

Nominal Tense as Modifiers of Resource Situations

Kimberly Johnson

1. Introduction

In a few languages, temporal morphology can affix to nouns where it contributes independently to the meaning of the noun (Nordlinger & Sadler 2004). Cross-linguistically, these Nominal Temporal Morphemes (NTMs) give rise to interpretations which fall into two main categories.¹ The first category includes NTMs with Change of State interpretations. These NTMs place the nominal predication time in the past and lead to the inference that the nominal predicate (or possessive relation) no longer holds of the entity. Some well known examples of these are found in Mbyá Guaraní (Thomas 2014) in ((1)) and Halkomelem (Wiltschko 2003) in ((3)).

- (1) A-ikuaa peteĩ opyguá-**kue**. Mbyá Guaraní
1-know one priest-**PST**
'I know/knew one **ex**-priest.' (Thomas 2014: 397)
- (2) te-l xéltel-**elh** Halkomelem
DET-1SG.POSS pencil-**PST**
'my **former** pencil' (Wiltschko 2003: 665, attributed to Burton 1997)

In both of the above examples, using the NTM leads to an obligatory change of state inference. The Guaraní NTM *-kue* in ((1)) indicates that the person in question no longer has the property of being a priest. The Halkomelem NTM *-elh* in ((3)) indicates that the possessive relation between the speaker and their pencil has ceased to hold.

A second category of interpretations are what I call Discourse Related interpretations. This type of NTM does not clearly modify the nominal predication time. Instead, the NTM provides a relevant past time for the identification of the entity. These interpretations are compatible with the nominal predicate still holding of the entity at the utterance time. The best known example of this type of NTM is the Somali past tensed definite determiner *-kii* (*-dii* or *-gii*) (Lecarme 1996, 1999, 2008) in ((2)). This type of NTM is also found in Kipsigis, a Nilotic language (Kouneli & Özyıldız 2018). Kipsigis' NTMs are graded; the recent past is seen in example ((4)).

- (3) ardyáy-**dii** wáy joogaan Somali
students-**DET.F.PST** FOC.3PL be.present
'The students (**I told you about**) are present.' (Lecarme 1999: 335)

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¹ For reasons of space, I do not discuss Decessive meanings which typically receive translations similar to English *late*. I also leave future NTMs out of my discussion though they are found notably in the Guaraní languages, see Tonhauser (2007) for example.

	Discourse Related	Change of State
P1	that/the N from this morning/last night	that/the (recently) former N
P2	that/the N from yesterday/earlier	that/the former N
P3	-not used on nominals-	
P4	✗	a/the former N

Table 1: Interpretations of Mvskoke NTMs

- (4) Kì-boot-e ngoog-i-**kaan** Kipsigis
 p3-bark-IPFV dog-DEM-P1
 ‘That dog (**from earlier today**) was barking (long ago).’ (Kouneli & Özyıldız 2018)

Discourse Related interpretations are more varied with this type of NTM making reference to the time the entity was spoken about, in ((2)), or the time the entity was seen, in ((4)).

Mvskoke ([məsko:gi], aka Creek, Muskogee, Seminole) has three past tenses that can affix to nouns.² When Mvskoke’s recent past (P1), middle past (P2) and remote past (P4) tenses appear with a noun, they differ in both the interpretations they can receive and the definiteness of the NP they combine with. This is summarize in Table 1.³ As Table 1 shows, P1 and P2 allow for both Discourse Related and Change of State interpretations, and are restricted to definite NP. P4, on the other hand, only receives Change of State interpretations, but can occur with either definite or indefinite NPs. In this paper I address two central puzzles.⁴ First, all three NTMs receive Change of State interpretations, but only P1 and P2 receive Discourse Related interpretations. Second, all three NTMs can combine with definite NPs, but only P4 is compatible with indefinite NPs.

