1 Preamble

1.1 Introducing non-spatial setting

Every language has some means of expressing location or direction of activity — we refer to this as spatial setting. This may be shown with oblique noun phrases and adverbs, as in English:

(a) The possum ran up the tree and hid inside its crown.

In some languages, spatial setting can be expressed with affixes on verbs. Cavineña, a Tacana language from Bolivia (Guillaume 2008: 307-20), has a number of affixes indicating direction and posture of the action or state — some are listed in Table 1.

<table>
<thead>
<tr>
<th>Forms</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>-tsura 'GO.UP': direction up</td>
<td>ani-tsun 'sit upwards'</td>
</tr>
<tr>
<td>-bute/-butya 'GO.DOWN': direction down</td>
<td>ani-bute 'sit down' (also 'land' of planes)</td>
</tr>
<tr>
<td>-sikwa 'GO.AWAY'</td>
<td>ani-sikwa 'sit somewhere else, away from speaker'</td>
</tr>
<tr>
<td>-jara 'LIE'</td>
<td>tawi-jara- 'sleep lying'</td>
</tr>
<tr>
<td>-ani 'SIT', e.g.</td>
<td>tawi-ani- 'sleep sitting'</td>
</tr>
<tr>
<td>-neti/-nitya 'STAND'</td>
<td>peta-nitya- 'look standing'</td>
</tr>
<tr>
<td>-bade 'HANG'</td>
<td>twa-bade- 'wait hanging' (about a snake)</td>
</tr>
</tbody>
</table>

Non-spatial setting covers a complex of parameters to do with:

(i) the timing of the activity: 'tense', in §3;

(ii) the internal structure of activity — whether it was completed or ongoing, whether it took place habitually, whether it reached an endpoint, etc: 'aspect', in §4;

(iii) whether it is probable or possible, or obligatory: 'modality', in §5;

(iv) whether it was realized or not: 'reality status', in §6;

(v) how the speaker acquired the information about it: 'evidentiality', in §7.

See also Dixon (2012: Chapter 19), Aikhenvald (2014: Chapter 7).
Non-spatial setting can apply to a clause or to a sentence (which may consist of several clauses). At the end of this paper, we look at 'non-propositional' non-spatial setting: so called nominal tense, nominal evidentiality and the like (§9).

1.2 What non-spatial setting correlates with

Mood (sentence type) (not to be confused with modality) refers to speech act:

<table>
<thead>
<tr>
<th>SPEECH ACT</th>
<th>GRAMMATICAL CATEGORY (MOOD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>statement</td>
<td>declarative (or indicative)</td>
</tr>
<tr>
<td>command</td>
<td>imperative</td>
</tr>
<tr>
<td>question</td>
<td>interrogative</td>
</tr>
</tbody>
</table>

We can recall, from the previous workshop, how in some languages the three moods may acquire different grammatical marking (e.g. Eibela, Jarawara, Murui, Tariana, Wolaitta).

Parameters of mood/speech act apply to a complete sentence. Parameters of non-spatial setting apply to a clause (see (1)-(3), for different 'tenses' in a main and in a complement clause).

How non-spatial setting may correlate with mood is a special topic (for instance, there are typically fewer evidentials in the imperative mood than in other moods; ditto about tense distinctions). This is the topic of §8.

Negation (polarity) covers a two-member system which can be considered overarching with regard to both mood and non-spatial setting (though negation can and does interact with these, and creates dependencies, especially with reality status).

Clause type: there can be distinct types of clauses, including verbless clauses, verbal clauses, dependent clauses, and within those complement clauses, relative clauses, subordinate clauses etc. Clause types interact with the non-spatial setting. The time reference (realised through 'tense') of complement clauses can be 'relative' to that of main clauses. The time reference ('tense') of a main clause is absolute — that is, it is not defined with regard to anything else. See (1)-(3), from Imbabura Quechua (Cole 1982: 142-3):

(1)  [Marya  Agatu-pi  kawsa-y-ta]COMPL.CL.REL.TENSE  [kri-rka-ni]MAIN.CL.ABS.TENSE
     Maria  Agato-LOC live-PRESENT-ACC     believe-PAST-1p
     'I believed that Maria lived in Agato'

(2)  [Marya  Agatu-pi  kawsa-shka-ta]COMPL.CL.REL.TENSE  [kri-rka-ni]MAIN.CL.ABS.TENSE
     Maria  Agato-LOC live-PAST-ACC           believe-PAST-1p
     'I believed that Maria had lived in Agato (previously)'

(3) Marya Agatu-pi kawsa-na-ta\textsubscript{COMPL.CL.REL.TENSE} [kri-rka-ni]\textsubscript{MAIN.CL.ABS.TENSE} Maria Agato-LOC live-FUTURE-ACC believe-PAST-1p

'I believed that Maria will live in Agato'

Interactions between clause types and the non-spatial setting will be touched upon throughout (see also §8). To understand them, we need to keep in mind what clause types there are in the language.

1.3 How to mark non-spatial setting

Clausal non-spatial setting can be marked through:

- affixes (on the verb) as in Imbabura Quechua;
- clitics, as in Tariana (examples 25-9)
- suprasegmental markers: in Kisi, a South Atlantic language, the perfective aspect by LH, and the habitual by L (Childs 1995: 220, 222; Beck forthcoming):

\[
\begin{align*}
\text{(4a)} & \quad \text{ò LH}^\text{cimbu} \\
& \quad \text{3SG PERF}^\text{leave} \\
& \quad \text{‘She left.’}
\end{align*}
\]

\[
\begin{align*}
\text{(4b)} & \quad \text{ò cìmbù} \\
& \quad \text{ò L}^\text{cimbu} \\
& \quad \text{3SG HAB}^\text{leave} \\
& \quad \text{‘She (usually) leaves.’}
\end{align*}
\]

There can be combinations of segmental (affixal) and suprasegmental marking, e.g. Yuhup (Northwest Amazonia) imperfective aspect \textit{sìw-i} '(he) is cooking' [Low Tone marked with '] versus perfective aspect \textit{sìw-i} '(he) (has) cooked' [High Tone marked with '] (Silva and Silva 2012: 83, 97).

