The building blocks of aspectual interpretation*

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1. Introduction

This paper is an attempt to derive the proper semantic intepretation of a particular morphological opposition found in Mẽbengokre verbs.[1] Mẽbengokre verbs don't inflect for any specifically temporal or aspectual morphology. Instead, the verbal paradigm opposes a nominalized, or non-finite, form of the verb to a fully verbal, or finite, form.[2,3] This opposition has as a side effect a contrast in aspectual interpretation, but only in matrix clauses. The following sentences exemplify the opposition between verbal and nominal forms of verbs in main clauses:[4]

(1) krwɤj jã nẽ mop krẽ
parakeet DEM NFUT malanga eat.V
"This parakeet ate (the) malanga."

(2) krwɤj jã nẽ kutɛ mop krẽn
parakeet DEM NFUT 3ERG malanga eat.N
"This parakeet has eaten malanga (at least once in his life)."

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[1] Mẽbengokre is a northern Jê language spoken in northern Mato Grosso and southern Pará, Brazil, by approximately 10,000 people belonging to the Xikrin and Kayapó nations.

[2] "Finiteness" is a misleading term, as tense, mood, evidentiality and other inflectional categories are expressed by means of left-peripheral particles which don't distinguish between types of predicates. For this reason, in this paper we will use the labels "nominal" versus "verbal" forms of the verb, however unusual that might sound.

[3] Another opposition that is relevant to aspectual interpretation is number, which we won't treat here for reasons of space. For discussion, see Salanova (2007).

[4] V indicates the verbal form of the verb, N the nominal form. Other abbreviations include NEG (negation), NFUT (non-future), DEM (demonstrative), and the case labels ERG (ergative), NOM (nominative), DAT (dative), ACC (accusative). The numbers 1, 2, 3 refer to first exclusive, second and third person pronominal forms, respectively.

The meaning of (1) can be characterized as positioning the event with respect to a topic time that is set by narrative context.[5] In (2), on the other hand, the reference interval in which the event is contained is not anaphoric to discourse, but rather coterminous with the subject's lifespan (mutatis mutandis for inanimate subjects). This interpretation has been variously described as "stative" or "subject-oriented" (in the sense that it ascribes a property to the subject, rather than focussing on the event itself) in the descriptive literature.

As is suggested by our glosses, we will attempt to characterize the opposition in meaning as being roughly equivalent to the opposition between the English present perfect and the simple (perfective) past, without attempting to justify this empirically. We will therefore explain this opposition in English briefly before moving on to the Mẽbengokre facts.

2. Perfect versus perfective in English

The following is an abbreviated and non-standard discussion of some points of contrast between present perfect and past perfective in English. For a more thorough contemporary discussion, the reader is referred to Iatridou et al. (2001) and references therein.

Consider the following minimal pair:

(3) Bill arrived at seven last night.

a. He read the paper.

b. He has read the paper.

The two continuations differ in many respects; what we wish to call the reader's attention to is that, while (3a) links the event time directly to the topic time (which is set by the previous discourse context, and then advanced), no such direct link exists in (3b). That is, in narrative, (3a) means that Bill read the paper at some time sufficiently soon after arriving. No such relation between arriving and reading the paper is implicated if the continuation is (3b); i.e., that sentence could be used for a reading of the paper that took place before or after Bill's arrival.

In the perfect, i.e., (3b), what seems to be linked to the topic time is not the time interval corresponding to the event of reading the paper, but rather some other time interval. The eventuality's time (i.e., the reading of the paper) is contained in this interval.

What is this interval? In Iatridou et alii's work this is what is called the "perfect time span". In English, the right boundary of this time span is set by evaluation time (i.e., the present in the present perfect), while the left boundary may be set by a prepositional phrase headed by specialized adverbials such as *since*. If no specialized adverbial is present ("I've read Annu Kareninu five times"), the present perfect sentence is understood as referring to the subject's lifespan up to evaluation time. This particular case is often called the "experiential perfect".