In what follows, I propose an analysis that makes sense of both of these puzzles. I show that the Change of State inferences cannot be derived in the same way for P1/P2 as for P4. This motivates my proposal that Mvskoke NTMs appear in two locations in a noun phrase. The lower position hosts P4 as a tense operator, where the change of state inference is derived as laid out for Mbyá Guaraní by Thomas (2014). The higher position is occupied by P1 and P2 where they modify the resource situation of a strong D. This position accounts for the definiteness restriction of P1/P2 and I provide a novel derivation for the change of state inference of these tenses that draws on insights from Tonhauser (2007).

Section 2 provides background on the Mvskoke tenses and the puzzles of their use in the nominal domain. Section 3 presents an account for P4 using Thomas’ (2014) system. Some challenges for extending the system to P1 and P2 are discussed. Section 4 motivates an account of P1 and P2 as resource situation modifiers and demonstrates how the Change of State and Discourse Related interpretations are derived. I conclude in section 5 with some predictions of the account for Mvskoke and for the typology of NTMs.

2. Background on Mvskoke Nominal Tenses

Mvskoke has four (previously five) “graded” past tenses, which indicate how far in the past an event occurred (Haas 1940; Martin 2010; a.o.). It is widely accepted that each tense covers an interval of time increasingly remote from the present, as seen in Table 2.

Tense	Morpheme	Temporal Interval
P1	-is /-eys/	today – last night
P2	-vnk /-ánk/	yesterday – 1 year
P3	-emvt /-imát/	1 year – 20 years
P4	-vtē /-ati:/	20 years – ancient ⁵

Table 2: Widely Accepted Intervals for Mvskoke Past Tenses

² Mvskoke is an endangered Muskogean language spoken by roughly 600 people in Oklahoma and Florida. All data in this paper come from speakers of Oklahoma dialects.

³ For reasons of space, I omit data on Decessive interpretations. However, it is worthy of note that the most common interpretation of P4 is a decessive interpretation, indicating the individual is deceased.

⁴ The absence of P3 in the nominal domain is a puzzle I leave for future investigation.

As first documented by Martin (2010), three of Mvskoke’s past tenses can be affixed to nouns: P1, P2, and P4. Nominal uses of P3 are notably absent in texts and unacceptable in elicitation. The tenses take slightly different phonological forms when they appear on nouns, as illustrated in Table 3. In contrast to the verbal domain where tense marking is obligatory, NTMs are entirely optional in Mvskoke. They are, in fact, nearly absent in the existing documentation of texts and very rare in interviews.⁶

Appearing on Verbs		Appearing on Nouns
P1	-eys	-eysí:
P2	-ánk	-ankí:
P3	-imát	–
P4	-atí:	-tá:ti:

Table 3: Mvskoke Verbal and Nominal Tense Morphology.

2.1. Interpretations of the NTMs

As outlined in the introduction, there are several puzzling asymmetries between P1 and P2 on one hand and P4 on the other. First, not all NTMs in Mvskoke receive both a Change of State and a Discourse Related interpretation. All three NTMs are able to receive interpretations which are accompanied by a change of state inference indicating that the entity no longer has the NP property. However, only P1 and P2 additionally receive discourse related meanings that indicate a *previous shared experience* or *previous mention* of the intended referent of the NP.

I illustrate with P2 and P4. (The Change of State interpretation of P1 is available, but difficult to access given the restricted temporal interval associated with P1.) In (5), when P2 is affixed to the NP *mvhakov-cuko ohhēcv*, the NP can be interpreted either as ‘the former principal’ or ‘the principal (that you and I met at some P2-time).’⁷

- (5) Mvhakov-cuko ohhēcv **vnkē** vtokē monkvt os.
 maha:ka-cóko oh-hí:ca =**ankí:** ato:tk-í: mónka-t ô:-s.
 school-house LOC-SEE.NMLZ =**P2** work.IPFV-DUR still-SS be.PFV-IND
 ‘The **former** principal/ That principal (**that we met before**) is still working.’
 a. ✓Change of State Context: The principal retired, but he is still working in his retirement (though not as a principal).
 b. ✓Discourse Related Context: A and B met the principal several months ago. A recently learned he is still the principal. B doesn’t know this and asks: “Who is the principal now?”
 (RMM,LT-Mus-12/21)

When P4 is affixed to the same NP, it can only receive a Change of State interpretation. P4 cannot indicate a time in the remote past at which the interlocutors had a shared experience of the entity.