- complex predicates (consisting of several verbs with a marker of dependency; or an auxiliary and a lexical verb), e.g. English progressive \textit{he is coming}:

- asymmetrical serial verb constructions (consisting of several verbs without a marker of dependency), e.g. Kristang (a Portuguese-based Creole: Baxter 1988: 213): completive aspect is expressed with the verb 'finish':

\[
\begin{align*}
\text{(5)} & \quad \text{kora yo ja chegá nalí eli ja kaba bai} \\
& \quad \text{when 1sg PERF arrive there 3sg PERF finish go} \\
& \quad \text{‘When I arrived there he had gone’}
\end{align*}
\]

- independent grammatical forms ('particles') or adverbs, e.g. English \textit{still}. 
There may be combinations of 'particles' and other markers. In Kisi, the tense distinctions in the perfective aspect and the present tense of the habitual are made using particles (niN ‘present’, wO ‘past’), while the past tense of the habitual aspect is marked by lengthening and tonal apophony of the subject marker.

Question: Are there any preferences for marking each type of category? (For instance, it appears that serial verb constructions tend to mark aspect and modality, NOT tense or reality status.) This is one of our questions here.

1.4 Further issues with non-spatial setting

• Potential terminological problems: mood/modality; perfect/perfective
• Proliferation of quasi-synonyms, e.g. durative, continuous, also progressive; perfect, completed/completive
• The parameters of non-spatial setting may not be expressed through a neat inflectional paradigm — for instance, tense and some aspectual meanings may be expressed through affixes, and other aspectual meanings could be expressed through serial verbs. In many languages, the non-spatial setting is more complex than any other set of categories.

2 Outline of parameters

We focus on the following parameters within non-spatial setting:

- **TENSE** — §3
  - **ASPECT**: facets of activity/state — §4:
    - Composition — whether the activity is regarded as having internal temporal constitution (imperfective) or not and is then viewed as a whole (perfective): §4.1
    - Completion — whether the activity was completed (perfect) or continuing non-completed (imperfect): §4.2
    - Phase of activity — starting, continuing, finishing: §4.3
    - Boundedness (or telicity) — whether activity has an end point (telic) or not (atelic): §4.4
    - Temporal extent — whether instantaneous (punctual), or extending over a period of time (durative, progressive, or continuous): §4.5
    - Degree — whether done a lot or a bit: §4.6
    - Frequency — whether done once (semelfactive) or more than once/many times: §4.7
    - Manner, including speed and ease: §4.8

- **REALITY STATUS** — distinguishing between irrealis, roughly covering what has not (yet) happened, and realis (what has happened or is happening): §5
- **MODALITY**, or degree of certainty and attitude to what is happening — likely, unlikely, possible, probable, obligatory: §6
3 Tense

Every language has a way of talking about the time of an event, or of a state. There is typically a set of lexical items which refer to location in time, e.g. 'yesterday', 'today', and so on. 'Tense' refers to a closed set of grammaticalised expressions of location in time.

3.1 Absolute tense in declarative clauses

Grammatical tense may involve present, past and future (such straightforward simple systems are in fact hard to find). An oft-quoted example comes from Lithuanian:

(6) present: dirb-u 'I work, I am working'
past: dirb-au 'I worked, I was working'
future: dirb-siu 'I will work, I will be working'

Imbabura Quechua (Cole 1982: 143-6):

(7) present: shamu-ni 'I come'
past: shamu-rka-ni 'I came'
future: shamu-sha 'I will come, I might come'

Many languages distinguish just two terms. One possibility is past versus non-past (which covers future and present), as in Estonian

(8) non-past: armasta-n (love-1sg) 'I love, I will love'
past: armasta-si-n (love-PAST-1sg) 'I loved'

No language distinguishes present versus non-present in its system of grammatical tense.

Note that the notion of 'PRESENT' tense is elusive. As Dixon (2012: 13) put it: 'present time is but a moment, yet only an event with duration can properly be described as "present"'. What is traditionally called 'present' in English has habitual, or generic, overtones. I get up late refers to what I usually do. And if I need to say what I am doing right now, I will use a so-called progressive form, I am getting up. In many languages, 'present' forms have generic overtones...

The future does not relate just to time. Any statement about the future may have overtones of possibility, probability and prediction. 'Irrealis' can be used to cover future meanings. In many languages, future can be considered a kind of modality — we turn to these in §6.
In Lithuanian (6) and Estonian (8) future can be considered part of a 'tense' paradigm. In Imbabura Quechua (7) future is used for 'probabilistic' statements and overlaps with modality.

Many languages have several tense forms for the past. Yimas, a Lower Sepik language from New Guinea, has four past tenses:
• the near past, marking events which occurred yesterday,
• the far past, covering past events from the day before yesterday to a year or even a few years ago,
• the remote past, which may refer to events at least five days removed from today, and more distant events, if they are not 'vivid to the narrator', and
• the perfective, which marks events 'which have already occurred and been completed during today, including last night'.

