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1.0 Introduction

The literature on non-culminating accomplishments notes an intriguing contrast between languages like English and languages like Skwxwú7mesh (a Salish language). In the former, accomplishment verbs in the perfective necessarily culminate, while in the latter, culmination is often an implicature, but not an entailment. We can see this contrast in the example below from Skwxwú7mesh (Jacobs 2011:111) and its English translation.

(1) chen lhích’it-Ø ta seplin welh es-kw’áy an tl’exw-Ø
   1SG.SUB 1cut-CTR-3OBJ DET bread but STAT-cannot too hard-3SUB
   ‘#I cut the bread but I couldn’t. It was too hard.’

Cutting the bread qualifies as an accomplishment that culminates in a state of the bread being cut. The inference to the result state can be cancelled in Skwxwú7mesh, but not in English.

Malagasy is often mentioned in this context as a language with non-culminating accomplishments. An example is provided in (2)a, which contrasts with (2)b, which is incompatible with a denial of culmination (much like its English translation). The two examples have the same verb root (sambotra ‘catch’), but differ in voice: (2)a bears agent topic voice (AT), whereas (2)b uses maha-.

(2) a. Nisambotra alika io zaza io nefা faingana loatra ilay alika
   PST-AT-catch dog DEM child DEM but fast too DEF dog
   ka tsy azony.
   COMP NEG do-3
   ‘This child caught a dog #but it was too fast, so it didn’t get caught by him.’

   b. Nahasambotra alika io zaza io #neфа faingana loatra ilay alika
   PST-AHA-catch dog DEM child DEM but fast too DEF dog
   ka tsy azony.
   COMP NEG do-3
   ‘This child managed to catch a dog #but it was too fast, so it didn’t get caught by him.’

The prefix maha-, as well as apparently encoding culminaion, also appears to be ambiguous between an ability reading and a causative reading, as illustrated in (3) (adapted from Phillips 2000).

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1 We follow Phillips (2000) and Travis (2010) and analyze maha- as morphologically complex (see section 4.4), but for simplicity and to conform to the existing literature, we refer to it as maha-. The initial m- alternates with n- in the past tense and h- in the future tense, so we gloss it as AHA. For other glosses, we follow the Leipzig glossing conventions.
This paper places the Malagasy data in (2) in the context of the general debate on culminating and non-culminating accomplishments. Rather than aiming at an explanation of the non-culminating accomplishment in (2)a per se, we focus on the syntax-semantics interface of Malagasy voice that explains the differences between (2)a and (2)b.

Our analysis builds on core insights from Paul et al. (2015, 2016), but shifts the burden of the explanation to maha-. We take our inspiration from Phillips (1996, 2000) and Travis (2010), who analyze maha- as a functional predicate, akin to English experiencer or causative have in examples like ‘Mary had the students revise their papers twice’. Our central claim is that maha-introduces a relation that Wolff (2007, 2014) labels double prevention. In Wolff’s analysis, double prevention underlies the semantics of English enable or allow in examples like ‘He allowed the water to flow down the drain’ in contexts where a plug in the sink prevents the water from flowing down the drain, and an agent who removed the plug prevents the plug from doing so, enabling the water to run down the drain. We will show how double prevention comes into play in sentences containing eventive and stative roots, and how it accounts for the range of readings labeled enablement, causation and unintentionality in the literature.

The outline of the paper is as follows. Section 2 provides a short background on Malagasy grammar. Section 3 presents the data on culminating and non-culminating accomplishments in the language. In section 4 we walk through our analysis and section 5 concludes.

2.0 Background on Malagasy

Malagasy is an Austronesian language spoken in Madagascar that has fairly rigid VOS word order. Importantly for this paper, the language has what is often described as a rich voice system. Simplifying somewhat, the verbal morphology indicates the semantic role of the subject (sometimes called the “topic” or “trigger” in the literature). Thus Actor Topic verbs have an agent as the subject, as in (4)a, and Theme Topic verbs have a theme subject, as in (4)b. The third voice is called Circumstantial Topic and almost any other non-core argument can be the subject (in (4)c it is an instrument).

(4)  a. Actor Topic (AT) – Subject is agent
Nanapaka ity hazo ity tamin’ ny antsy i Sahondra.
PST-AT-cut DEM tree DEM PST-withDET knife DET Sahondra
‘Sahondra cut this tree with the knife.’
b. Theme Topic (TT) – Subject is theme
   Notapahin’i Sahondra tamin’ ny antsy ity hazo ity.
   PST-TT-cut DET Sahondra PST-with DET knife DEM tree DEM
   ‘Sahondra cut this tree with the knife.’

c. Circumstantial Topic (CT) – Subject has some other role
   Nanapahan’i Sahondra ity hazo ity ny antsy.
   PST-CT-cut DET Sahondra DEM tree DEM DET knife
   ‘Sahondra cut this tree with the knife.’

As noted in the literature on Malagasy, each voice can be realized by a range of different forms. For example, active voice is associated with the prefixes mi-, man-, ma-, and maha-. In the literature, it is therefore standard to treat maha- as a voice marker and we will follow this tradition in this paper.

We follow most syntactic work on Malagasy and assume that there is a major constituent made up of the verb and its internal arguments; the clause-final subject appears to the right of this constituent (Keenan 1976). We follow Pearson (2005) and refer to this constituent as PredP. We provide a simplified syntactic representation in (5)b and (6)b for AT and TT sentences, respectively. To obtain verb-initial word order, we assume verb movement to T, but this movement is not shown in the trees.

(5) a. Nanapaka ity hazo ity i Sahondra.
   PST-AT-cut DEM tree DEM DET Sahondra
   ‘Sahondra cut this tree.’

   b. 
   
   (6) a. Notapahin’i Sahondra ity hazo ity.
   PST-TT-cut DET Sahondra DEM tree DEM
   ‘This tree was cut by Sahondra.’

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2 There is considerable debate in the literature over whether VOS word order should be derived via a rightward specifier as shown here (Guilfoyle et al. 1992) or via predicate fronting (Rackowski and Travis 2000 and many others). There is also debate concerning the status of what we call the subject, as either an A or A-bar element (see e.g. Pearson 2005). We set aside both of these debates as tangential to the analysis of maha-.
Both (5)a and (6)a are interpreted as non-culminating accomplishments. That is, they implicate, but do not entail the result state of the tree being cut.

3.0 Non-culminating accomplishments

Non-culminating accomplishments have been documented in a wide range of languages, including Mandarin (Koenig and Chief 2008), Thai (Koenig and Muansuwan 2000), several Salish languages (Bar-el et al. 2005, Jacobs 2011), and Tagalog (Dell 1983). Moreover, for a certain class of verbs, we can see the same effect in English and French (Martin and Schäfer 2012).

(7) a. Ivan taught me Russian, but I did not learn anything.
    b. Marie lui enseigna les rudiments du russe en deux semaines, et pourtant il n’apprit rien du tout.
       ‘Marie taught him the basics of Russian in two weeks and yet he didn’t learn anything at all.’

The literature on this topic has considered a number of facts about non-culminating accomplishments that we will now illustrate with data from Malagasy. Although Phillips (2000), Travis (2010), and Paul et al. (2015) discuss non-culmination, there is no single complete description available.