⁵ This tense is known in the Muskogean literature as Past 5. Past 4 in Muskogean literature is the now defunct remote tense.

⁶ Although I remain agnostic in the talk about whether these markers technically behave as “tenses” in the nominal domain, I do believe Mvskoke NTMs provide the best evidence to date for true nominal “tense” as defined by Tonhauser (2006, 2007, 2020). See Johnson 2022 for discussion.

⁷ Mvskoke examples come from the author’s fieldwork unless otherwise indicated. The first line of each example is in the practical Seminole orthography; the second line is a phonemic transcription following Martin’s (2011) conventions. The glosses I use are as follows: ACC accusative; AG agent argument; CAUS causative; COMM commitative; COMP complementizer; DAT dative argument/ alienable possession; DECL declarative particle; DEM demonstrative; DET determiner; DIM diminutive; DIR directional; DS different subject; DUR durative; F feminine (in Somali examples); FOC focus marker; GPL group plural; IND indicative; INST instrumental; IPFV imperfective aspect; LOC locative; NEG negation; NOM nominative; M masculine (in Somali Examples); NMLZ nominalizer; P1 recent past/ Past 1; P2 intermediate past/ Past 2; P3 distant past/ Past 3; P4 remote past/ Past 4; PASS impersonal passive; PAT patient argument/ inalienable possession; PFV perfective aspect; PL plural; POSS possessive; PST past; SG singular; SS same subject.

- (6) Mvhakv-cuko ohhēcv **tatē** vtotkē monkvt os.
 maha:ka-cóko oh-hí:ca =**tá:ti**: ato:tk-í: mónka-t ô:-s.
 school-house LOC-see.NMLZ =**P4** work.IPFV-DUR still-SS be.PFV-IND
 ‘The **former** principal/ #That principal (**that we knew long ago**) is still working.’
 a. ✓Change of State Context: The principal retired, but he is still working in his retirement (though not as a principal).
 b. ✗Discourse Related Context: A and B knew the principal a long time ago. A recently learned that he is still the principal. B doesn’t know this and asks, “Who’s the principal now?”
 (RMM,LT-Mus-10/21 & 12/21)

Second, although a P4-marked nominal is compatible with indefinites, P1- and P2-marked nominals are restricted to definites.

- (7) *P4/P2 Indefinite Change of State Context*: A and B are at the Senior Center organizing a hymn singing event. Everyone present have stepped down from their roles in the community. A wants to see if anyone present is a former women’s leader to ask them to lead a song. B asks *Who are you looking for?*

Hoktvke enhomahtv **tatē** hopot owis.
 hokt-akí in-homáhta =**tá:ti**: hopó:-t o:w-êy-s
 woman-PL DAT-leader =**P4** look.for.IPFV-SS be.IPFV-1SG.AG-IND
 ‘I’m looking for a former women’s leader.’

Speaker Comment: You may or may not know who I’m looking for.

#Hoktvke enhomahtv **vnkē** hopot owis.
 hokt-akí in-homáhta =**ankí**: hopó:-t o:w-êy-s
 woman-PL DAT-leader =**P2** look.for.IPFV-SS be.IPFV-1SG.AG-IND
 I’m looking for that former women’s leader.

Speaker Comment: This is the one women’s leader that you and I know. (RMM-Mus-06/21)

2.2. Non-cancellation of Change of State inferences

A central question in the study of NTMs with change of state interpretations is whether the change of state inference is semantic or pragmatic. One diagnostic that targets this distinction is to attempt to cancel the inference. There are three ways to cancel change of state or cessation inferences in the verbal domain (Musan 1997, Altshuler & Scharzschild 2013, Cable 2017, inter alia.). For example, the English past stative sentence *Sam was the school principal* generally invites the inference that Sam is no longer the school principal. To cancel this, one can include a statement denying the change, e.g. *Sam was the school principal, and he still is*. One can place the sentence in a context with a salient past Topic Time, e.g. *A: Did this school have a good principal last year?, B: Yes. Sam was the school principal*. Finally, one can make an explicit statement of ignorance about whether the state ceased to hold of Sam, e.g. *Sam was the school principal, but I don’t know if he still is*.