The way in which tense marking is used can be fluid. Foley (2991: 243) explains:
'The boundary between the remote past and the far past is vague and is exploited by speakers for stylistic effect. The use of remote past distances the events in time and feeling, while the far past brings them closer, enhancing them and adding a more vivid coloring'. 'The near past is that with the most clearly defined temporal limits: it marks events which occurred yesterday. If one is talking at noon about an event which occurred on the previous noon, that event will always be presented in the near past. But because of the conflict between the traditional Yimas reckoning of a day from sunset to sunset and the modern English/Tok Pisin based on sunrise to sunrise there is some confusion about last night and the night before last.'

There are, in addition, two future forms — the near future 'covers events expected to happen tomorrow', and the remote future refers to what will happen from the day after tomorrow into the indefinite future.

Amele, a Gum language from Papua New Guinea, has four verbal tense forms:
(i) today's past, (ii) yesterday's past, (iii) remote past (what happened before yesterday), and (iv) habitual past — something that often occurred in past time (Roberts 1987: 227-9):

(9) Today's past: 
Ija hu-g-a
I come-1sg-TODAY.PAST
'I came today/I have come'

Yesterday's past: 
Ija hu-g-an
I come-1sg-TODAY.PAST
'I came yesterday'

Remote past: 
Ija ho-om
I come-1sg+REMOTE.PAST
'I came'
'The changeover from one past tense to another is not rigid... Generally any event that occurred in the hours of darkness the previous night can be referred back to either in the yesterday's past tense or in the today's past tense depending on whether the speaker considers the event relates to other events that have occurred on the same day as the utterance subsequent to the event in question'. Two future forms include the 'absolute' future describing an event to happen in future time, and the 'relative' future for an event which is about happen.

**Note that** the values of each parameter can be **CATEGORICAL**, presupposing a determined choice. For instance, in a two-term gender system, a noun is assigned to either feminine or masculine gender. Or evidentiality can be visual (if I saw it) or non-visual (if I didn't). Alternatively, the values can be **GRADIENT**, and determined relatively to one another. For instance, in a many-term number system, a noun can be marked for paucal (small number) or for plural depending on the speaker's choice, rather than the exact number of objects or people. In languages with several past tenses, the value of tense can be gradient, and depend on speaker's choice. This is how tense differs from other non-spatial setting categories.

Recent past versus remote past (fused with evidentiality): Tucano (Ramirez 1997: 120)

(10) present visual: *utî-mi* '(he) is crying, cries' (visual evidentiality)
recent past: *utî-a-mi* 'he cried (a day to three days ago)
remote past: *utî-wi* he cried (more than three days ago)

We can thus see that the exact time span covered by a tense is language specific. And the choice of a tense may well depend on a speaker's perspective, and their attitude to the event they are talking about.

A special technique of tense organization: contemporary versus precontemporary (found in languages in the Maningrida subgroup in central north Australia), e.g. Burarra (Glasgow 1964, Dixon 2012: 15):

(11) now -*nga* 'contemporary within today'
    earlier today -*de* 'precontemporary within today'
    recently before today -*nga* 'contemporary before today'
    long ago -*de* 'precontemporary before today'
3.2 Relative tense in dependent clauses
Tense can be absolute and reflect the time of speech. Or it can be relative, and adjusted to the tense in which the rest of a sentence or a narrative is cast. Relative tense is especially visible in non-main clauses whose tense marking may have to be adjusted to that of the main clause. The so-called sequence of tenses in Standard English is a prime example.

Suppose John said 'I will come tomorrow'. This can be rendered as indirect speech, by John said that he would come tomorrow using a special future-in-the past.

Saying *John said that he will come tomorrow is not grammatical.

A question is: if the language has relative tense, is this a property of all or just some non-main clauses? That is, is it a property of relative clauses, complement clauses, clause-chains?

A further question: Relative tenses typically include: simultaneous, preceding and subsequent. One expects there to be fewer distinctions in relative tense than in absolute tense: is this really so?

3.3 Languages without grammatical tense
A number of languages do not have grammatical tense (e.g. Mandarin Chinese, Bahasa Indonesian, Tagalog, Lango, Yuhup and Hup, and many Oceanic languages). Various facets of the internal composition of the action, or aspects, or reality status have to be marked instead, and have temporal reference.

In the Lolovoli dialect of North-East Ambae (Oceanic), the realis forms cover past, present and definite future; and the irrealis forms refer to any future. Numerous markers specify various facets of the action. For instance, u 'telic aspect' indicates that a past event has an endpoint, and bei 'just, for the first time' indicates that the event has just occurred in the recent past (Hyslop 2001).

Toqabaqita, another Oceanic language, has an array of preverbal particles whose meanings include immediacy (covering immediate past or immediate future), completion, anteriority and many others — but no tense. Lexical time words can be used to specify when the event happened, if necessary (Lichtenberk 2008).

No language has more tense distinctions in the future than in the past. The full tense system is usually expressed in declarative clauses. Imperatives may have their own tense distinctions, typically, immediate versus future (we return to this in §8).

Or tense, aspect and modality can 'work together' as one inflectional system to express temporal relations — as in Cavineña (Guillaume 2008: 166-8):
Table 2 Tense-aspect-modality forming one system in Cavineña

<table>
<thead>
<tr>
<th>FORM AND ITS LABEL</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>-ya 'imperfective'</td>
<td>present; near future; generic; habitual; past</td>
</tr>
<tr>
<td></td>
<td>imperfective/overlapping/ongoing/progressive</td>
</tr>
<tr>
<td>-wa 'perfective'</td>
<td>immediate past; perfect/anterior</td>
</tr>
<tr>
<td>-chine 'recent past'</td>
<td>events that occurred any time from the day before as far back as 12 months ago</td>
</tr>
<tr>
<td>-kware 'remote past'</td>
<td>events that occurred earlier than a year in the past</td>
</tr>
<tr>
<td>-buke 'remote future'</td>
<td>event in remote future; event in near future if the speaker is uncertain</td>
</tr>
<tr>
<td>e-...-u 'potential'</td>
<td>future events contingent to the occurrence to another event</td>
</tr>
</tbody>
</table>

In some languages, tense marking is optional. Tense in Boumaa Fijian is not expressed at all if a statement is generic or timeless. Tense in Baniwa (Arawak) can be expressed once, at the beginning of a paragraph.

