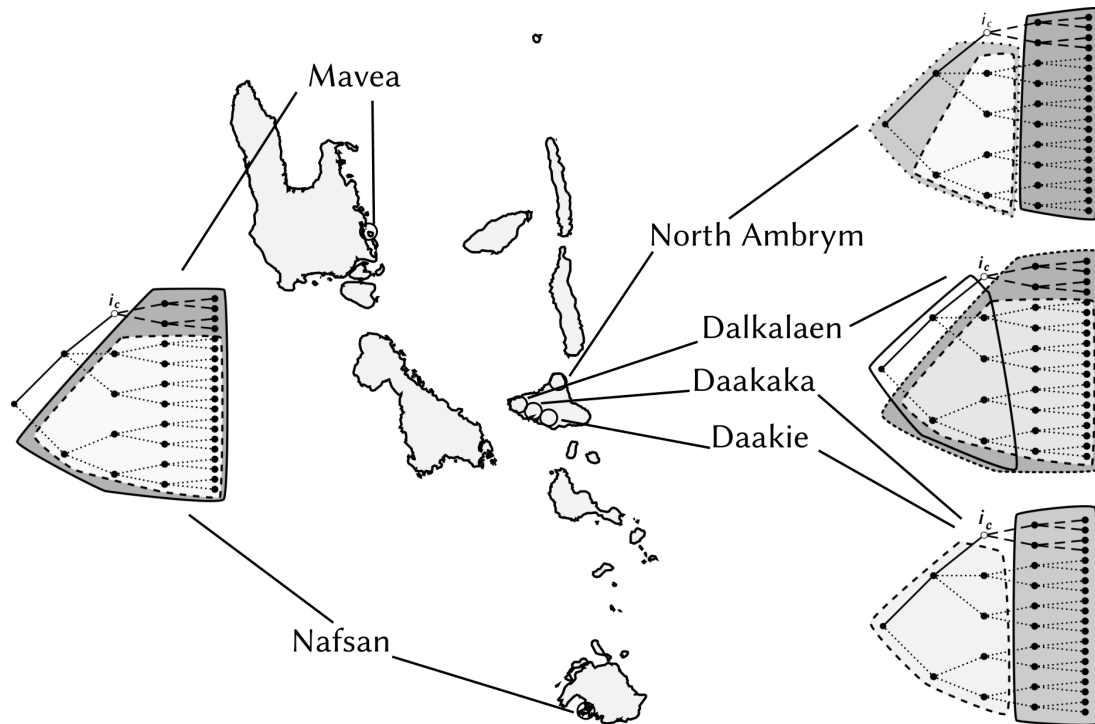
Figure 14: The spatial distribution of different systems around Vanuatu.

The variation we find even between the very closely related languages from Ambrym speaks to the apparent volatility of TAM systems. This is also reflected by the observation that the distinction between counterfactual and possible contexts in Mavea and possibly Nafsan appears to be subject to diachronic change: In Mavea, the use of *imte* is restricted to older speakers. In Nafsan, the use of *mer* in counterfactual contexts might be more productive today than it used to be.

Our research highlights the need to look more closely at the subdomains of irrealis mood to better understand TAM systems. It also shows that even relatively mood-prominent languages can in some subdomains prioritize temporal over modal reference. And that there is significant variation and rapid diachronic change in the TAM systems of Oceanic languages that is far from being well-understood.

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