If a change of state or cessation inference is hard to cancel, it can usually be cancelled by a statement of ignorance (see Cable (2017) on Tlingit). However, when the Change of State meaning of Mvskoke NTMs is accessed, it is not cancellable by any of the three means above. I illustrate in (8) and (9) below with a statement of ignorance.

- (8) Context: Imagine you know that the man who was the pastor of Cedar Creek church is a fluent Mvskoke speaker, but it's been so long since you spoke to him, you aren't sure he's still their pastor.

Vcenv Hvcce emerkenkv (#**vnkē**) Maskoke hērēn punayet omvnks.
 acína hácci im-iłkináka (#=**ankí:**) ma:skó:ki hīⁿıi:-n pona:y-ít ô:m-ánk-s
 cedar creek 3.DAT-preacher =**P2** Mvskoke good.INT-ACC speak.IPFV-SS be.PFV-P2-IND
 'The (former) pastor of Cedar Creek spoke Mvskoke very well.'

Momis emerkenkv emonkv ont omat kerrvkt os.
 mō:meys im-iłkináka imōnka ó:n-t o:m-â:t kiłł-áko-t ô:-s
 however 3.DAT-preacher be.still.PFV be.IPFV-SS be.IPFV-COMP know-1SG.AG.NEG-SS be.PFV-IND
 'However, I don't know if he's still their pastor.'

Speaker Comment: If you use *vnkē* [P2], then you know he's not their preacher anymore.

(RMM-Mus-08/21)

- (9) Context: The principal of a certain school is a really good man and Sue knows him and likes him. In May he mentioned that he might be stepping down over the summer. Sue hasn't heard if he stepped down or not, but she hopes he will continue to be the principal. Sue's friend asks, "Does this school have a good principal?" Sue says (a) then (b).

Mvhakv-cuko ohhēcv (# **tatē**) este hērēt owvnks.
 maha:ka-cóko oh-hí:ca (# =**tá:ti:**) ísti hīⁿıi:-t ô:w-ánk-s
 school-house LOC-see.NMLZ (# =**P4**) person good.INT-SS be.PFV-P2-IND
 'The former school principal was a good man.'

Mowis mvhakv-cuko ohhēcv vtotkē monkat owat
 mō:weys maha:ka-cóko oh-hí:ca ato:tk-í: mōnk-a:t o:w-â:t
 however school-house LOC-see.NMLZ work.PFV-DUR be.still.IPFV-DUR-COMP.SS be.IPFV-COMP.SS
 kerrvkt os.
 kiłł-áko:-t ô:-s
 know-1SG.AG.NEG-SS be.PFV-IND

'However, I don't know if he is still working as the school principal.'

Speaker Comment: With *tatē* (P4), (a) is a good sentence, but the logic breaks down when you say (b) because the first sentence says he's a former principal. (RMM-Mus-10/21)

In each example, the statement of ignorance in the (b) example makes the NTM infelicitous on the NP. These judgments support viewing the Change of State inference as a semantic entailment, instead of a pragmatic implicature.

3. Deriving Change of State for Mvskoke NTMs

The non-cancellability of the change of state inference supports a view in which it is part of the semantics of the NTMs. There are puzzles for this conclusion however. First, although non-cancellable in the nominal domain, P1, P2, and P4 have cancellable cessation implicatures in the verbal domain. Secondly, nominal P1 and P2, on their discourse related meanings, do not entail change of state.