3.1 Failed attempt vs. partial success

As noted in particular by Tatevosov (2008), there are potentially two distinct non-culminating interpretations: what he calls failed attempt and partial success. On the first, the entire change of state does not take place, while on the second there is some change, but it is not complete. Both readings are possible with Malagasy Actor Topic verbs.3

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3 As mentioned by Rajaona (1972), Theme Topic and Circumstantial Topic verbs also allow non-culminating readings. For the purposes of this paper, we focus on Actor Topic in order to better compare with maha-, which is also active.
In other words, these predicates are compatible with a situation where there is no change of state (e.g. the door doesn’t open at all in (8)a). They are also possible in a situation where there is some change of state (the door is part-way open), but the complete change of state (the door being fully open) does not occur. On the other hand, verbs with maha- do not allow non-culminating readings, whether failed attempt (9)a or partial success (9)b.

The maha-predicates in (9)a and (9)b entail that the destruction of the house is completed. As a result, they are incompatible with a follow-up sentence that denies the result state. We now turn to the interpretation of the subject.

3.2 Agent control hypothesis
Demirdache and Martin (2015) note that the non-culminating reading correlates with agency. We can see this clearly in contrast between the French examples in (10).

In (10)a, the subject, Marie, is agentive and the non-culminating construal is possible. In (10)b, however, the subject is inanimate (and therefore non-agentive) and the non-culminating reading is not possible, giving rise to a contradiction. Demirdache and Martin (2015) note that this pattern is also observed in German, Mandarin, and Salish. To account for this correlation, they formulate the Agent Control Hypothesis (ACH):
(11)  
a. S-ACH (strong version)  
Zero result and partial result NC construals require the predicate’s external argument to be associated with ‘agenthood’ properties.

b. W-ACH (weak version)  
Zero result NC construals only require the predicate’s external argument to be associated with ‘agenthood’ properties.

We note here that what counts as “agenthood” varies across languages. In Romance, Germanic and Mandarin, there appears to be a correlation with animacy. In Salish, however, even animate/human subjects can be understood to be “non-agentive” with certain verb forms. These forms are called “limited-control” in Skwxwú7mesh (Jacobs 2011) and “non-control” in St’át’imcets (Davis et al. 2009) and are associated with a specific range of meanings (Thompson and Thompson 1992):

(12) Non-control  
   i. events which are natural, spontaneous-happening without the intervention of any agent;
   ii. events which are unintentional, accidental acts;
   iii. limited control, which is intentional, premeditated events which are carried out to excess, or are accomplished only with difficulty, or by means of much time, special effort, and/or patience, and perhaps a little luck.

With Malagasy Actor Topic verbs the non-culminating reading is always available, independent of the animacy of the subject.

(13) Nandoro ny tranoko ny afo nefa tsy may tanteraka.
    PST-AT-burn DET house-1SG DET fire but NEG burned completely
    ‘The fire burned my house but it isn’t burned completely.’

Thus both Skwxwú7mesh and Malagasy provide evidence that “agenthood” cannot be fully identified with animacy.  

Turning now to the culminating readings, as we have seen earlier in examples (2)a and (9), animate/human subjects are possible. On the other hand, as pointed out by Phillips (1996, 2000) and Travis (2010), maha- does impose certain restrictions on its subject. First, the subject must be understood as what Phillips calls a “stative causer”. She gives the following examples (Phillips 1996:45-46).

(14)  
a. # Mahatsara ny trano Rabe.
    PRS-AHA-good DET house Rabe

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4 For the second author of this paper, sentences with inanimate subjects of Actor Topic verbs are slightly marked, though not ungrammatical. We do not pursue this difference here, though it does highlight the level of “agency” associated with Actor Topic voice.
b. Mahatsara ny trano ny voninkazo.
   PRS-AHA-good DET house DET flowers
   ‘The flowers make the house beautiful.’

Phillips notes that (14)a is odd and can only be understood as Rabe’s beauty making the house beautiful. Travis (2010) pursues this line of inquiry and observes that verbs with maha-, unlike other active verbs, are incompatible with agent-oriented adverbs.

   PST-AT-do spirit TT-do.on.purpose PST-AT-fill bottle Rakoto
   ‘Rakoto deliberately filled bottles.’

    b. # Nanao fanahy iniana nahafeno tavoahangy Rakoto.
       PST-AT-do spirit TT-do.on.purpose PST-AHA-fill bottle Rakoto
       ‘Rakoto deliberately managed to fill bottles.’

Thus the key notion here is not animacy, but agency: the subject of a maha- must be non-agentive. Finally, although not reported in the literature, maha- also allows for readings where the subject does some action by accident (much like has been observed for Salish languages).

(16) a. Nahasotro poizina izy
   PST-AHA-drink poison 3
   ‘He drank poison’

    b. Nahatelina moka aho
       PST-AHA-swallow mosquito 1SG
       ‘I swallowed a mosquito.’

    c. Nahapetraka teo ambony tsilo i Soa
       PST-AHA-sit PST-LOC on thorn DET Soa
       ‘Soa sat on a thorn.’

The availability of the “accidentally” reading appears to depend on context. For example, (16)a most naturally has an accidentally reading. But in a context where the person is trying to commit suicide by drinking poison, the interpretation is ‘managed to drink poison’. The context-dep dependency supports Phillips’s (1996) claim that the different readings are manifestations of one underlying semantics.

3.3 The role of tense in triggering culmination
Before moving on to our analysis, we note the role of tense in culmination, a topic that has not received much attention in the literature (but see Matthewson 2012). As illustrated above in several examples, maha- gives rises to an entailment of culmination. The reader will have noticed, however, that all of our examples are in the past tense. As it turns out, in the present tense maha- does not entail a change of state (e.g. at least once in the past). Let us look more
closely at some examples – for ease of exposition, we gloss the m- prefix as present tense. In (17), the first clause simply states the ability of the wolf to kill goats and the second clause explicitly denies that the wolf has ever actually killed one.

(17) Mahafaty osivavy ny ambodia fa izy mbola tsy hamono fotsiny.
    PRS-AHA-dead goat DET wolf COMP 3 still NEG FUT-AT-kill yet
    ‘The wolf can kill a goat but it still hasn’t done so.’

The example in (18) is similar – it can be used to describe a car that has just come out of the factory and has never been driven.

(18) Mahaleha 200 km/hr ity fiarity.
    PRS-AHA-go 200 km/hr DEM car DEM
    ‘This car can go 200 km/hr.’

On the other hand, maha- in the future entails culmination, just like it does in the past.

(19) Hahatitra sakafo ho an’ ny reniny i Be
    FUT-AHA-send food ACC DET mother.3 DET Be
    #fa tsy ho raisiny ilay sakafo.
    COMP NEG FUT receive-3 DEF food
    ‘Be will be able to send food to his mother but she won’t receive the food.’

Any account of maha- must take into consideration these facts.

4.0 Maha- encodes double prevention

Recall that we want to account for culmination, as well as the range of interpretations displayed by maha-predicates (causation, ability, unintentionality, manage to reading). On the syntactic side, we take our starting point in the role of maha- as a morphologically complex functional predicate (Section 4.1). As we ground our semantics in the framework of causation and enablement developed by Wolff (2007, 2014) and Wolff et al. (2010), we introduce the theoretical setting in Section 4.2, and posit the hypothesis that maha- encodes double prevention in Section 4.3. Sections 4.4 and 4.5 develop the conceptual and compositional semantics of maha- for stative and eventive roots respectively. Section 4.6 works out the implications of the analysis for culmination in relation to past, present and future tense.