Most languages have lexical time words: today (sometimes also 'earlier today', 'later today'), yesterday, the day before yesterday (and sometimes further into the past, up to five terms as in Manambu), tomorrow, and the day after for future. In many highly synthetic languages, 'time' can be expressed through verbal suffixes referring to specific time frames and to time sequence, e.g. Ashéninca Perené -aman 'early', Paumari -kajoma 'early next morning', -biinini 'first time', -maina 'next', -jora 'ahead of time', Jarawara -mina 'in the morning, tomorrow', -iba(ha) 'do first', -mata 'short time', Tariana -kawhi 'in the morning' (Aikhenvald forthcoming). It is important to discuss these insasmuch as they relate to the usage and semantics of tenses: we return to this in §10.1.

4 Aspect: various facets of activity/state
4.1 Composition: perfective versus imperfective

Verbal aspect reflects the grammatical representation of the internal structure and composition of activity. In its narrow definition, the basic aspeactual opposition is between PERFECTIVE and IMPERFECTIVE aspect. This relates to whether the activity is regarded as having internal temporal constitution (imperfective) or not and is then viewed as a whole (perfective).

PERFECTIVE aspect implies that the event is regarded as a whole, without any account of its temporal constituency or composition. IMPERFECTIVE aspect makes explicit reference to the internal temporal constituency of the event. Aspectual systems are salient in Balto-Slavic languages, and in Greek. Perfective and imperfective aspect are contrasted in (12), from Russian:

(12) Kogda ja voshel v komnatu,
    when I come.PERFECTIVE.PAST.masc.sg into room:ACC.SG
    otec chital
    father read.IMPERFECTIVE.PAST.masc.sg
    'When I came into the room, father was reading'
The verb in the first clause presents the situation in its totality with no reference to its temporal organisation. The verb in the second clause indicates an action taking place over a certain period of time which both preceded and followed my entering the room.
In a broader perspective, 'aspect' is used to capture a number of further parameters.

### 4.2 Completion — whether the activity was completed (perfect) or continuing non-completed (imperfect)

Completion of activity involves the opposition between perfect and imperfect. Perfect refers to an activity completed before the present time, which still has relevance to it. Imperfect refers to an activity which began before the moment of speech and is still continuing. The perfect aspect suffix -wa in Cavineña refers to an action completed in the immediate past; and the imperfect suffix -ya marks ongoing and habitual actions (in the past, present or near future). Perfect aspect can also be termed completive (see (5), from Kristang). Imperfect can be referred to as incompletive, continuative, ongoing, or progressive. The continuative aspect in Chamorro indicates that an action is continuing, 'or at least is not completed', e.g. sásaga 'be staying' as opposed to the unmarked aspect saga 'stay' (Topping 1973). 'Perfect' may have additional meanings, of action relevant to the present moment (sometimes called 'anterior').

### 4.3 Phase of activity — starting, continuing, finishing

A further parameter in non-spatial setting indicates the phase of activity — whether it is beginning, continuing or finishing. Kolyma Yukaghir has an inchoative suffix meaning 'begin', e.g. leg-'eat', leg-ie- 'begin to eat' (Maslova 2003). West Greendlandic has an inchoative suffix -lir- 'begin' and a 'terminative' suffix -junar- meaning 'finish' (Fortescue 1984).

### 4.4 Boundedness (or telicity) — whether activity has an end point (telic) or not (atelic)

Telicity, or boundedness, is a further facet of representation of activity. An activity is telic when it has a specific endpoint, and atelic when it does not. Perfect aspect has telic overtones; and imperfect, durative and progressive aspects tend to be atelic. The telic aspect in the Lolovoli dialect of North-East Ambae describes an event in the past which has reached its endpoint (Hyslop 2001: 243):

(13) ngire ra=u hua u siaga
    3nonsingular 3nonsingularS=TELIC find TELIC hard

(A long, long time ago, when the first people lived on earth) they found it difficult'
4.5 Temporal extent — whether instantaneous (punctual), or extending over a period of time (durative, progressive, or continuous)

In terms of its temporal extent, an action can be PUNCTUAL: then, the activity takes place once for a brief moment. Or it can be DURATIVE. Then the activity lasts over a longer time period, e.g. Lavukaleve (Papuan, Solomon Islands; Terrill 2003: 333):

(14) ikaika a-fo'foiri-nun hano
    each 3sg.masc.O-pummell-DURATIVE then
'Each kept hitting him'

4.6 Degree — whether done a lot or a bit

DEGREE of activity may acquire special marking. Kolyma Yukaghir, a Paleo-Siberian isolate, has a suffix -s'i@ 'slightly, shortly, a little bit', e.g. morie- 'wear', morie-s'i@wear for a short time, just a little bit'. Three preverbal markers in Toqabaqita express low degree, or low intensity of an activity. Degree markers on the verb in West Greenlandic include -alug 'rather, a bit', -ngajag 'almost', -(r)piar 'really/exactly', -qqar 'barely', -qqinnar- 'exactly', and -rujug- 'a little'. Many Amazonian languages have degree of action markers on verbs, e.g. Hup 'do activity a little bit', Tariana 'a little bit', 'a lot', 'too much/excessive'.