A similar state of affairs is found with Mbyá Guaraní *-kue*. This NTM has i) a cancellable cessation implicature on verbs and ii) a non-cancellable cessation implicature on nouns. On Thomas' (2014) pragmatic account, *-kue* is a past tense operator which gives rise to a cessation implicature due to competition with a tenseless alternative. However, due to independent properties of NPs, the cessation implicature accompanying nominal *-kue* is obligatory. Below, I demonstrate that Thomas' (2014) account works for P4, but cannot be extended to account for P1 and P2.

3.1. Accounting for P4

Following Thomas (2014), I assume that a DP with P4, such as *mvhakov-cuko ohhēcv tatē* ‘school principle P4,’ has the structure illustrated in (10).

$$(10) \quad [_{\text{DP}} \emptyset_{\text{def}} [_{\text{XP}} \lambda_1 (\text{EXH}) [_{\text{TP}} s_2 \text{P4} [_{\text{NP}} x_1 \text{school principal}]]]]$$

In this structure, P4 is a past tense operator that combines with a noun who’s entity argument has been abstracted over. I use situation semantics to facilitate a unified approach to NTMs. I give P4 the semantics in (11) in which it introduces a temporal precedence relation between a situation introduced by P4 and the topic situation of the NP.

$$(11) \quad \text{Semantics for P4} \\ \llbracket \text{P4} \rrbracket^{g,w} = [\lambda P_{\langle st \rangle}. [\lambda s. \exists s'. \tau(s') < \tau(s) \wedge P(s')=T]]$$

The resulting TP combines with the EXHAUST operator, which is responsible for generating scalar implicatures (Magri 2009, o.a.). The EXHAUST operator generates a set of structural alternatives in (12) and compares the structure with P4 to a structure where the NP is evaluated at the nominal topic situation.

$$(12) \quad \text{Relevance Set} \\ \text{a. } [_{\text{TP}} s_2 [_{\text{T}} \text{P4}] [_{\text{NP}} x_1]] \\ \llbracket (12\text{a}) \rrbracket^{g,w} = \exists s'. \tau(s') < \tau(g(2)) \wedge \text{school-principal}(g(1))(s') \\ \text{b. } [_{\text{NP}} s_2 [x_1 \text{school-principal}]] \\ \llbracket (12\text{b}) \rrbracket^{g,w} = \text{school-principal}(g(1))(g(2))$$

The operator then adds the negation of the tenseless alternative to the denotation of the NP, outputting the content of the cessation implicature, (13a).

$$(13) \quad \llbracket [\text{EXH TP}] \rrbracket^{g,w} = \exists s'. \tau(s') < \tau(g(2)) \wedge \text{school-principal}(g(1))(s') \\ \wedge \neg \text{school-principal}(g(1))(g(2))$$

$$(14) \quad \llbracket \text{DP} \rrbracket^{g,w} = \iota x. \exists s'. \tau(s') < \tau(g(2)) \wedge \text{school-principal}(g(1))(s') \wedge \neg \text{school-principal}(g(1))(g(2)) \\ \text{only defined if } \exists! x. x \in C \wedge \exists s'. \tau(s') < \tau(g(2)) \wedge \text{school-principal}(x)(s') \\ \wedge \neg \text{school-principal}(x)(g(2))$$

The entire DP has the semantics in (13b). (13b) refers to the unique individual x such that there is a situation temporally located before $g(2)$ when x was a principal and x is not a principal in $g(2)$. It will be defined only if there is exactly one individual x in the context for which there is a situation temporally located before $g(2)$ when x was a principal and x isn’t a principal in $g(2)$.

3.2. Extending to P1/P2

These semantics correctly predict that P4 is accompanied by an obligatory cessation implicature, which is nonetheless not semantically encoded. Additionally, because of its position, P4 can appear with an NP regardless of the semantics of D. Thomas’ system captures P4 quite well, however I argue that it makes several wrong predictions regarding P1/P2.