The point to be stressed is that the event's time is not linked directly to topic time; it's the perfect time span, whether this means the subject's lifespan up to evaluation time

[5] For a discussion of the notion of topic time, the reader is referred to Klein (1994).

or something else, that is linked to topic time. We summarize this in the two semi-formal LFs below:[6]

(4) *Perfective*
$[\![\text{PFV } \phi]\!]^t \Leftrightarrow \exists t' : t' \subseteq t : [\![\phi]\!]^{t'}$

(5) *Perfect (experiential)*
$[\![\text{PERF } \phi]\!]^t \Leftrightarrow \exists t' : RB(t') = t \wedge LB(t') = \text{the birth of } a : \exists t'' : t'' \subseteq t' : [\![\phi]\!]^{t''}$

At this point, one could raise the following objection: *any* event in which *a* is involved has to have taken place in *a*'s lifespan, whether it be described as perfective, perfect, or imperfective. This is absolutely true; the point, however, is that the (experiential) perfect claims *no more than this*, whereas the perfective and the imperfective further claim (or implicate) that the event in question took place relative to a more restricted interval that is set by surrounding discourse. This, we contend, is one of the main defining traits of the perfect. For reasons of space we cannot discuss here how certain other properties ascribed to the perfect (such as the "perfect paradox", cf. Klein 1992, and its "stativity", cf. Katz 2003) could be derived from the trait that we emphasize here.

Thus, linking or not the event time to the topic time directly is, for the purpose of our discussion, the essential point of contrast between perfects and perfectives.[7]

3. The aspectual contrast in Mẽbengokre

As we said above, we assume that the contrast in aspect between the Mẽbengokre sentences in (1) and (2) roughly boils down to the contrast in meaning between the LFs in (4) and (5), respectively. For arguments in defense of this assumption, the reader is referred to Salanova (2007). The question that arises now is what the contrast in category between verbal and nominal forms of verbs has to do with this contrast in interpretation. Couldn't one simply say that the morphology that distinguishes between the two verb forms is just the manifestation of an aspectual feature, say [+/– perfect]?

We contend that relating the aspectual contrast to a contrast in category is desirable at least on the following grounds: (a) it gives us a basis to explain the aspectually-based ergativity split found in Mẽbengokre,[8] and possibly aspect-driven splits more generally, and (b) it relates the interpretation of nominal forms of verbs to the interpretation of underived nouns as clauses. In addition, the so-called nominal form of the verb has clearly nominal uses in embedded contexts, and it is desirable to relate these to its use in matrix clauses.

Our first step in defending the perfect-as-nominal approach is to show that sentences such as (2) are identical in form to nominal expressions that refer either to an event, or to one of the participants of the event. We do this in section 4. In section 5, we show

[6] *RB* and *LB* stand for the right boundary and left boundary of a time interval, respectively.

[7] In fact, the perfect is one among a couple of verb "tenses" in English which don't link directly to topic time, the other being the generic (or habitual). For reasons of space, we don't discuss these here.

[8] The split can be seen in (1) versus (2) in the case labels for the transitive subject. For discussion of the ergative split, see Reis Silva and Salanova (2000), Reis Silva (2001) and chapter 2 of Salanova (2007).

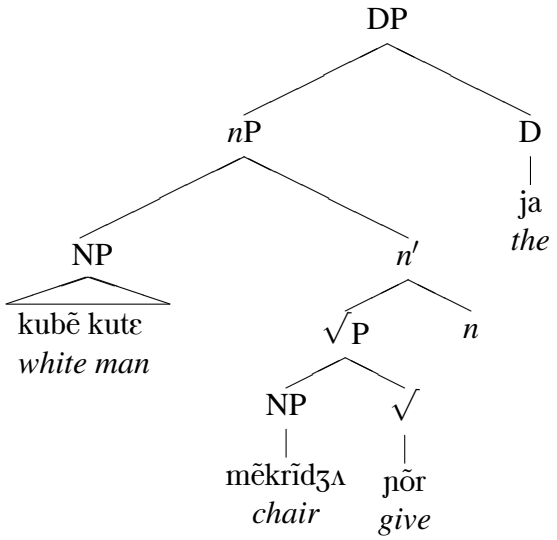
that it's a property of all nominal expressions that they can appear without an overt copula as matrix clauses, and so we shouln't be surprised to find nominal forms of verbs heading matrix clauses. In sections 6-8, we explain how the aspectual interpretation of (2) is derived from its nominalness.