4.1 Maha- as a functional predicate

The analysis we work out in this section builds on core insights from Paul et al. (2015, 2016), but assumes a simpler mono-eventive lexical semantics for eventive roots. We take our inspiration from Phillips (1996, 2000) and Travis (2010), who analyze maha- as a functional predicate, akin to English experiencer or causative have in examples like (20):

(20) a. Mary had the students walk out on her.

5 In fact, the present tense is unmarked. The m- simply marks an active predicate and is deleted when the past and future prefixes (n- and h-, respectively) are added.
b. Mary had the students revise their papers twice.

What *have* and *maha*- have in common is that both introduce a relation between the external argument and a state or event embedded under the functional predicate. In contrast to English *have*, *maha*- does not encode experience or agentivity, because the external argument is construed as non-agentive. In Phillips’s terms, the external argument of a *maha*- phrase qualifies as a ‘stative cause’ (Phillips 1996:82, 92). But what is a stative cause?

Phillips treats *maha*- as a morphologically complex voice marker composed of two parts: *ma*- and *ha*. She assigns *ma-* the functional meaning of HAVE and *ha-* the meaning of BECOME, as illustrated in (21)a and b, that sketch the trees for (21)a and b:

(21)  

\[\text{a. Mahaongotra ravina amin' ny tanana Rabe.} \]

\[\text{PRS-AHA-pull.out roots with DET hand Rabe} \]

`Rabe can pull out roots with his hands.'

\[\text{b. Mahafinaritra an’i Soa Rabe.} \]

\[\text{PRS-AHA-happy ACC DET Soa Rabe} \]

`Rabe makes Soa happy.'

(22)  

\[\text{a.} \]

\[\text{b.} \]

The difference between eventive and stative roots plays a key role in Phillips’ analysis. The fact that Rabe is the external argument of a HAVE predicate makes the *maha*- verb stative. The BECOME predicate accounts for the causative meaning component of *maha*- that Phillips takes to underlie both the ability reading in (21)a and the causative reading associated with stative roots in (21)b. Interestingly, the causative reading of English *have* in (20)b implies that the inner argument (the students) carry out the action, while the external argument (Mary) is responsible
for making it happen. This is not the case in Malagasy, where the two roles are assigned to the same argument (the external DP). In order to capture the special nature of the external argument, Travis (2010: 224) takes *maha-* to exceptionally assign a theta role in Spec of AspP. This leads to the structure in (23):

(23)

According to Travis, the theta role assigned to the DP in Spec of AspP depends on the nature of the root: states don’t have argument structure, so stative roots discharge a default causative argument, which leads to the causative reading in (21)b. Discharging the Agent role of eventive roots in Spec of AspP leads to the ability reading in (21)a. In what follows, we adopt the morphological analyses of Phillips and Travis and separate *maha-* into two morphemes, *ma-* and *ha-*. We follow Travis in having the theme argument of the root introduced low, below *ha-*. But we follow Phillips in merging the external argument above *ma-*. The relevant structures will be presented in sections 4.4 and 4.5 below.

Building on the analysis of *maha-* as a functional predicate proposed by Phillips and Travis, we make it our primary aim to work out the semantics of *maha-*. We do this in the framework of Wolff’s (2007, 2014) force-theoretic framework of causation, introduced in the next subsection.

4.2 A more fine-grained theory of causation and its relevant for *maha-*. Analyses of non-culminating accomplishments typically rely on the external argument being the agent of the action (see Section 3.2). As accomplishments imply a cause relation, this is naturally tied in with the view that causation requires agentivity (see the overview in Copley & Wolff 2014). This approach has led to investigations of the (quasi) agentive behaviour displayed by inanimate objects in causative constructions, as illustrated in (24).

(24) a. John/The book had Mary laugh.
b. The sidewalk was warm from the sun.

There is surprisingly little discussion in the literature on the inverse pattern, that is, relations that look similar to causation, but crucially rely on non-agentivity. But *maha-* seems to do exactly

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6 Travis (2010, 2016) provides arguments based on morphology for positing the lower position. We leave this issue for future research.
that. As pointed out in Section 3.2 above, (25)a is infelicitous unless somehow the house looks beautiful with Rabe in it:

(25) a. #Mahatsara ny trano Rabe.
    PRS-AHA-good DET house Rabe

b. Mahatsara ny trano ny voninkazo.
    PRS-AHA-good DET house DET flowers
   ‘The flowers make the house beautiful.’

Most of the philosophical and linguistic literature on causation focuses on agentive configurations like the ones in (24), but the fact that maha- is inherently non-agentive, as illustrated in (25) requires us to look beyond the standard analyses of causation. Note further that maha- does not necessarily imply causation, but can also convey enablement or unintentionality, so its analysis requires a more fine-grained picture of causation. We introduce here the framework developed by Wolff (2007, 2014) and Wolff et al. (2010), which elaborates earlier ideas on the conceptual structure of causation relations by Talmy (1988, 2000).

Wolff and colleagues distinguish three main configurations, labeled CAUSE, HELP and PREVENT. All three are defined in terms of two-place relations between an affector (A) and a patient (P). The relations are analyzed in a force-theoretic framework in which forces are framed as vectors. Directional forces are associated with both affectors and patients, while the endstate (E) is a positional vector. When a patient has a tendency towards an endstate, the patient vector points towards the endstate, otherwise it points in a different direction. When the patient and the affector are in concordance, their vectors point in the same direction. Summing up the patient and the affector produces the resultant vector (R). CAUSE, HELP and PREVENT differ in the interactions between A and P, and thereby have an impact on R.

In a CAUSE configuration, the patient P does not have a natural tendency towards the endstate, the affector A opposes this tendency, and the resultant R points towards the endstate. In a PREVENT configuration, the patient has a natural tendency towards the endstate, the affector opposes this tendency, and the resultant does not point towards the endstate. In a HELP configuration, the patient has a natural tendency towards the endstate, the affector concords with this tendency, and the resultant is towards the endstate. The HELP configuration comes into play in ENABLEMENT and ALLOW relations. Figure 1 (from Wolff et al. 2010: 195) illustrates the three configurations:

Classical causation as illustrated in (24) is captured by the CAUSE relation in Figure 1: Mary wouldn’t have laughed, if it weren’t for John (or the book). The causative reading of maha- in
(25) rather illustrates the help configuration in Figure 1: the room has a natural tendency to look beautiful, but something is missing, and the presence of some decoration (like flowers, or Rabe’s natural beauty) helps it to reach the endstate. The basic intuition that help and enablement are variants on causation makes Wolff’s framework an attractive set-up for us to dig deeper into the semantics of maha-. As we hypothesize that maha- encodes a double prevention relation, we zoom in on this more complex configuration next.

4.3 Zooming in on double prevention
According to Wolff et al. (2010), enablement or allow relations are often complex in that they rely on the composition of two prevention relations. An example illustrates. If a plug in the sink prevents the water from flowing down the drain, an agent who removes the plug from the sink, prevents the plug from doing its prevention work, so we can say that the agent allows (or enables or helps) the water to flow down the drain. In order to account for the role of the plug in the situation described, we need to model the enablement relation in terms of a composition of two prevention relations, called a double prevention configuration. A enables C is then modelled as A prevents B, B prevents C.