First, this account predicts that P1/P2 should also be able to appear with indefinite DPs. This prediction was shown to be inaccurate by example ((7)). Secondly, the account predicts that there should be competition between P1/P2 and P4. If P1, P2, and P4 occupy the same position, a P4-marked NP’s alternatives should include not only a tenseless alternative, but also a P1 alternative and a P2 alternative. Consequently, a P4-tensed nominal should have a temporal remoteness implicature in addition to a cessation implicature. I illustrate this in (15).⁸

⁸ I abstract away from the temporal intervals associated with P1 and P2 for now, but formalize them in the next section.

- (15) $\llbracket [\text{EXH TP}(P4)] \rrbracket^{g,w} = \exists s'. \tau(s') < \tau(g(2)) \wedge \text{school-principal}(g(1))(s')$
 $\wedge \neg \text{school-principal}(g(1))(g(2))$
 $\wedge \neg \exists s''. \tau(s'') \subseteq P1\text{-interval}(g(2)) \wedge \text{school-principal}(g(1))(s'')$
 $\wedge \neg \exists s'''. \tau(s''') \subseteq P2\text{-interval}(g(2)) \wedge \text{school-principal}(g(1))(s''')$

The Temporal Remoteness Implicature would require that the referent of the DP, $g(1)$, be a school-principal in a situation temporally located before any situation in the P2-interval from the topic situation (i.e. 1 year before the topic situation). If the NTMs competed in this way, then we would expect them to be in complementary distribution. However, P4 and P2 can both describe a change of state that took place one year ago, as we see in (16).

- (16) *Context:* Imagine that two years ago you went to visit James Floyd while he was chief. (James Floyd's term ended one year ago.)

Ohrolopē hokkolvnkē, vnmēkko {tatē / vnkē} encukopericvymvts.
 ohłolopí: hokkó:l-ankí: an-mí:kko {=tá:ti: / =ankí:} in-cokopiłêyc-ay-mát-s
 year two-P2 1SG.DAT-chief {=P4 / =P2} 3.DAT-visit.PFV-1SG.AG-P3-IND
 'Two years ago, I visited my former chief.' (RMM-Mus-07/21)

In (16), the speaker accepts both P2 and P4 when describing a chief who stepped down one year ago. Given these facts, we cannot account for the change of state inference of P1/P2 in the same way as I have shown we can for P4.

4. Nominal Tenses as Resource Situation Modifiers

I propose that Mvskoke P1 and P2 occupy another higher position in the DP, where they temporally modify the *resource situation* of a strong D (von Stechow 1994; Schwarz 2009, 2012). The two interpretations arise from ways of identifying the resource situation, $g(r)$. When $g(r)$ is salient in the common ground, from a previous mention of the entity or a *shared past experience* of the entity, then the NTM receives a Discourse Relate meaning. In the absence of a salient referent for $g(r)$, it is identified by default as the maximal situation exemplifying NP(x). This leads to a Change of State meaning for the NTM.

The key intuition behind this proposal is that P1/P2 identify the time of the situation in which the individual bearing the nominal property is unique. This has been argued to be provided by the resource situation. To see how this applies to P1, consider (17).

- (17) *P1 Shared Past Experience Context:* Imagine you and I are trying to get approval for our language project and we are trying to speak to judges and language teachers. Yesterday I spoke with Judge Mary. Today we are giving each other updates and Judge Mary walks past, greets us, and walks on. You ask me: Have you spoken with anyone about our project?

Ehe, fvccēcv isē emponayiyvnks.
 ihī, faccí:ca =eysí: im-poná:y-ey-ánk-s
 yes, judge =P1 3.DAT-speak.PFV-1SG.AG-P2-IND
 'Yes, I spoke with the judge (**that we just saw**).' (RMM-Mus-08/20)

In (17), the common ground contains a situation in the recent past which only contains Judge Mary and the interlocutors. By using P1, the speaker is referring back to the judge that the interlocutors have a shared past experience of.

Schwarz (2009, 2012) argues that strong D's have a situation variable as their first argument. I propose that P1 and P2 temporally modify the resource situation and have a structure as in (18).