4.7 Frequency — whether done once (semelfactive) or more than once/many time

An activity can be viewed with respect to its FREQUENCY. Amele has a habitual aspect, which describes a situation that used to be characteristic of an extended period of time, e.g. nuo-lo-i (go-HABITUAL-3sg) 'he used to go'. The iterative aspect in Amele describes successive occurrence of several instances of the same activity, and is expressed via reduplication, e.g. qu-qu (RE Duplication: ITERATIVE-hit) 'hit many times' (Roberts 1997). Semelfactive in Slave (Athapaskan: Rice 1989: 595) means 'do once', e.g. i-hwhee (SEMELFACTIVE-cut) 'cut one cut'.

4.8 Manner, including speed and ease

Further non-spatial meanings on the verb may include speed. Dyirbal has a suffix -nbal -galiy 'do it quickly'. The marker of 'rapid velocity' in Urarina, -uri, means 'do it quickly' and is also used as a marker of politeness in commands. West Greenlandic has special suffixes meaning 'be hard to VERB', 'be easy to VERB', and 'be good at VERBing'. A series of verbal clitics in Tariana describe manner of action, e.g. -su 'suddenly', -khuli 'by slipping away', -holo 'by spilling'. Elaborate sets of markers for non-spatial setting within the verb are a feature of highly synthetic languages across the world.
Telicity, phase, duration and completion may interrelate with the meanings of the verb itself. In Kolyma Yukaghir, inchoative marking usually applies to verbs which denote processes and atelic situations. Perfective aspect in Slavic languages often has overtones of telicity and completion, depending on the meaning of the verb.

5 Reality status

In many languages, an event or state can be marked for its 'reality status', as 'realis' or as 'irrealis'. Realis implies that the activity or state expressed by the verb is a fact, or something that has happened or is happening. 'Irrealis' is, in Edward Sapir's words (1930: 168), something 'unreal, i.e. either merely potential or contrary to the fact'. Irrealis may cover statements about future, and epistemic modalities. Both realis and irrealis may acquire a special marker. Alternatively, realis (and just occasionally irrealis: Awyu-Dumut languages, Nungon, Teiwa (all Papuan)) may be formally unmarked.

Elliott (2000: 81): 'Prototypically, the realis component of the category asserts that an event or a state is located in the real world, while irrealis events or states are perceived as being located in an alternative hypothetical or imaginary world, but not the real world. There are many more possibilities of what may constitute a hypothetical or imagined world that what constitutes the real world. This leads to a greater number of specific semantic contexts which are likely to attract irrealis marking, than there are semantic contexts for realis'.

The 'domain' of irrealis may cover possibility and probability, future, negative statements and directive speech acts, and also conditional clauses (hypothetical and counterfactual), apprehensives, complements of verbs of 'wanting', negative purpose clauses etc (also see Elliott 2000; and Bugenhagen 1993 for an analysis of a selection of Austronesian languages).

A relatively simple realis-irrealis distinction in Mavea (Oceanic) (Guérin 2011: 230-4):

(15a) Molres mo-tikou 50
    Molres 3sg.REALIS-marry 50
    'Molres married 50 women'

(15b) Imte i-l-maur
    wish 3sg.IRREALIS-IMPERFECTIVE-alive
    'I wish he were alive'

Reality status may be independent of a tense system. Or it may interrelate with tense. Irrealis in Yimas co-exists with an intricate tense system. It refers to events 'located outside of the continuum of real time: they must be completely timeless, in the legendary past or in the indefinite future'.
The exact meanings of realis and of irrealis are not the same across languages. In Central Pomo and in Amele, commands are cast in irrealis (as may be expected). In Maricopa, a Yuman language, imperatives are marked as realis. Negated clauses in Jamul Tiipay, from the same family, are marked for irrealis. In Mesa Grande Diegueño, another Yuman language, they are cast in realis (references in Aikhenvald 2014, Chapter 7).

The range of meanings of irrealis in Manam (Lichtenberk 1983: 188ff) is as follows:

16) sari\textsuperscript{Ni}-tú/a \textsuperscript{go}-palála 
\textsuperscript{Future} near-intensifier 2sg.IRREALIS-be.bald
You will be bald very soon

17) mása taún-lo tágo \textsuperscript{m}-lá/ó 
\textsuperscript{Negative future} indefinite.irrealis town-to NEG 1sgIRREALIS-go
'I will not go to town'

18) nátu móita \textsuperscript{Ni}-te-ó 
\textsuperscript{Commands, wishes and warnings} child knife 3sgIRREALIS-find-3sgOBJECT
'Let the child find the knife!'

19) éwa \textsuperscript{go}-té=a-te-ó 
\textsuperscript{Lest} \textsuperscript{Ni}-zimbóro tá/ana
fire 2sgIRREALIS-REDUPLICATION-look-3sgOBJECT 3sgIRREALIS-darken 'LEST'
'Look after the fire so that it doesn't go out (lest it should go out)'

20) \textsuperscript{go}-púra maraú-gu anúnu-\textsuperscript{a}-ó 
\textsuperscript{Counterfactual events and wishes} 2sg.IRREALIS-come sister-1sg picture-prod-3sg
m-iti/i\textsuperscript{Ni}/o
1sgIRREALIS-show-2sgOBJECT
'If you had come (yesterday), I would have shown you my sister's picture'

21) éwa ábe \textsuperscript{Nh}-máte /ána 
\textsuperscript{Imminent events} fire already 3sgIRREALIS-die PROSPECTIVE
'The fire is about to die'