One of the interesting features of the prevent relation is that it doesn’t require events: the state of the plug being in the sink prevents the water from flowing down the drain, and no input of energy is needed. Wolff’s system also explains how absences can lead to changes in the world, as in ‘lack of water caused the plant to die.’ An analysis in terms of double prevention runs as follows: water prevents the plant from dying, but if no water reaches the plant, the one thing that prevented the plant from dying is prevented, and the plant dies.

Double prevention relations are modeled in Figure 2 (from Wolff et al. 2010). The patient force in the conclusion is based on the factor addition of the patient forces in the two premises. Whether double prevention relations lead to enablement or causation depends on the strength of the patient tendencies in each of the prevention relations. In Figure 2, short arrows represent weak forces, while long arrows model strong ones:

Figure 2: the composition of two prevent relations can either lead to an allow (or enable) conclusion (left part) or to a cause conclusion (right part)

The strength of the patient vectors is grounded in world knowledge or knowledge of the specific situation at hand. Water has a strong tendency to flow, so we posit a strong patient vector. However, plugs are fairly inert, so we take the patient vector of the plug to be weak. Composition of these two vectors leads to an enablement relation, where the agent removing the
plug helps the water to freely run its course (left part of Figure 2). In contrast, plants are resilient, and have a weak tendency to die. But if no water can reach the plant, this has a major impact in the long run, so lack of water is construed as cause of death, rather than a helping hand (right part of Figure 2).

On a psychological level, recognizing a PREVENT relation involves counterfactual reasoning in the sense that one needs to envision what would happen in the absence of the blocking event. This raises the possibility that the second prevention in the chain need not actually occur, but may be anticipated, if the early parts in the causal chain make it possible to anticipate the later ones. In order to test the psychological reality of such virtual forces, Wolff et al. (2010) carried out experiments with closely related animations involving actual and virtual forces. For instance, in one animation a car A approaches a line, a car B approaches the line from the opposite direction and prevents B from crossing the line (actual force). In another animation, car A approaches a line, car B approaches the line from the opposite direction, but stops at the last moment, and A crosses the line. Participants in the experiment interpret this animation as ‘B allows A to cross the line’, where in reality it is the absence of B’s blocking A that allows A to cross the line. So in various ways, causation can be based, as Wolff (2014:112) says, “not only on transmission, but also on removal of an actual force or threat of a virtual preventive force”, especially in instances of double prevention. It is this intuition that we build on for the conceptual structure of maha-.

As for its linguistic realization, we observe that English lacks an expression specifically encoding the double prevention relation. This lexical gap leads Wolff and his colleagues to investigate a range of situations in which the double prevention configuration is realized through the different labels of enablement, causation and allow relations. Their experiments reveal the conceptual reality of the enablement/allow/help configuration, even though there is no single English expression for it. We hypothesize that double prevention is precisely what maha- encodes, and the range of readings that have been associated with maha- in the literature are nothing but attempts to paraphrase that particular configuration in a language like English. The details are worked out in the following two subsections.

4.4 Conceptual structure and the syntax-semantics interface of maha- with stative roots

The five core readings of maha- distinguished in the literature are the general ability reading in (26)a, the specific ability under adverse conditions (‘manage to’) reading in (26)b, the accidental (unintentional) reading in (26)c, the enablement reading in (26)d, and the causative reading in (26)e.

(26) a. Mahafaty osivavy ny ambodia.    [general ability]
    PRS-AHA-dead goat DET wolf
    ‘The wolf can kill a goat.’

    b. Nahasambotra alika io zaza io.    [manage to]
    PST-AHA-catch dog DEM child DEM
    ‘This child managed to catch a dog.’
c. Nahapetraka teo ambony tsilo i Soa [unintentionality]
PST-AHA-sit PST-LOC on thorn DET Soa
‘Soa sat on a thorn

d. Mahatsara ny trano ny voninkazo. [enablement]
PRS-AHA-good DET house DET flowers
‘The flowers make the house beautiful.’

e. Mahafinaritra an’i Soa Rabe. [causation]
PRS-AHA-happy ACC DET Soa Rabe
‘Rabe makes Soa happy.’

There is a fairly strong tendency for maha- sentences with eventive roots to imply external DPs with animate reference (26)a-c, and for stative roots to imply inanimates (26)d. But there are exceptions, as seen in (25) and (26)e, so the five readings do not strictly correlate with animacy. Rather, they depend on the nature of the root: the general ability, manage to and accidental readings appear with eventive roots, whereas the enablement and causative readings arise with stative roots. We claim that all readings derive from the semantics of double prevention, and show that the interaction of maha- with stative and eventive roots leads to different conceptual configurations, as previously noted by Phillips (1996, 2000). We start with the stative roots, and postpone the analysis of eventive roots until Section 4.5.

Enabling and causative readings with stative roots typically rely on the virtual force of absences as the intermediate patient (B). The conceptual structure of (26)d reads as: the flowers (A) prevent the absence of decoration (B); the absence of decoration (B) prevents the room from looking beautiful (C). The representation in Figure 3 uses single arrows (→) to represent weak forces, and double arrows (⇒) for strong forces. Grey arrows (→) visualize that the endstate need not be reached. The resultant force R is represented (in red) as ⇒.

(26)d The lack of decoration (B) has a weak tendency towards ugliness (E’), but the presence of the flowers (A) prevents lack of decoration, and the resultant is an orientation away from E’.

The room (C) has a strong tendency towards beauty (E), and the lack of decoration is the preventor B that orients C away from beauty.

The presence of the flowers (A) overcomes the tendency away from beauty (E) that was the result of the lack of decoration (B), so the flowers enable the house to look beautiful.

Figure 3: enablement with stative roots

Similarly, the conceptual structure of (26)e is as follows: Rabe (A) prevents the absence of companionship (B); the absence of companionship (B) prevents Soa from being happy (C).
Lack of companionship (B) has a strong tendency towards solitude (E'), but the presence of Rabe (A) orients the resultant arrow away from E'.

Soa (C) has a weak tendency towards happiness (E), where E is incompatible with E'; lack of companionship (B) orients the resultant arrow away from E.

Rabe’s companionship (A) causes the virtual force of lack of companionship leading away from happiness (E) to be overcome, so Rabe makes Soa happy.

Figure 4: causation with stative roots

In both cases, the B argument remains implicit, and its nature is reconstructed as an affector that prevents the situation described by the stative root to arise for the inner argument (C), and is itself prevented by the external argument A. The most natural interpretation of (26)d is to associate B with lack of decoration, and for (26)e the interpretation of lack of companionship suggests itself. Note that both are to be construed as virtual forces, rather than actual forces, in line with the counterfactual reasoning that underlies double prevention configurations in general (see Section 4.3 above). Crucially, maha- sentences convey that A is successful in overcoming any difficulties that prevent C from arising, so whichever value B takes up in the context, A prevents B, and enables or causes C to reach the endstate E (beauty in (26)d, happiness in (26)e). The formal analysis below accounts for reaching the endstate by bringing the variable introduced by the lower prevent relation under the scope of a universal free choice quantifier introduced by the higher prevent relation.