- (18) $[_{DP} \emptyset_{def} [_{XP} s_r P1/P2] [_{XP} \lambda_1 \lambda_2 [_{NP} s_2 x_1 N]]]$

I give nominal P1 and P2 semantics as in (19), where they are partial identity functions on situations and add a presupposition about the temporal location of the situation. Because resource situations are only introduced with strong D's, I account for the definiteness restriction of P1/P2.

(19) *Nominal P1 and P2*

$$\begin{aligned} \llbracket P1 \rrbracket^{t^0} &= [\lambda s : \tau(s) < t^0 \wedge \tau(s) \subseteq \text{day}(t^0). s] \\ \llbracket P2 \rrbracket^{t^0} &= [\lambda s : \tau(s) < \text{day}(t^0) \wedge \tau(s) \subseteq \text{year.ago}(t^0). s] \end{aligned}$$

4.1. Discourse Related Interpretations

Discourse Related interpretations of P1 and P2 come about when the referent of the resource situation variable is provided by context. Consider the denotation for the DP in (17) below.

$$(20) \quad \llbracket [D_{def} \text{ } t_r \text{ } P1 \text{ } \lambda_2 \text{ } [NT_2 \text{ } \text{judge}]] \rrbracket^{g, t^0} = \iota x. \text{judge}(x)(g(r))$$

only defined if $\exists!x.x \in C \wedge \text{judge}(x)(g(r)) \wedge \tau(g(r)) < t^0 \wedge \tau(g(r)) \subseteq \text{day}(t^0)$

The DP will be defined only if there is exactly one judge in $g(r)$. In the context for (17), the contextually salient resource situation ($g(r)$) is the situation in which the interlocutors saw Mary. This situation also falls within the P1-interval. Thus the DP is defined and the NTM is interpreted as referring to the judge from that particular situation.

4.2. Change of State Interpretations of P1 and P2

Change of State readings occur in contexts supporting (merely) weak familiarity (Roberts 2002). Consider P2 in example (21).

- (21) *P2 Change of State Context*: The position of district court judge is always held by someone until he steps down and another judge takes his place. You know both the current and the previous judges quite well, but I don't know anything about them and haven't met them. You and I go to see the current judge about a language project of ours. We have to wait to see him, which is something the previous judge never did. While we are waiting to see him you want to tell me this.

Fvccēcv **vnkē** tat mehakēsekot owvnks.
 faccī:ca =**ankī**: =ta:t (i)m-ihā:k-i:-sikó-t o:w-ánk-s
 judge =**P2** =FOC 3.DAT-wait.IPFV-1PL.AG-NEG-SS be.IPFV-P2-IND

'The previous judge, he never let us wait for him.'

(RMM-Mus-07/21)

The key feature of weak familiarity relevant for NTMs is that the NP's referent is not established in the common ground. In (21) there is no contextually salient past situation for $g(r)$ to be anaphoric to. There is no previous shared experience and no previous mention of the judge, but the existence of the judge is entailed by context and world knowledge. I propose that when a DP is weakly familiar, $g(r)$ is identified by default as the maximal situation exemplifying the NP predicate.

I define a situation *exemplifying* $P(x)$, following Kratzer (2007), as a situation for which $P(x)$ holds in all sub-situations s' . That situation is *maximal* if there is no larger situation s'' in which $P(x)$ holds. In sum, a maximal exemplifying situation for 'x is a judge' is the largest situation of un-interrupted judgehood.⁹ Taking the temporal trace of a maximal exemplifying situation, $\tau(g(r))$, yields the maximal, temporally connected interval where $\text{judge}(x)$ is true. I abbreviate as $\tau(\text{judge}(x))$ and define temporal connectedness and maximality below.

⁹ One reason to think this is the default referent for $g(r)$ is that maximal, self-connected entities are the most salient entities for counting. See discussion in Kratzer (2007) on the counting principal.