22) móede \textsuperscript{Nh}-té-ó \textsuperscript{te}/e-ó \textsuperscript{tanépwa \textsuperscript{te}/e-ó} \textsuperscript{Customary, habitual activities}
chiefly.woman one-3sg chief one-3sg
\textsuperscript{Nh}-té-ó-be \textsuperscript{Nh}-tamíN
3sg.IRREALIS-see-3sgOBJECT-and 3sgIRREALIS-urinate
\textsuperscript{Nh}-tamin-ria-be tamimi-ó-na-lo ba\textsuperscript{Nh}
3sgIRREALIS-urinate-down-and urine-3sg-BUFFER-in taro
\textsuperscript{Nh}-dúla
3sgIRREALIS-sprout
'She (a mythical woman) would see a chiefly woman and a chief, she would urinate, she would urinate down, and out of her urine a taro would sprout' (when describing the origin of the taro, the same process was repeated in each village the mythical woman visited).
In some languages, including Tamambo and Manam, irrealis forms have habitual overtones. This usage echoes Brinton's (1988: 140-1) discussion of English aspectual categories, and her observation that 'habitual aspect [ as in he would get drunk every night - AA] has similarities to epistemic modality because a present habit is presumed to continue into the future; the statement of habit is a kind of prediction'.

6 Modality, and attitude to knowledge
A further facet of non-spatial setting involves the actuality of the event in terms of its certainty, speakers' attitude towards its possibility, probability, and their obligation or ability to perform it. These meanings are captured under the label of 'modality'. We distinguish:

A. Epistemic modalities. An epistemic modality covers degree of certainty, as does the clitic =ni 'maybe' in Cavineña. Potential modality in Finnish (marked with the suffix -ne-) indicates probability, e.g. Heikki ottanee sen (Heikki take:POTENTIAL:3sg it:ACC) 'Heikki may (or can) take it'. The suffix -hat/het- in Hungarian may express possibility, permission or ability: a form like ír-hat (write-POTENTIAL.3sg) may mean 'he can write', 'it is possible for him to write', 'he is allowed to write' and 'he is able to write'.

B. Obligation (should, ought to), necessity (must), ability, prediction. West Greenlandic has several suffixes expressing obligation, e.g. miri-niru-saríaq-putit (drink-more-MUST-2sgINDICATIVE) 'You must drink more!'. (These are also sometimes referred to as 'deontic' modalities).

C. Attitudinal modalities: wanting, intention, frustration, apprehensive (warning). Desiderative modality expresses the meaning of 'wanting', e.g. Manambu ya-kE (come -DESIDERATIVE) 'want to come'. Lakhota has three optative forms: one expresses 'probability of fulfilment of wish', another one expresses 'improbability of fulfilment', and a further one marks a wish which cannot be fulfilled. Intentional modality expresses the speaker's intention and planning, as in West Greenlandic kati-ssamaar '(get married-INTENTIONAL) 'plan to get married'.

The frustrative modality covers actions done 'in vain', that is, failing to achieve the result. Frustrative in Tariana is expressed through the suffix -tha. The form nu-émháni-tha-na (1sg-walk-FRUSTRATIVE-REMOTE.PAST.VISUAL) means 'I walked in vain'. This is a feature of a number of Amazonian, Australian and New Guinea languages (Overall forthcoming).
Additional parameters of non-spatial setting to do with attitude to knowledge and reaction to it include:

- **MIRATIVITY** (or grammaticalized surprise, unexpected knowledge, revelation, or 'expectation of knowledge', very different from any other category) (see Aikhenvald 2012b, DeLancey 2012, Adelaar 2013). Chechen, a North-East Caucasian language, has a 'mirative' suffix -q added to the verb, if 'the situation is unexpected and surprising for the speaker'.

- **POINT OF VIEW** (as in Oksapmin), and perhaps more: especially in languages with very rich verbal morphology. Urarina has a verbal modal clitic expressing 'warning', and another one expressing reassurance. The clitic =shama in Cavineña marks 'pity' a speaker may feel for someone.

### 7 Evidentiality

In every language one can say *how* one knows what one is talking about. A quarter of the languages of the world have grammaticalised information source. They have 'evidentiality' as a grammatical category. In the same way as 'tense' refers to closed grammatical systems which grammaticalise the expression of time, 'grammatical evidentiality' refers to a closed set of obligatory choices of marking information source. The size of systems varies (see Aikhenvald 2004, 2006, 2015).

Many languages have just a marker for reported information — that is, what one knows from being told by someone else, e.g. Estonian:

(23) Tema on arst  
he/she is doctor  
*a statement, no information source provided*  
'He/she is a doctor'

(24) Tema olevat arst  
he/she is:REPORTED doctor  
*a statement based on reported information, may have overtones of doubt*  
'He/she is reported to be a doctor'

In Língua Geral, a Tupí-Guaraní language of north-west Amazonia, adding a particle paá to a statement indicates that you got the information from hearsay, or from someone else. Quechua languages distinguish three information sources: direct evidence, conjecture and report.

Tariana has five evidentials marked on the verb. Evidentials are partly fused with tense. If I see José play football, I will say:

(25) José iri-da  
José sap-CLASSIFIER.ROUND  
'José is playing football' (visual)

(26) di-manika=naka  
3sgnf-play=PRESENT.VISUAL

I will say (26) using the non-visual evidential if I can hear the noise, but cannot see him:
(26) José irida di-manika=mahka
José sap-CLASSIFIER.ROUND 3sgnf-play=RECENT.PAST.NON.VIS
'José is playing football' (nonvisual)

If all I see is that José's football boots are gone and so is the ball, I will use the inferential:

(27) José iri-da di-manika=nihka
José sap-CLASSIFIER.ROUND 3sgnf-play=RECENT.PAST.INFERRED
'José is playing football' (inferred)

If it is Sunday and José is not home, the thing to say is 'José is playing=sika' since my statement is based on the assumption and general knowledge that José usually plays football on Sundays:

(28) José iri-da di-manika=sika
José sap-CLASSIFIER.ROUND 3sgnf-play=RECENT.PAST.ASSUMED
'José is playing football' (assumed)

And if the information was reported to me by someone else, I will say 'José is playing=pidaka', using the reported marker.