4. Embedded nominal expressions

Consider the noun phrase in (6), headed by a nominal form of the verb. Its interpretation can be either of the two participants of the event described by the head which are expressed by indefinite noun phrases.

(6) kubẽ kutɛ mẽ i-mʌ̃ mẽkrĩdʒʌ ɲõr jã
barbarian 3ERG PL 1-DAT chair give.N DET
'The chair(s) that a/the white man gave us', or
'The white man/men that gave us a/some/the chair(s).'

We'll be minimalistic, and assign the structure in the figure below to noun phrases such as that in (6).[9] The impossibility of using most left-peripheral particles in such constructions attests to the lack of higher functional structure. Other aspects of the structure below, with the exception of the fact, discussed below, that NPs may merge with their argument-takers, should be taken as following from theory-internal assumptions.



Let us take as a starting point this structure, and derive the translations we observed in (6) by working our way up through it. The following denotations are straightforward:[10]

(7) a. $[\![\text{ɲõr}]\!] = \lambda x_e.\lambda e_v.\text{give}'(e,x)$

[9] The dative adjunct of (6) is omitted here.

[10] The basic semantic types used are: individuals (e), eventualities (v), which can be considered just a special type of the former, and truth-values (t).

b. $[\![\text{mẽkrĩdʒʌ}]\!] = \lambda x_e.\text{chair}'(x)$

c. $[\![\text{kubẽ}]\!] = \lambda x_e.\text{barbarian}'(x)$

Given that indefinite noun phrases in Mẽbengokre have no overt determiners, we will consider them to be determinerless NPs, of type $\langle e,t\rangle$. They come together with the main predicate by the compositional rule of Predicate Restriction, introduced by Chung and Ladusaw (2004). Predicate restriction doesn't alter the semantic adicity of the predicate; it simply imposes a restriction on one of the variables that satisfies it.[11] If we apply this composition rule to our example, we get:

(8) $[\![\text{mẽkrĩdʒʌ ɲõr}]\!] = \lambda e.\lambda x.\text{give}'(e,x) \wedge \text{chair}'(x).$

We won't go into how the external argument is introduced, and we will assume that *kutɛ* is vacuous. So the denotation we get for the core of (6) is:

(9) $[\![\text{kubẽ kutɛ mẽkrĩdʒʌ ɲõr}]\!] =$
$\lambda y.\lambda e.\lambda x.\text{give}'(e,x) \wedge \text{chair}'(x) \wedge \text{barbarian}'(y) \wedge \text{Agent}(e,y)$

Thus the denotation that we arrive at for the noun phrase in (6) is an n-place property of individuals. This noun phrase combines with a determiner to yield a definite description. What is the determiner *ja*, then? We will claim that it is an unselective binder. This means that it binds a free variable contained in its sister constituent, but which variable is bound (if the constituent contains more than one) is not determined by structure. Any one variable is bound by *ja*, while all other variables that are free at this point in the structure are bound by existential closure:

(10) $[\![\text{ja}]\!] = \lambda P_{et}.\iota x P(x)$

(11) kubẽ kutɛ mẽkrĩdʒʌ ɲõr ja
barbarian 3ERG chair give.N DET

a. 'the chair that a white man gave'
$\iota x \exists e \exists y$: $\text{give}'(e,x) \wedge \text{chair}'(x) \wedge \text{barbarian}'(y) \wedge \text{Agent}(e,y)$

b. 'the white man that gave a chair'
$\iota y \exists e \exists x$: $\text{give}'(e,x) \wedge \text{chair}'(x) \wedge \text{barbarian}'(y) \wedge \text{Agent}(e,y)$

In this way we derive all the readings of the ambiguous entity-denoting nominal expressions such as (6). Apparently identical to these in structure is another construction headed by nominal forms of verbs: eventive noun phrases. Cf. the following:

(12) a. bʌ kam i-mõr kuni
forest in 1-go.N all
"all my goings into the woods"

[11] For a more detailed discussion of the semantic composition of nominal expressions of this type, see Salanova (2006).

b. ijɛ ʌktirɛ krõr jã
1ERG hawk.people make.peace.N this

"this (situation in which) I was making peace with the Àktire"

The meaning of the latter has to be eventive, never a proposition. So (12b) can't mean "the fact that I made peace with the Àktire", for example.