Now that the conceptual structure of the double prevention configuration in maha- sentences is clear, we can work out the compositional build-up at the syntax-semantics interface. Combining the insights of Phillips (1996, 2000), Travis (2010), and Paul et al. (2016), we propose the syntactic structure in (27)b for (26)e, repeated here as (27)a. In line with Phillips (1996, 2000) and Travis (2010), we take maha- to enrich the argument structure of the verb, and create a two-place predicate out of a stative root.\footnote{As noted earlier, we assume head movement derives verb-initial word order, but this is tangential to the semantic analysis of maha-.}

(27) a. Mahafinaritra an’i Soa Rabe.
    PRS-AHA-happy ACC DET Soa Rabe
    ‘Rabe makes Soa happy.’

---

\footnote{As noted earlier, we assume head movement derives verb-initial word order, but this is tangential to the semantic analysis of maha-.}
Semantically, ma- and ha- each contribute a prevention relation, their combination establishing a double prevention relation between the external argument (the affector A), a virtual force (B), and the situation variable of the stative root (C). We work this out in the stepwise derivation in (28). We assign a simple, mono-eventive structure to roots, and take stative roots to denote one-place predicates over states (28)b. When finaritra combines with Soa, it denotes a relation between a state of happiness and Soa as its theme (28)c. Ha contributes the lower prevent relation in (28)d. Application of ha to the VP leads to (28)e, which conveys that there is something that prevents Soa from being happy, where z is typically construed as a virtual force.

(28) Mahafinaritra an’i Soa Rabe.

PRS-AHA-happy ACC DET Soa Rabe
‘Rabe makes Soa happy.’

a. [TP [PredP ma [AspP ha [VP [DP Soa [√ happy]]]]] [DP Rabe]]
b. [[finaritra]] : λyλs[happy(s) & theme(y,s)]
c. [[finaritra Soa]] : λs[happy(s) & theme(Soa,s)]
d. [[ha-]]: λPλs[P(s) & ∃z.prevent(z,s)]
(Where P is a stative predicate)
e. [[ha-finaritra Soa]] : λs[happy(s) & theme(Soa,s) & ∃z.prevent(z,s)]
f. [[ma-]]: λP’xλs[P’(s) & ∀Fcz’[prevent(z’,s) → prevent(x,z’)]]
(Where P’ is a ha-predicate, with ha- as defined in d)
g. [[ma-ha-finaritra Soa]] : λs[happy(s) & theme(Soa,s) & ∃z.prevent(z,s) & ∃Fcz’[prevent(z’,s) → prevent(x,z’)]]
h. [[Ma-ha-finaritra an’i Soa Rabe]]:
λs[happy(s) & theme(Soa,s) & ∃z.prevent(z,s) & ∀Fcz’[prevent(z’,s) → prevent(Rabe,z’)]]
Ma contributes the higher prevent relation in (28)f. As the higher prevent relation prevents any possible value of the lower prevent relation from blocking the reaching of the endstate, we take ma- to imply a free choice meaning component. In (28)f, this is spelled out by bringing the variable $z$ introduced by the lower prevent relation under the scope of a free choice quantifier ($\forall_{FC}$). Dayal (1998) argues that free choice items are inherently intensional, so in line with her proposals, $\forall_{FC}$ is to be read as a universal quantifier over virtual forces across possible worlds ($\forall z \forall w$). Combination with the VP leads to (28)g, and further combination with the external DP to (28)h. The interpretation in (28)h claims that Rabe prevents whatever virtual force that might prevent Soa from being happy in situation $s$. In other words, Soa is happy thanks to Rabe’s removal of all actual or virtual threats to her happiness.

The syntax-semantics interface of (26)d is identical to that of (26)e, the difference between enabling and causative maha- with stative roots being handled by the conceptual component, as illustrated in Figures 3 and 4. We now turn to the syntax-semantics interface of maha- with eventive roots, which extends the analysis of stative roots developed so far.

### 4.5 Conceptual structure and syntax-semantics interface of maha- with eventive roots

Before we develop the formal syntax-semantics interface, we lay out the conceptual structure of the double prevention configuration of maha- sentences with eventive roots. We start with the ‘manage to’ reading of (2)b (repeated in (26)b above and (29) below).

(29) Nahasambotra alika io zaza io.
    PST-AHA-catch dog DEM child DEM
    ‘This child managed to catch a dog.’

The conceptual structure of (29) is a double prevention configuration in which there is some $B$ that prevents the child from catching the dog ($C$) - maybe the dog is big and fast, and the child is small in comparison. The higher prevention relation indicates that the child ($A$) did something to remove the threat of the virtual force $B$ (maybe it ran harder than anyone would have expected). The end state is that the child removed the prevention on her catching the dog, in other words,

---

8 The derivation in (28) relates the morphological decomposition of maha- to the compositional buildup of the double prevention configuration. Alternatively, we could use Chierchia’s (2006, 2013) analysis of universal free choice items to capture the meaning of maha- without morphological decomposition into $a$- and ha-. Chierchia’s anti-exhaustivity operator $O'$, defined in (i)a, constitutes the basis for the semantics of maha- in (i)b. Informally, this would lead to the meaning in (i)c for (28).

(i) a. $O_c (p) = p \& \forall q, q' \in C[q \rightarrow q']$, where $C$ constitutes the set of alternatives for $p$.
   b. $\langle [aha-] \rangle : \lambda P, x, s[P(s) \& O' [\exists z. prevent(z, s) \& prevent(x, z)]]$
   c. $\forall z, z$ a possible (virtual) force preventing Soa from being happy, Rabe prevents $z$.

Chierchia defines the anti-exhaustivity operator as the implementation of Dayal’s (1998) analysis in his framework, so the equivalence between (i)c and (28)h need not come as a surprise. As Phillips and Travis emphasize the morphological complexity of maha-, we maintain the approach in (28), rather than the alternative in (i). In order to keep the formulas readable, we keep using $\forall_{FC}$ and refrain from spelling out the full modal semantic details.
she managed to catch the dog. We characterize this configuration as special ability under adverse conditions, and analyze it conceptually as follows:

(29) There are strong virtual forces (the dog is big and strong) (B) oriented towards escape (E’), but the child’s special action (it running faster than anyone would have predicted) (A) orients the resultant arrow away from E’.

The dog (C) has a weak tendency towards capture (E); inherent features of the dog (it is big and strong) (B) orient the resultant arrow away from E.

The child’s special action (A) causes the virtual force of the dog’s escape (B) leading away from E to be overcome, and for the dog to be oriented towards capture (E), so the child manages to catch the dog.

Figure 5: ‘manage to’ reading with eventive roots

The ‘manage to’ reading of (29) mirrors the representation of the causative reading of the stative root (26)e in Figure 4 above. The schematic representation of the general ability reading (26)a mirrors the enablement structure of (26)d in Figure 3 above. Malagasy lacks a separate verb ‘to be able to’, and uses a maha- configuration to report general ability, the underlying structure of which is: A has certain features, which entities otherwise similar to A lack, and the lack of these features constitutes the B that prevents C. Figure 6 spells out this conceptual structure in force-theoretic terms:

(26) Lack of strength and speed in predators (B) has a weak tendency towards leaving larger animals of prey like goats alive (E’), but the wolf’s nature as a strong and fast predator (A) prevents such lack of strength and speed, and the resultant is an orientation away from E’.