(22) *Temporal Connectedness*

Two moments m and m' are *connected* w.r.t. a property P and an entity x iff $P(m)(x) \wedge P(m')(x) \wedge \neg \exists m''. [m < m'' < m' \wedge \neg P(m'')(x)]$

(23) *Maximality*

An interval t is *maximal* w.r.t a property P and an entity x iff $P(t)(x) \wedge \neg \exists t' [t \subset t' \wedge P(t')(x)]$

Placing this interval entirely in the past entails change of state, i.e. that the situation in which x is a judge is over. I give the DP in (21) the denotation in (24). This DP will be defined iff there is exactly one x in the context who is a judge throughout the maximal, connected interval for which x is a judge, and the maximal, connected interval throughout which x is a judge is entirely contained in the P2-interval. In other words, if there is exactly one judge whose tenure as judge is over.

- (24) $\llbracket [D_{def} \text{ } t_r \text{ } P2 \text{ } \lambda_2 \text{ } [NT_2 \text{ } \text{judge}]] \rrbracket^{g,t^0} = \lambda x. \text{judge}(x)(\tau(\text{judge}(x)))$
 only defined if $\exists !x \in C \wedge \text{judge}(x)(\tau(\text{judge}(x))) \wedge$
 $\tau(\text{judge}(x)) < \text{day}(t^0) \wedge \tau(\text{judge}(x)) \subseteq \text{year.ago}(t^0)$

This proposal correctly predicts that P1/P2 only receive Change of State interpretations in contexts where the DP is only weakly familiar. These are the only situations where $g(r)$ will receive a default value. In these contexts, P1/P2 will entail Change of State without semantically encoding it. Because Change of State is a default interpretation for P1/P2, my proposal correctly predicts that the Shared Past Experience meaning is the preferred interpretation of P1/P2.

5. Predictions and Cross-linguistic Picture

My proposal predicts that we should find complex NTM constructions in Mvskoke. Given the structure proposed, P4 should be able to co-occur with P1/P2. In these constructions, P1/P2 would be at the level of the DP and P4 would appear lower in the NP as in (25).

(25) *Structure of a P1/P2 DP embedding a tensed NP*

$\llbracket_{DP} \emptyset_{def} [XP_3 \text{ } S_r \text{ } P1/P2] [XP_2 \text{ } \lambda_1 \text{ } \lambda_2 [XP_1 \text{ } (EXH) [TP \text{ } S_2 \text{ } P4 [NP \text{ } X_1 \text{ } N]]]] \rrbracket$

This prediction is borne out in Mvskoke. Example (26) is a naturally occurring example with both P2 and P4 appearing with the DP *mv vculvke* ‘the elders’.

- (26) *mv vculvke vnkē tatē mv fullvtē tat*
ma acol-akí =ankí: =tá:ti: ma foll-atí: =ta:t
 DEM elder-GPL =P2 =P4 DEM go.about.TPL-P4 =ATN
 ‘when our elders were here...’ (Robin Soweka Interview, 0:06:48-0:06:53)

Further fieldwork is needed to test the predictions of the interactions between P4 and P1/P2 and the interpretations available to complex tense DPs.

This work motivates a new typology of NTMs and fills a gap in the cross-linguistic understanding of NTMs. Previous work on NTMs focused on languages with just one type of NTM and assumed that NTMs appeared in just one location in a DP. My investigation of Mvskoke reveals that there are two types of NTMs and they appear in two possible locations in a DP. Mvskoke thus motivates the typological picture in Table 4 in which there are three types of languages with NTMs. Languages like Paraguayan and Mbyá Guaraní have only low NTMs. Languages like Somali and Kipsigis appear to have only high NTMs. Mvskoke adds a third type of language which appears to have both high and low NTMs. Salish languages like $\text{?ay?ajju}\theta\text{em}$ may also fit into this category.

NTMs	Languages
Low NTMs only	Mbyá and Paraguayan Guaraní (Tonhauser 2007; Thomas 2014)
High NTMs only	Somali (Lecarme 1996, et. seq.)
Both	Mvskoke and ʔayʔajuθəm (Reisinger et al. 2021)

Table 4: Typological Picture for Languages with NTMs

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