We contend that the semantics that we have developed for participant readings above extends without significant modification to get the senses in (12). The only assumption that needs to be made explicit is that the lexical roots under consideration here project an event argument position.[12] This argument is what is bound by the determiner to yield the eventive interpretations above. To see how this works, consider how one would derive the two interpretations of (13).

(13) ba bẽnjadʒwʏr kutɛ bẽn dʒir ma
1NOM chief 3ERG speech place.N hear

a. '[I heard] the reciting of the/a ritual speech by the/a chief'
$\iota e \exists x \exists y$: recite$'(e,y,x) \wedge$ chief$'(y) \wedge$ speech$'(x)$

b. '[I heard] the ritual speech that the/a chief recited'
$\iota x \exists e \exists y$: recite$'(e,y,x) \wedge$ chief$'(y) \wedge$ speech$'(x)$

Now that we have a structure and interpretation for referential expressions headed by nominal forms of verbs, we are ready to address the cases where such forms appear in matrix clauses. But first, we will consider matrix clauses headed by underived nouns.

5. Nominal matrix clauses

Regular underived noun phrases have a property that is very relevant for our analysis: they show an ambiguity between referential interpretations, as in the (ii) readings below, and propositional interpretations, as in the (i) readings, with no obvious distinction between the two interpretations in the morphosyntax:

(14) a. tɛp kam tʃaw
fish in salt

i. "There's salt on the/a fish."

ii. "The/a salt that there is on the/a fish."

b. kubẽ ɲõ kʌ
barbarian POSS canoe

i. "The/a white man has the/a canoe."

ii. "The/a canoe that the/a white man has."

[12]For discussion and the initial motivation for the event argument, see Davidson (1967). This argument would be the referential argument of such roots; its meaning can be thought of as corresponding to that of the action nominal.

This ambiguity has parallels in the domain of constructions involving nominal forms of verbs. Compare one such case, (15), with the examples above. The ambiguity doesn't arise in (verbal forms of) verbs, which always receive a propositional interpretation.[13]

(15) kutɛ arɛ̃ŋ
3ERG hear.N.SG
i. "(S)he has said."
ii. "(The event) of her saying it."

What should we make of the ambiguity between "nominal" and "sentential" readings of all noun phrases? Are nouns always ambiguous between being "predicative" and being "referential"?

We contend that this is precisely what is *not* the case. Nouns, contrary to (finite) verbs, *never* predicate directly. To show this, observe the following examples, which are more or less representative of the full range of nominal clauses:

(16) a. bʌ kam mrɯ
woods in game
"There is/are (an) animal(s) in the woods."

b. kubɛ̃ ŋõ kʌ
barbarian POSS canoe
"The white man has a canoe."

In neither of these cases do we have a regular subject that is identified with the noun's referential argument. Instead, the "subjects" of matrix clauses headed by nominal predicates are locative postpositional phrases, with various meanings. The constructions in which they appear can be described as existential. Existential constructions simply state that there are individuals that fit the description of the predicate in a particular location.

The most straightforward example of an existential construction is represented by (16a). In addition, several scholars (cf. Benveniste 1971 and Freeze 1992, among others) have noted the parallels between possessive and existential constructions. To Freeze, in particular, possessive sentences are a special case of existential constructions with dative or genitive "locations". In this spirit, we consider possessive constructions such as (16b) to be part of the same phenomenon with (16a).