The goat (C) is an animal of prey that has a strong tendency towards death by predators (E) (E incompatible with E’), but it requires some strength and speed for a predator to kill a goat, and lack of those features (B) orients the goat away from death.

The wolf’s nature as a strong predator (A) overrides the lack of strength and speed that prevents other predators from killing the goat (B), so the wolf is able to kill the goat (but a domestic cat isn’t, even though it qualifies as a predator, because it kills mice, squirrels, rabbits, etc.).

Figure 6: general ability with eventive roots
The unintentional reading of (26)c implies that Rabe would normally not sit on a thorn, that is, common sense would normally guide him towards careful behavior. But in this special case, maybe it was dark, or he wasn’t as attentive as he normally is, so he didn’t notice the thorn, or didn’t identify the object as a thorn, in other words, Rabe missed whatever crucial piece of information that prevented his common sense from preventing him from making a mistake, and as a result, he accidentally sat down on a thorn. The conceptual structure in Figure 7 reflects that Rabe’s sitting on a thorn is caused by his own inattention or mistakes in judgment:

<table>
<thead>
<tr>
<th>(26)c Rabe’s common sense (B) has a strong tendency towards sensible behaviour (E’), but lack of attention, visibility or other mistakes in judgment (A) orient the resultant arrow away from E’.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rabe (C) has a weak tendency towards sitting on a thorn (E), where E is incompatible with E’; common sense (B) orients the resultant arrow away from E.</td>
</tr>
<tr>
<td>Rabe’s inattention or mistakes in judgment (A) causes the virtual force of common sense leading away from E to be preempted, and for Rabe (C) to be oriented towards sitting on a thorn (E), so Rabe accidentally sits on a thorn.</td>
</tr>
</tbody>
</table>

Figure 7: unintentionality with eventive roots

The three readings all build on a double prevention relation, but they vary in the force of the patient vector. The manage to and accidental readings rely on a causative structure, which implies a strong B vector that A needs to overrule. The general ability reading in contrast relies on a weak B vector, and implies an enablement structure. The general ability and unintentional reading share a role for the external argument in the B vector. For the general ability reading, the specific features of the external argument are needed compared to other entities in the same general category (wolf in contrast to other predators in (26)b), so in a sense, the wolf enables itself to kill the goat. For the accidental reading, the B vector directly implies the common sense of the external argument (Rabe in (26)c), so Rabe caused himself to sit on a thorn. In contrast, the manage to reading assigns an important role to characteristics of the inner argument in the B vector (the size and speed of the dog in (29)), so the child overcomes the patient force of the dog, and causes the dog to get caught. Interestingly, eventive roots do not lead to an enablement structure whereby the external argument enables the inner argument to be in a certain endstate. This configuration is reserved to stative roots, as in the flowers enabling the room to look beautiful. The syntax-semantics interface we work out for the composition of maha- accounts for the unavailability of this configuration, as we will see below.

By way of illustration, we spell out the syntax-semantics interface of the ‘manage to’ reading. The tree in (30)b provides the syntactic structure of (30)a:

    PST-AHA-catch dog DEM child DEM
    ‘This child managed to catch a dog.’
The tree in (30)b is very similar to the one in (27)b, so there are essentially no syntactic differences between *maha*-sentences with stative or eventive roots. The semantic composition is slightly different, though. Recall that the distinction between eventive and stative roots in Malagasy is construed as a contrast between intransitive stative roots and transitive eventive roots. If eventive roots are transitive, they denote a two-place relation between an agent and a theme. As we want to stay as close as possible to the semantics of *ma-* and *ha-* as defined in (27), and *ha-* as defined in (28)d operates on intransitive roots, we turn the eventive root into a one-place predicate. There are various ways to do that, but we choose Montague’s quantifying in approach, because we know that interpretation of the Agent role is postponed until *ma-* comes in, as we see in the syntactic tree in (30)b. Informally, the syntax of quantifying-in replaces the Agent role with an indexed pronoun *he*. The indexed pronoun binds off the argument slot, just like a regular pronoun would do, so the result of applying this to the eventive root *sambotra* is the intransitivized counterpart of the eventive root in (31)c. Combination with the inner argument leads to the set of events e such that $x_i$ catches the dog in event $e$ (31)d. The prefix *ha-* can now operate on this intransitive root, and adds the lower prevent relation in (31)e.

With stative roots, *ha-* prevents the state denoted by the root from arising, as we saw in (28)d above. With eventive roots, *ha-* targets the change of state, so it prevents the event $e$ from culminating, written here as Cul($e$). Application of *ha-* to the VP in (31)f conveys that there is something that prevents the dog from getting caught by $x_i$.

(31) Nahasambotra alika io zaza io.
    PST-AHA-catch dog    DEM child DEM
    ‘This child managed to catch a dog.’
(26) The differences in argument structure, and the contrast between states and configurations that arise out of the various double prevention configurations, and depend on the force of patient vectors reflecting the interactions between the inner and outer argument. So the syntax-semantics interface of the three sentences in (26)a-c is exactly the same: in all cases maha- introduces a double prevention configuration where the DP external to the PredP provides the Agent of the event, and removes whatever virtual force that prevents the event from culminating.

The analysis in (31) explains why maha- sentences with eventive roots do not lead to an enablement structure whereby the external argument enables the inner argument to be in a certain endstate, in a way that we find it with stative roots (see Figure 3). In other words, (31) does not mean ‘This child enabled the dog to be caught’. The enablement configuration does not identify the affector of the higher prevent relation with the Agent role of e, so the missing reading supports the recycling of x₁ by the application of ma- in (31)g.

4.6 Implications of the double prevention relation for culmination
Sections 4.4 and 4.5 together provide the conceptual structure and compositional semantics of maha- and illustrate how ha- and ma- interact with stative and eventive roots in slightly different ways, because of the differences in argument structure, and the contrast between states and
events. At the same time, ma- and ha- share a common core: in both cases, ha- introduces the lower prevent relation, and ma- the higher one.

The higher prevent relation implies a free choice universal quantifier, \( \forall_{FC} \), that ranges over individuals across possible worlds (\( \forall x \forall w \)). We refrain from spelling out the details of the modal semantics here, but quantification over possible worlds obviously requires interpretation with respect to a conversational background. We maintain that the free choice reading introduced by maha- relies on a circumstantial modal base: whether they report on actual or virtual forces, the two prevent relations imply possibilities that fit into the normal development of the real world. In that sense, maha- is different from a modal verb like tsy maintsy in Malagasy, which, just like its English counterpart, varies in modal base depending on the conversational background relevant in the context (data from Rajaona 1972:322).

(32) a. Tsy maintsy hajaina ny ray aman-dreny. [deontic]  
must TT-respect DET father with-mother.3  
‘One’s parents must be respected.’

b. Tsy maintsy mianjera io trano io fa mivava. [epistemic]  
must PRS-AT-fall DEM house DEM COMP PRS-AT-crack  
‘This house must fall down because it is cracked.’

In sum, maha- has an inherently modal meaning component, because it takes into account virtual forces, and includes a free choice universal quantifier ranging over entities across possible worlds. Yet it does not qualify as a modal verb, because the modal meaning is a side effect of the double prevention configuration, and does not allow for variation in conversational background - it necessarily implies a circumstantial modal base.