(29) José iri-da di-manika=pidaka
José sap-CLASSIFIER.ROUND 3sgnf-play=RECENT.PAST.REPORTED
'José is playing football' (reported)

Omitting an evidential results in an ungrammatical and highly unnatural sentence.

Table 3 Recurrent meanings in evidentiality systems across the world (Aikhenvald 2004, 2015)

I. VISUAL covers evidence acquired through seeing.
II. SENSORY covers evidence through hearing, and is typically extended to smell and taste, and sometimes also touch.
III. INFERENCE based on visible or tangible evidence or result.
IV. ASSUMPTION based on evidence other than visible results: this may include logical reasoning, conjecture or common sense.
V. REPORTED, for reported information with no reference to who it was reported by.
VI. QUOTATIVE, for reported information with an overt reference to the quoted source.

Evidentiality does not bear any straightforward relationship to truth, the validity of a statement or the speaker's responsibility. The 'truth value' of an evidential may be different from that of the verb in its clause. Evidentials can be manipulated to tell a lie: one can give a correct information source and wrong information, as in saying 'He is dead-reported', when you were told that he is alive, or correct information and wrong information source, as in saying 'He is alive-visual', when in fact you were told that he is alive, but did not see this. The ways in which semantic extensions of evidentials overlap with modalities and such meanings as probability or possibility depend on the system, and on the semantics...
of each individual evidential. In many languages, including Quechua, Shipibo-Konibo, Tariana and Abkhaz, markers of modality and of irrealis can occur in conjunction with evidentials on one verb or in one clause. This shows that these are all different categories.

The maximal number of evidentials is distinguished in statements. The only evidential possible in commands is reported, to express the command on behalf of someone else: 'eat-reported!' means 'eat following someone's command!'. The text's genre may determine the choice of an evidential. Traditional stories are typically cast in the reported evidential. Evidentials can be manipulated in discourse as a stylistic device. Switching from a reported to a direct (or visual) evidential may imply that the speaker had participated in the event, and is confident of what they are saying. Evidentiality is intertwined with conventionalised attitudes to information and precision in stating its source.

8 Parameters of non-spatial setting: correlations and dependencies

Different parameters of non-spatial setting can depend on each other (cf. Aikhenvald and Dixon 2011).

- Choices made in aspect (perfective/imperfective) may determine choices made in tense.

  In Russian three tenses — past, present and future — are distinguished in imperfective aspect, but only two — past and future — in perfective.

- Choices made in aspect or in tense may determine choices made in evidentiality.

  In Hinuq, Tatar, Jarawara and Matses evidentiality is only distinguished in past tenses. The choices made in the tense system thus determine the choices made in the system of evidentials. Tucanoan languages and Tariana have no evidentiality in future tenses; in Tariana five evidentiality distinctions (visual, non-visual, inferred, assumed and reported) are made in the past tenses, and only three (visual, non-visual and reported) in the present tense. In Georgian evidentiality is distinguished only in perfective aspect (a summary is in Aikhenvald and Dixon 2011; Aikhenvald 2015).

- Or choices made within other categories can dictate the choices in non-spatial setting:

  - Choices made in sentence type determine choices in non-spatial setting:

    In imperative sentences, tense systems include:

    (i) immediate imperative ('now') versus non-immediate ('later'), as in Tucano:

    (30)  ba'á-ya
    eat-IMPV
    'Eat!'

    (31)  ba'á-apa
    eat-FUTURE.IMPV
    'Eat (later)'

(ii) immediate versus near future and remote future: A simple 'root' imperative in Koasati, a Muskogean language from Louisiana, has the force of an immediate command (Kimball 1991: 263):

(32) lakáwwi-ø-DEL
    LIFT-2sgIMPV-PHRASE.TERMINAL.MARKER
    'Lift it!'

Koasati is unusual in having two delayed imperatives: one marked with - $\text{v}_7\text{h}$ meaning 'do later on' (33), and the other one with - $\text{v}_7\text{h}ah$ meaning 'do much later on' (34). The markers are suffixed to the simple imperative form:

(33) am-awí:ci-ø-$\text{v}_7\text{h}$
    1sgDAT-HELP-2sgIMPV-DELAY
    'Help me later!'

(34) am-hoponi:-$\text{v}_7\text{h}ah$
    1sgDAT-COOK:IMPV-LONG.DELAY
    'Cook it for me a lot later!'

Koasati has numerous modal markers referring to actions hoped for by the speaker (including intent, and immediate intent: Kimball 1991:180-3). The two future meanings in imperatives are somewhat similar to these two intent markers.

• Choices made in polarity (negation) may dictate choices in non-spatial setting. In Swahili, the distinction between present, progressive and past is neutralised under negation (the verb will take the negative prefix $hu$ and a special form of tense-aspect marker):

(35) Present progressive past perfect future
     Positive polarity     -a-    -na-    -li-    me-    -ta-
     negative polarity (prefix $hu$-)     -si-    -ku-    -ta-  

There may be fewer evidentiality choices in negative clauses than in positive ones; that is, certain evidentiality contrasts may be neutralised in the negative, just as certain tense and aspect choices are, in some languages. In Myky, an isolate from Brazilian Amazonia (Monserrat and Dixon 2003), no evidentials at all can be distinguished if the clause is negative. In the Luchuan dialect of
Ryukyan (Arakaki 2013: 159), the direct evidential is not used in nonpast tense in negative clauses. This is an instance of a more complex dependency POLARITY/TENSE > EVIDENTIALITY.