More specifically, we contend that while verbal predication (where α is the subject) is just $[\alpha\ P(x)] \rightarrow P(\alpha)$, predication in nominal sentences is indirect, i.e., $[\alpha\ P(x)] \rightarrow \exists x P(x) \wedge Q(x, \alpha)$, where Q represents a relation expressed by a postposition.[14] The relation can be locative or possessive, something which, as we said above, we consider a special

[13] In line with what we said above about the multiple readings of internally-headed relative clauses, the construction in (15) also has the reading "what she said."

[14] Note the counter-intuitive postulation that in "there are animals in the woods", the subject is "woods". This nevertheless accords with the cross-linguistic generalization established by Freeze (1992), where locations in existential constructions pattern distributionally with subjects of verbal predicates.

type of locative relation. One might nevertheless ask whether, giving enough latitude to what Q can be, "indirect" predication doesn't mimic the way in which external arguments are introduced in a proposal such as Kratzer's (1996), i.e., $\exists e P(e) \wedge Q(e, \alpha)$, where Q is the relation "agent-of". We contend that the two types of predication should be kept distinct, and we support our contention with a more precise characterization of Q below.

A first approximation of the translation of examples (16a-b) is, respectively, the following:

(17) a. $\exists x$: animal$(x) \wedge$ in(the woods)(x)
b. $\exists x$: canoe$(x) \wedge$ to(barbarian)(x)

This approach highlights the essential unity between the "sentential" and "referential" interpretations of nominal constructions. Note the parallel with one of the "nominal" interpretations of such constructions:

(18) a. ιx: animal$(x) \wedge$ in(the woods)(x) (i.e., the animal in the woods)
b. ιx: canoe$(x) \wedge$ to(barbarian)(x) (i.e., the barbarian's canoe)

What we propose is to interpret nominal forms of verbs in this way, that is, as if they were nouns in an existential construction. But how does this help us derive the particular aspectual interpretation that nominal forms of verbs get as main clauses?

6. The same idea, applied to "deverbal" nouns

As we saw above, one of the readings of the nominal form of the verb is just $\lambda e.\exists x_1, \ldots, x_n P(e)(x_1)\ldots(x_n)$, or, after merging with a (possibly null) determiner, $\iota e.\exists x_1, \ldots, x_n P(e)(x_1)\ldots(x_n)$. By analogy to what was described for underived nouns, predication involving a nominalized verb will be done "indirectly", i.e., what we represented above as $[Q(x, \alpha)\ P(x)] \rightarrow \exists x P(x) \wedge Q(x, \alpha)$. Let's examine how one gets from the embedded reading of the nominalization, which we have already worked out, to the matrix interpretation, if we apply the reasoning applied to underived nouns:

(19) ba bẽnjadʒwɤrɤrɛ kutɛ bẽn dʒir ma
1NOM chief 3ERG speech put.N.SG hear.V.SG
'[I heard] a chief reciting a ritual speech'
$\iota e \exists x \exists y$: recite$'(e, y, x) \wedge$ chief$'(y) \wedge$ speech$'(x)$

(20) bẽnjadʒwɤrɤrɛ kutɛ bẽn dʒir
chief 3ERG speech put.N.SG
"There is a reciting of a ceremonial speech by a chief."
$\exists e \exists x \exists y$: recite$'(e, y, x) \wedge$ chief$'(y) \wedge$ speech$'(x)$

That is, matrix clauses headed by a nominal form of a verb are interpreted as "there is a V-ing" or "there is X V-ing". Yet so far the analogy with existential constructions for nominal forms of verbs seems to give us no leads into the particular aspectual interpretation

that matrix clauses with a non-finite form get.[15] The key to connecting the two lies in one important fact about existential sentences such as those in (16), namely that they have a "location", as it were. Nominal constructions without a location are weird out of the blue as clauses in Mẽbengokre (though obviously not as noun phrases):

(21) a. ?? tʃaw
salt
"There is salt."

b. ?? kʌ
canoe
"There is a canoe."

Why might this be the case? Not differently from what we might say about the English translations, one could maintain that a location is always independently required. An overt location can be dispensed with if one is salient in the discourse context, and perhaps, like in English, in special cases such as "there is a God", "there are unicorns", and so on. Nevertheless, whether for pragmatic reasons or, as we will argue, because of the syntax of the construction, a location restricting the existential claim is always implicit.