Building on Matthewson (2012) and Martin & Schäfer (2012), Paul et al. (2015, 2016) identify the circumstantial modal base as a key ingredient of maha-’s potential to induce culmination: if culmination with eventive roots holds in all possible worlds in the modal base, and the set of possible worlds quantified over includes the real world, as is the case with a circumstantial modal base, culmination is enforced by assertion of the event. We will show now that this explains why maha- sentences in the past tense entail culmination, as illustrated by (33) (repeated from (2)b):

(33) Nahasambotra alika io zaza io # nefə faingana loatra ilay alika  
PST-AHA-catch dog DEM child DEM but fast too DEF dog  
ka tsy azony. COMP NEG do-3  
‘This child managed to catch a dog #but it was too fast, so it didn’t get caught by him.’

In line with standard assumptions in the literature on tense and aspect, we assume that the past tense operator introduces a reference interval \( r \) preceding the speech time \( \text{now} \) (\( r < \text{now} \)). According to Paul et al. (2015, 2016), Malagasy does not encode grammatical distinctions like perfective/imperfective in its grammar, so we follow the conclusion we reached there, which is that lexical aspect (also called Aktionsart or situational class) drives the anchoring of stative and
eventive roots to the time axis. Following standard assumptions in the literature on aspect, we take events to be included in the reference time \( r (e \subseteq r) \), while states include the reference time \( (r \subseteq s) \). Putting these assumptions together explains the pattern in (33), as worked out in (34).

The compositional semantics of (26)b is spelled out in (31) above. We repeat the last step of (31)i in (34)a. Application of the past tense operator completes the derivation and leads to the final interpretation in (34)b:

(34) Nahasambotra alika io zaza io.

PST-AHA-catch dog DEM child DEM
‘This child managed to catch the dog.’

a. [[ma-ha-sambotra alika io zaza io]]: \( \lambda e x y [\text{catch}(e) \& \text{theme}(y,e) \& \text{dog}(y) \& \text{agent}(x,e) \& \text{child}(x) \& \exists z . \text{prevent}(z, \text{Cul}(e)) \& \forall FC z' [\text{prevent}(z',e) \rightarrow \text{prevent}(x,z')]] \)

b. [[na-ha-sambotra alika io zaza io]]: \( \exists e \exists r \exists x y [\text{catch}(e) \& \text{now} < r \& e \subseteq r \& \text{theme}(y,e) \& \text{dog}(y) \& \text{agent}(x,e) \& \text{child}(x) \& \exists z . \text{prevent}(z, \text{Cul}(e)) \& \forall FC z' [\text{prevent}(z',e) \rightarrow \text{prevent}(x,z')]] \)

\( \text{Maha-} \) encodes that the child is successful in removing all and any virtual forces that could prevent culminating of the catching event (34)a. The past tense operator induces existential closure over the event variable \( e \) and places this event at a time before the speech time (34)b. As the event is located in the past, and a circumstantial modal base ranging over realistic possibilities in the real world underlies the double prevention configuration operating on \( e \), culminination of \( e \) is entailed.

Example (19) in Section 3.3, repeated here as (35) illustrates that \( \text{maha-} \) has the same culminating effect in the future tense. The main problem with the future is lack of epistemic access, which has led to many different formal analyses (temporal, modal, and a mixture of temporal and modal reference). Modulo epistemic fine-tuning, sentences like (19) should get the semantics in (35) with the projection of \( r \) at a time later than the speech time.

(35) Hahatitra sakafo ho an’ny reniny i Be #fa tsy ho raisiny ilay sakafo.

FUT-AHA-send food ACC DET mother.3 DET Be COMP NEG FUT receive-3 DEF food
‘Be will be able to send food to his mother but she won’t receive the food.’

a. [[ha-ha-titra sakafo ho an’ny reniny ilay]]: \( \lambda e \exists y [\text{send}(e) \& \text{theme}(y,e) \& \text{food}(y) \& \text{agent}(Be,e) \& \exists z . \text{prevent}(z, \text{Cul}(e)) \& \forall FC z' [\text{prevent}(z',e) \rightarrow \text{prevent}(Be,z')]] \)

b. [[ha-ha-sambotra alika io zaza io]]: \( \exists e \exists r x y [\text{catch}(e) \& \text{now} < r \& e \subseteq r \& \text{theme}(y,e) \& \text{dog}(y) \& \text{agent}(x,e) \& \text{child}(x) \& \exists z . \text{prevent}(z, \text{Cul}(e)) \& \forall FC z' [\text{prevent}(z',e) \rightarrow \text{prevent}(x,z')]] \)

As the agent prevents any virtual forces standing in the way between him and the result state, a proper epistemic embedding of the condition \( \text{now} < r \) should allow us to project reaching of the result state in the future as well as in the past.

Recall that \( \text{maha-} \) always induces culmination in the past and future tenses, but not necessarily in the present tense. For present tense sentences, the distinction between stative and eventive roots
comes into play. Following standard assumptions in the literature, we take the present tense operator to include the speech time in the reference interval \( \text{(now \subseteq r)} \). For stative roots, we illustrate with \((26)e\), repeated here as \((36)\). The compositional semantics of \((26)e\) is spelled out in \((28)\) above. \((36)a\) repeats the final step \((28)h\); adding the tense operator leads to the final interpretation in \((36)b\):

\[
(36) \quad \text{Mahafinaritra an’i Soa Rabe.} \\
\text{PRS-AHA-happy ACC DET Soa Rabe} \\
\text{‘Rabe makes Soa happy.’} \\
a. \quad [[\text{ma-hafinaritra an’i Soa Rabe }]: \lambda s[ \text{happy}(s) \& \text{theme}(Soa,s) \& \exists z. \text{prevent}(z,s) \& \forall FC \ z’[ \text{prevent}(z’,s) \to \text{prevent}(Rabe,z’)]]] \\
b. \quad [[\text{ma-hafinaritra an’i Soa Rabe }]: \exists s \exists r[ \text{happy}(s) \& \text{now} \subseteq r \& r \subseteq s \& \text{theme}(Soa,s) \& \exists z. \text{prevent}(z,s) \& \forall FC \ z’[ \text{prevent}(z’,s) \to \text{prevent}(Rabe,z’)]]]
\]

Interpretation of the present tense operator induces existential closure over the state variable \( s \). As \( s \) includes \( r \), and \( r \) includes \text{now}, \( s \) holds at the speech time. \text{Maha-} does not play a role in inducing culmination, because states just hold, they don’t culminate.