9 Scope of non-spatial setting

The scope of non-spatial setting can be a clause, or it can be a Noun Phrase. In just a few languages, including Jarawara and Ashéninca Perené, NPs can take verbal morphology which will have the NP scope, cf. Jarawara (Dixon 2004: 308). In (36), the time reference, aspect and information source for the noun ('their past reported villages') and for the predicate ('were there') are different:

(36) [[[mee tabori]-mete-mone] jokana]s
    3non.sg home.fem-FAR.PAST.nonfem-REP.fem real
    boto  joro ni-kimi-ne-ke
    clearing(fem) sit(du.S) AUX-TWO-CONT.fem-DECLfem

'The two clearings of their [reported past villages] were there'

And in (37), an irrealis marker is used on 'my spouse': the noun is within the scope of irrealis, and the verb has independent and different values for aspect and reality status:

(37) [oko jibotee]-ne  o-katomi-ne
    1sgPoss spouse-IRR.fem 1sgA-fight.with-CONT.fem

'I fight with (and kill) one who could have been my wife'

In many Amazonian and some Australian languages, there is just a nominal past and a nominal future (nominal present is formally unmarked). An example from Kamaurirá, a Tupí-Guaraní language from the Upper Xingu (Seki 2000: 111-12, 305-6; Aikhenvald 2012a: 158-63):

(38a) je=r-emi'u-her
    1sg=REL-food-NOMINAL.PAST 'my former food, food already eaten'

(38b) je=r-emi'u-ram
    1sg=REL-food-NOMINAL.FUTURE 'my future food, to be eaten'

(38c) je=r-emi'u-her-am
    1sg=REL-food-NOMINAL.PAST-NOMINAL.FUTURE 'what was going to be my former food'

There are even more complicated systems in Amazonian languages, but:

Systems of nominal tense (or aspect, or reality status....) appear to be absent from PNG languages!
10 Further issues

10.1 Expression of non-spatial setting through other means

• **Non-spatial setting** (and especially time and information source) can be expressed lexically: see end of §3 above, and Dixon 2012: 20-21, on five groups of time words: duration, frequency, specific time spans, temporal shifters, and 'expectation' (already, not yet).

  Time can also be expressed through nominal demonstratives, e.g. Manambu:

  \[(39)\] \(kE\text{wik}\) (DEM.PROX+fem.sg week) 'this week now'
  \(kE\text{El}-\text{ay}\ \text{wik}\) (DEM.PROX-fem.sg-DIST week) 'next week'
  \(a\ \text{wik}\) (DEM.DIST+fem.sg week) 'last week'
  \(a-l-\text{ay}\ \text{wik}\) (DEM.DIST-fem.sg-DIST week) 'week before last'
  \(a-d-\text{ay}\text{nabi}\) (DEM.DIST-masc.sg-DIST year) 'year before last'.

  In **Nungon**, nominal demonstratives with elevationals may refer to time: 'past' is downhill; future is 'uphill'; present is unmarked as for elevation and referred to as 'here' (from 2013) (Sarvasy 2013):

  \[(40)\] \(\text{yara} \ \text{om-u}\) 2011, 2012
  year downhill-DISTAL
  \(\text{yara} \ \text{ng-o}\) 2013 (current)
  year HERE-PROX
  \(\text{yara} \ \text{on-o}\) 2014
  year UPHILL-PROX
  \(\text{yara} \ \text{on-u}\) 2015
  year UPHILL-DIST

  **Spatial terms** may have temporal reference:

  \[(41)\] The Nominalization workshop is behind us
  \[(42)\] The new Global workshop is up ahead

  Time can be viewed as a 'slope'. In Motuna (Papuan, Bougainville: Onishi 1994: 81) *koto* 'up' means 'in the future' and *koho* 'down' means 'in the past' (see other examples in Dixon 2012: 19).

10.2 More?

• Cultural correlates for non-spatial setting: attempts to link evidentiality with cultural requirements to be precise; others are yet to be ascertained

• Grammaticalization and origins of markers — e.g. nonvisual evidential from the verb 'hear'; frustrative from a verb 'do incompletely', completive aspect from 'finish'…

• How semantic distinctions within non-spatial setting get spread as a result of areal diffusion: for instance, the Tariana tense-evidentiality system in (25-29) is a mirror image of Tucanoan.
• Discourse use: change in non-spatial setting to make narrative more vivid; possible omission of non-spatial setting markers — and more?

And now to the checklist of points.

Abbreviations
A - transitive subject
ABS - absolute
ACC - accusative
AUX - auxiliary
CL - clause
COMPL.CL - complement clause
CONT - continuous
DECL - declarative
DEM.DIST - demonstrative distal
DEM.PROX - demonstrative proximal
DIST - distance
du - dual
dem - feminine
HAB - habitual
IMPV - imperative
IRR - irrealis
LOC - locative
masc - masculine;
NEG - negation;
onfem - nonfeminine
O - object
p - person
PERF - perfective;
pl - plural
Poss - possessive;
prod - product
REL - relative
REP - reported
S - intransitive subject;
sg - singular
sgnf - singular nonfeminine

References


Onishi, Masayuki. 1994. 'A grammar of Motuna'. PhD thesis, ANU.

Overall, Simon. Forthcoming. 'A typology of frustrative'.


Sarvasy, Hannah. 2013. 'Demonstratives in Nungon', Seminar at LCRC.