In clauses formed with underived nouns, such as those in (16), the location is straightforwardly a locative phrase, that can be a possessor, a location, and possibly other things. In the case of nominal forms of verbs, there are a few options as to what the location can be:

(22) a. There could be no location, just $\exists e\, P(e)$.

b. The location could be the ergative subject.[16]

c. The location could be a (phonologically null) spatial location.

d. The location could be a (phonologically null) time interval.

The choice that makes the most of the analogy with existential sentences is superficially (b), as can be seen by comparing a plain existential clause formed with an underived noun with a clause headed by a nominal form of a verb:[17]

(23) a. [bʌ kam]$_S$ [mrɯ]$_P$
woods in game
"There is/are (an) animal(s) in the woods."
$\exists x[\text{in}'(\text{the-woods}', x)]_S[\text{animal}'(x)]_P$

[15] In fact, the interpretation give in (20) could be assumed to be the interpretation of a regular (finite) verbal clause, modulo linking with evaluation time. This should be kept in mind for contrast with what we will argue is the proper interpretation of matrix nominal clauses.

[16] For simplicity, here we will only examine transitive sentences. We assume that the relation *erg*$'$, employed below, introduces the external argument with whatever theta role is required by the construction (normally agent).

[17] In these examples, subscript *S* stands for the "location", and subscript *P* for the "locatum".

b. [bẽnjadʒwɤrɤrɛ kutɛ]$_S$ [bẽn dʒir]$_P$
chief 3ERG speech put.N.SG
"There is a reciting of a ceremonial speech by a/the chief."
$\exists e[\text{ERG}'(\text{the-chief}', e)]_S[\text{speech-reciting}'(e)]_P$

The logical form in (23b), however, as we anticipated above, is no different from the way external arguments are introduced in proposals such as Kratzer's (1996), with no effect on aspectual interpretation. So, if we want to account for the stativity of ergative clauses by recourse to the parallel with existential constructions, the story can't end here.

It seems to be the case that, rather than just being a way to introduce any type of argument, the "locative subjects" in locative constructions do really get a "location" θ-role. While those relations expressed by the locative postpositions in (16) fit the bill, and possibly make the locative relation precise, ERG arguments by themselves are not enough to be "locations" or "subjects" of existential constructions. This seems to be the case also in English, given examples such as the following:

(24) a. # There was a performance by Martha Argerich.
b. There was a performance last night.
c. There was a performance at the amphitheater.

Under our assumptions, the perceived incompleteness in (24a) is due to the fact that the existential predicate requires a locative argument, and there is no way of getting an agent to be that argument in English. That is, only spatial or temporal locations satisfy the "thematic" requirements of the external argument ("location") of the locative construction.[18]

We propose that the difference between English and Mẽbengokre existential constructions is that in Mẽbengokre a noun phrase that doesn't fit the θ-role assigned by the existential construction to its "subject" or "location" is interpreted *twice*: once as whatever theta role it gets from the embedded clause, and once more as a location. The equivalent of (24a) in Mẽbengokre is therefore interpreted as "there was a performance by Martha Argerich to Martha Argerich", or (given that "there is X to Y" in English is spelled out as "Y has X"[19]) "Martha Argerich has performances by herself", or, as we ultimately wish to argue, "Martha Argerich has performed".

How does a single participant come to be interpreted twice in the structure? For purely illustative purposes, we could make an analogy with the following construction, described by Freeze (1992):

(25) This flour has weevils in it.

[18]The essentially locative nature of that argument is evidenced in English by the etymology of the expletive used in existential constructions.

[19]Cf. also the following:

There is a message for you ≡ you have a message.

Freeze characterizes (25) as involving inalienable possession, which might suggest that even in the case where the location is literally locative, it is interpreted twice in an existential construction, once as a pure location, once as the subject of an "inalienable property".