Lack of culmination with eventive roots in present tense \text{maha-} sentences leads to general ability and dispositional readings, as we saw in relation to \((17)\) and \((18)\) in Section 3. Similarly, the present tense counterpart of \((34)\) in \((37)\) states that the child has the ability to catch a dog, and does not entail that he has done so. The event structure in \((34)a\), repeated in \((37)a\) provides us with the set of events such that the child removes whatever virtual force that could prevent him from successfully catching the dog.

\[
(37) \quad \text{Mahasambotra alika io zaza io nefa faingana loatra ity alika ity ka tsy azony.} \\
\text{PRS-AHA-catch dog DEM child DEM but fast too 3 DEM child DEM COMP NEG done-3} \\
\text{‘This child can catch a dog but this dog is too fast so he wasn’t able to.’} \\
a. \quad [[\text{ma-ha-sambotra alika io zaza io nefa}]: \lambda e x \exists y[ \text{catch}(e) \& \text{theme}(y,e) \& \text{dog}(y) \& \text{agent}(x,e) \& \text{child}(x) \& \exists z. \text{prevent}(z,Cul(e)) \& \forall FC z’[ \text{prevent}(z’,e) \to \text{prevent}(x,z’)]]]
\]

The present tense operator does not apply to \((37)a\), because it is not aspectually neutral, as the past and future are. Comrie (1976) drew the typological generalization that (simple) present tenses are never perfective, but always imperfective. A reformulation of the generalization in terms of lexical aspect states that accomplishments and achievements cannot be located at the speech time, only states and processes can. In English, this restriction is reflected in the infelicity of sentences like \((38)a\), in contrast to either the progressive \((38)b\) or the stative \((38)c\):

\[
(38) \quad \text{a. } \# \text{This child catches a dog.} \\
\text{b. The child is catching a dog.} \\
\text{c. The child is able to catch a dog.}
\]

In languages without a grammaticalized progressive, simple present tense sentences with accomplishments are generally not ungrammatical, but shift their meaning to the process reading that English captures by the progressive \((38)b\). We observe this in languages closely related to
English, such as German and French, and we hypothesize that this aspectual meaning shift also happens in Malagasy with present tense sentences in AT or TT, that typically describe ongoing events (what Rajaona 1972 calls “durative”), as illustrated in (39):

(39) Misambotra alika io zaza io.  
    PRS-AT-catch dog DEM child DEM  
    ‘This child is catching a dog.’

With maha-, we also get an aspectual shift, but not towards the ongoing process in (38)b, but to the stative reading in (38)c. We know from Section 4.5 that self-enablement is one of the possible interpretations of maha- with eventive roots, so the sentence shifts to a general ability or dispositional meaning similar to English (38)c, thanks to the double prevention configuration. Dispositional sentences are intentional, just like generics and habituals, so their semantics is inherently modal.

Building on Dahl (1975), Menendez-Benito (2005) analyzes dispositional sentences in terms of possibilities, i.e. existential quantification over possible worlds. The dispositional reading of (37) then reads as ‘there is an alternative possible world compatible with the child’s features in which he catches a dog’. The possibility reading does not require that the child has ever caught a dog in the real world so far, so the dispositional reading is weaker than a standard habitual reading (which would require the child to have caught a dog at least once), or a universal generic reading (which would require the child to catch a dog any time she sees one). However, not just any accidental circumstances under which the dog is caught qualify as support for the dispositional reading. As Menendez-Benito argues, the dispositional reading requires a circumstantial modal base that takes into account inner dispositions or ‘mental programming’ of the subject rather than outside circumstances. We do not spell out the formal details of the dispositional reading, but simply represent it as ◊, and refer to Menendez-Benito (2005) for further discussion. In order to allow the present tense operator to anchor the dispositional reading to the time axis, we take it to trigger a shift from events to states s in which the disposition for e holds, as spelled out in (40)a.

(40) Mahasambotra alika io zaza io nefa faingana loatra  
    PRS-AHA-catch dog DEM child DEM but fast too  
    ity alika ity ka tsy azony.  
    DEM dog DEM COMP NEG done-3  
    ‘This child can catch a dog but this dog is too fast so he wasn’t able to.’

a.  [[Ma-ha-sambotra alika io zaza io]]:  
    ∃s∀x [now ⊆ r & r ⊆ s & child(x) &  
    s: ◊∃e∃y[catch(e) & theme(y,e) & dog(y) & agent(x,e) &  
    ∃z.prevent(z,Cul(e)) &  
    ∀FCz'[prevent(z’,e) → prevent(x,z’)]]]

In words, (40)a states that there is a possible world in which the child removes whatever virtual forces that could prevent him from successfully catching a dog. In this possible world, the event culminates (the dog is caught), but the possibility operator ensures that culmination is not necessarily entailed in the real world. Against a circumstantial modal base that takes into account the inner dispositions of the child, the sentence means that the child has the ability to catch a dog.
In sum, anchoring to the time axis always leads to culmination in past and future tense sentences, because the circumstantial modal base associated with the double prevention configuration ensures that the end state is reached in all worlds in the conversational background, which includes the real world. Present tense *maha*-sentences with stative roots assert that the state holds at the speech time, while their counterparts with eventive roots shift to a general ability or dispositional reading, asserting that there is a possible world compatible with the agent’s features in which the event culminates.

Summing up, we have developed in this section an analysis that, following Phillips and Travis is grounded in the morphological complexity of *maha*-. Semantically, *ma-* and *ha-* each introduce a prevention relation, its composition leading to a double prevention configuration. With stative roots, *maha-* adds an extra argument, which gives rise to causative and enablement conceptual structures. With eventive roots, *maha-* recycles the external argument of the root, effectively identifying the affector of the higher prevent relation with the agent role of the event. Depending on the conceptual interaction of the affector and patient forces, this leads to the ‘manage to’, the unintentional or the general ability reading.

5.0 Conclusion

The literature on non-culminating accomplishments tends to focus on how to derive the absence of culmination. In Malagasy, culmination is sensitive to the voice marker. Basic AT and TT marked sentences implicate, but do not entail culmination, so non-culminating accomplishments are the default. For the morphologically complex voice marker *maha*-, we have argued that culmination arises as a side effect of its semantics. We follow Phillips (1996, 2000) and Travis (2010), who defend the morphological complexity of *maha*-. We propose that, semantically, *ma-* and *ha-* each introduce a prevention relation, its composition leading to a double prevention configuration. With stative roots, *maha-* adds an extra argument, which gives rise to causative and enablement conceptual structures. With eventive roots, *maha-* recycles the external argument of the root, effectively identifying the affector of the higher prevent relation with the agent role of the event. Depending on the conceptual interaction of the affector and patient forces, this leads to the ‘manage to’, the unintentional or the general ability reading.

Through the association of the double prevention configuration with a circumstantial base, the culminating reading of past and future sentences with eventive roots arises naturally from this approach, and so does the absence of culmination when *maha-* occurs in the present tense. Many past approaches have attempted to link *maha-* to resultativity (Rajaona 1972) or telicity (Phillips 1996, 2000; Travis 2010), but we think the more indirect link through double prevention provides a more insightful explanation of the culmination effects where they occur (and don’t occur). In addition, this paper supports the linguistic need for a more fine-grained theory of causation.

Turning now to the broader perspective, we can ask how Malagasy patterns with other languages. We will not enter into a detailed discussion here, but Malagasy is strikingly similar to Tagalog (another Austronesian language; see Dell 1983 and Kroeger 1993) as well as some of the Salish languages in terms of morphology (a dedicated marker for culmination) and
interpretation (the same cluster of “out of control” readings). Does Malagasy provide support for the Agent Control Hypothesis of Demirdache and Martin (2015)? Perhaps indirectly, given that culmination is so closely tied to the absence of agentivity. Whether the converse is true (agentivity is required for non-culmination) remains to be determined.

Looking ahead, Malagasy has other means to mark culmination (e.g. via the “passive” prefixes voa- and tafa- discussed by Travis 2010) but it remains to be seen whether these affixes can be analyzed in similar ways as maha-. We have also set aside for future research any discussion of non-culmination with the other voice markers. We refer the interested reader to Beavers and Lee (this volume) for one approach.

References
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