The particular problem posed by Mẽbengokre is therefore not whether a "double thematic interpretation" of the subject is plausible, but rather how one obtains it. No overt pronominal, as in (25), marks the position where the locative θ-role would be transmitted. For reasons that we cannot make explicit here, we will assume that the higher (locative) predicate's subject is saturated by a pronominal element that is correferential with the highest argument in the lower clause, that is, something like "backward control" (cf. Polinsky and Potsdam 2002 for discussion).

At this point we could ask where the locative predicate in nominal clauses comes from. For the purposes of this paper we bite the bullet and admit that it is a predicate that exists in the lexicon, though one that is independently needed to interpret clauses "headed" by underived nouns. Why it is required will become clear below, as we discuss linking of the eventualities to topic time through higher functional projections.

Let us call this predicate LOC. One might ask if LOC isn't just another name for a stativizer. The answer is that while the semantics resulting from merging LOC might be like the semantics of a stativizer,[20] separating the stativizing element from the category of the clause head allows us to account for the fact that nominal constructions are not only stative matrix clauses, but are also used non-statively in embedded contexts or referential expressions.

7. Obtaining the experiential perfect

So far, we have argued for an equivalence between the Mẽbengokre sentence in (26a) and the English sentence (26b).

(26) a. kɾwɤj jã nẽ kutɛ mop krẽn
parakeet DEM NFUT 3ERG malanga eat.N.SG

"This parakeet has eaten malanga."

b. There is an eating of malanga by this parakeet to this parakeet.

c. $\exists e\colon \textsc{loc}'(e, \text{parakeet}') \wedge \text{eating-malanga}'(e) \wedge \text{Ag}'(e, \text{parakeet}')$

Of course, the parallel is only structural. The English sentence in (26b) is meaningless for independent reasons. We will assume the translation in (26c), which already incorporates the notion that subjects are interpreted twice in existential constructions, once in the role which relates them to the predicate, and once as locations. This makes the locative predicate LOC the locus of our discussion.

[20] The prototypical states then being, at some deep level, "having", or "existing in a location."

Above we claimed that (26a) is interpreted as an experiential perfect. Our task is to show that the logical form in (26c) is equivalent to that interpretation. This is what we do in this section.[21]

Iatridou et al. (2001) propose a semantics for the perfect broadly in accordance with the "extended now" theory of McCoard (1978). In such a theory of perfect meaning, the perfect consists of an interval, the "perfect time span", whose right boundary (*RB*) is the evaluation time, and whose left boundary (*LB*) is set by a special type of adverbial. The semantics are formalized by von Fintel and Iatridou (2005) as follows:

(27) a. $[\![\text{PERF } \phi]\!]^t \Leftrightarrow \exists t' : RB(t,t') \wedge [\![\phi]\!]^{t'}$

b. $RB(t,t') \Leftrightarrow t \cap t' \neq \emptyset \wedge \forall t'' \subseteq t' : t'' \preceq t$

The claim is that the proposition ϕ is true at some interval that goes up to the evaluation time. For the experiential perfect, the definition needs to be adapted somewhat, namely to translate the claim that the proposition ϕ is true at some point in the interval, and to equate the interval with the subject's lifespan. That is, the formula we had in (5), repeated here for convenience:

(28) $[\![\text{PERF } \phi]\!]^t \Leftrightarrow \exists t' : RB(t') = t \wedge LB(t') = \text{the birth of } a : \exists t'' : t'' \subseteq t' : [\![\phi]\!]^{t''}$

It's relatively trivial to arrive at this meaning starting from the translation given in (26c). Informally, we could propose a lexical entry for LOC as follows:

(29) $[\![\text{LOC}]\!]^t = \begin{cases} \lambda y.\lambda x.x \text{ is in space in } y \text{ at } t, \text{ if } x \in D_e \\ \lambda y.\lambda e.e \text{ is in time in the experience of } y \text{ at } t, \text{ if } e \in D_v \end{cases}$

It seems counterintuitive to set the endpoints of an individual's life-span ("experience") in the semantics, since, after all, if $P(\alpha)$ at some interval t, then the interval has to be contained in the time span during which α exists. Nevertheless this is one plausible way to assign an interpretation to an existential perfect that lacks an adverbial phrase to specify the left boundary of the perfect time span within von Fintel and Iatridou's (2005) proposal. Thus:[22]

(30) a. $[\![\text{LOC}]\!]^t = \lambda x.\lambda e.\tau(e) \subseteq \tau(x)$

b. $\tau(x)_{D_e \to D_i} := \lambda x.\iota t' : RB(t') = t \wedge LB(t') = \text{the birth of } x$

This is nothing other than the meaning of the experiential perfect that we expanded in (28) above.

[21] The idea of identifying the perfect with an existential construction is not new, and is explored by Iatridou (2003).

[22] In the definition of τ, t stands for the evaluation time applied to LOC. D_i is a domain containing all time intervals.

8. Two ways to link with evaluation time

Without making it fully explicit, we have taken the position that the projection of lexical predicates is category-independent, rather than assuming that the basic form of the verb is categorially specified, and the other is derived from it, either creating a deverbal noun or a denominal verb. Category-neutral lexical predicates that project a referential argument with the right features, i.e., an argument $e \in D_v$, can become both nouns and verbs. If they merge with v, the e variable gets existentially bound immediately, to yield a proposition. If they merge with n, they can head referential expressions, or become propositions by further merging with the higher predicate LOC, which, unlike the existential closure that applies to verbs, requires a locative subject.

We haven't discussed how the proposition formed in each case links to evaluation time, to form a time-delimited proposition. For verbs, we will simply stipulate that their dependence on a time assignment is hard-wired in their semantics, thus:

(31) $\llbracket v \rrbracket^t = \lambda P_{vt}.\exists e\colon \tau(e) = t.P(e)$

We are now in a position to understand why LOC is required: the denotation of n, contrary to that of v, is not relativized to times. We stipulate that being linked to topic time is a sine qua non condition for the interpretation of a proposition. An additional (time-dependent) predicate is therefore necessary in order to interpret nouns. What Mẽbengokre has in its lexicon that can satisfy this requirement is the locative relation LOC, which is employed to interpret both "underived nouns" (i.e., those whose referential argument is an entity) and "verbal nouns" (i.e., those in which the referential argument is an eventuality). Though Mẽbengokre has only this resource, it seems that Universal Grammar provides languages with another option to resolve the mismatch between noun denotation and higher functional structure, namely the equative copula that we know from many better-studied Indo-European languages. A discussion of the differences between these two "auxiliary predicates", their acquisition, and other questions that could be raised here would take us too far afield.

9. Conclusion

In this paper, we have argued that a particular aspectual opposition found in Mẽbengokre, which we identified with the opposition between the English present perfect and the simple (perfective) past, should not be considered a primitive, but rather should be derived from a categorial distinction in the predicate. This opposition, between a nominal and a verbal form of the verb, forces the predicate to be interpreted as the locatum of an existential construction in one case (when it's nominal). The latter parts of the paper endeavor to show that such a construction in fact yields an aspectual interpretation that translates the English present perfect, in particular its "experiential" reading.

Though we didn't aggressively pursue applications of our analysis to other, better-known languages, the direction to proceed should be clear. As we mentioned at the end of section 6, the "auxiliary predicate" LOC is reminiscent of a stativizer. The difference

seems to boil down to a (minimal) difference in the division of labour in the composition of perfects and other "compound tenses" in different languages: on the one hand one has languages where the stativizing morphology merges with the verbal word, yielding a participial (i.e., an adjective), which requires a "copular" auxiliary; on the other, one has those where stativity is in the (existential) auxiliary, the lexical projection itself being nominal, and thus not stative. It's not unreasonable to suppose that the same constituent parts underlie both options for constructing the perfect.

Incidentally, the discussion of Mẽbengokre nominalizations offers an unexpected answer to the problem of the opposition between perfects and perfectives, which could be paraphrased through the following question: why should languages have recourse to two distinct tense forms that have often overlapping truth conditions (i.e., the existential perfect and the simple past)? The answer I propose is the following: such a distinction exists precisely because languages can exploit the more basic (and independently present) categorial distinction between verbs and nouns, and use the latter to drive a wedge between the event time and topic time.

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