

## ASPECT AND MODALITY IN MALAGASY *MAHA-*\*

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The goal of this paper is to account for the syntax and semantics of the prefix *maha-* in Malagasy.<sup>1</sup> This prefix is traditionally described as having two interpretations, “abilitive”, as in (1)a and “causative” as in (1)b.

- (1) a. Mahaongotra fantsika amin' ny tanana Rabe.  
 AHA-pull.out nail with DET hand Rabe  
 ‘Rabe can pull out nails with his hands.’
- b. Mahafinaritra an' i Soa Rabe.  
 AHA-happy ACC DET Soa Rabe  
 ‘Rabe makes Soa happy.’

Previous analyses of *maha-* have treated it as involving a lexical aspectual operation: it creates a telic predicate. We argue here that *maha-* is best analyzed as a causative circumstantial modal, along the lines of proposals in the literature for the St’át’imcets “Out of Control” circumfix *ka-...-a* (Davis, Matthewson, and Rullmann 2009) and Polish Involuntary States (Rivero, Arregui, and Frackowiak 2010). The proposed typology appears in the table below.

**Table 1. Variation in circumstantial modality**

	UNIVERSAL FORCE	EXISTENTIAL FORCE
St’át’imcets “Out of Control”	√	√
Polish Involuntary States	√	x
Malagasy <i>maha-</i>	√	√

<sup>1</sup> As argued by Phillips (2000) *maha-* is morphologically complex, but for simplicity and to conform with the existing literature, we refer to it in this paper as *maha-*. The initial *m-* alternates with *n-* in the past tense and *h-* in the future tense, so we gloss it as AHA.

We begin in section 1 with some relevant background on Malagasy syntax and morphology and then turn to past analyses of *maha-* in section 2. We next provide arguments against the lexical aspect analysis (section 3) and against an analysis in terms of grammatical aspect (perfective or perfect) in section 4. In section 5, we sketch out a modal analysis and mention some remaining problems in section 6. Section 7 concludes.

## 1. Background on Malagasy

Malagasy is an Austronesian language spoken in Madagascar that has a 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 (2)a, and Theme Topic verbs have a theme subject, as in (2)b. The third voice is called Circumstantial Topic and almost any other non-core argument can be the subject (in (2)c it is an instrument).

### (2) a. Actor Topic (AT) – Subject is agent

Nanapaka ity hazo ity tamin' ny antsy i Sahondra.  
 PST.AT.cut this tree this PST.P DET 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.P DET knife this tree this  
 ‘This tree was cut by Sahondra 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 this tree this DET knife  
 ‘The knife was used by Sahondra to cut the tree.’

This voice morphology plays a key role in this paper, as we see in the next section.

## 2. Past analyses of *maha-*

### 2.1 Rajaona (1972)

Rajaona (1972) considers *maha-* within the paradigm of the other voice markers in the language. He argues that the voices described above (AT, TT, CT) are all [-resultative] but that *maha-* (and certain other prefixes) is [+resultative]. His analysis can be summarized as in the table below.

**Table 2. Voice and aspect**

	+DURATIVE	-DURATIVE
+resultative	<i>maha-</i> / roots	<i>voa-/tafa-/maha-CT</i>
-resultative	AT	TT/CT/ <i>a-</i> passive

Rajaona does not define “resultative”, but he provides an illustrative example, given in (3)a. The main verb appears in AT and the successful completion, although a conversational implicature, can be denied without contradiction.

(3) a. Nanaraka      anao aho      fa tsy      naharaka.  
 PST.AT.follow 2      1SG(NOM) C NEG PST.AHA.follow  
 ‘I followed you but I wasn’t able to.’ [Rajaona 1972:239]

b. Naharaka      anao aho      # fa tsy      afaka.  
 PST.AHA.follow 2      1SG(NOM) C NEG able  
 ‘I was able to follow you but I wasn’t able to.’

For [+resultative] *maha-*, however, the successful completion is entailed and a denial of it leads to a contradiction, as illustrated in (3)b.

## 2.2 Dez (1980)

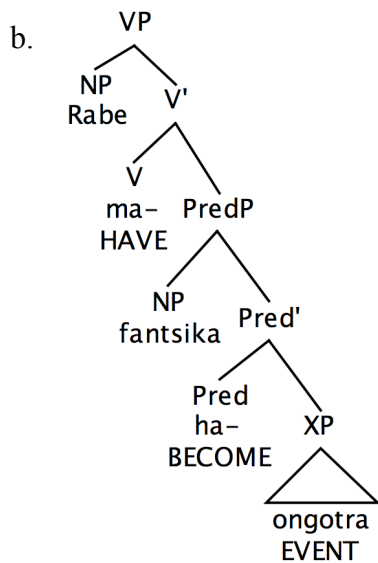
Dez (1980) draws on Rajaona’s description, but focuses instead on the abilitive and causative readings of *maha-*. He argues for a single *maha-* that has the meaning of “potentiality”. According to Dez “les dérivés en /maha/ signifient que le sujet est en possession de ce qui permet d’aboutir à la situation décrite par le radical. Ils peuvent donc être des marqueurs de potentialité”. He does not, however, address Rajaona’s [resultative] feature.

## 2.3 Phillips (1996, 2000)

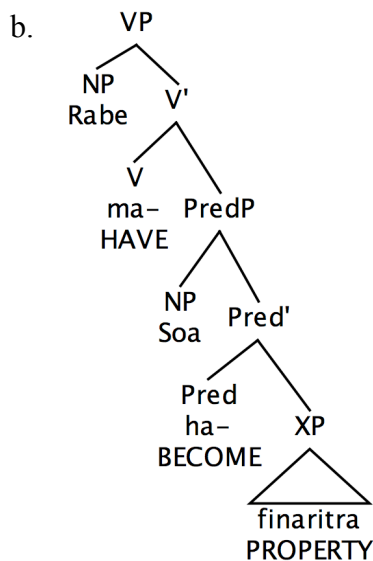
Phillips (1996, 2000) brings together the analyses of Rajaona (1972) and Dez (1980) by arguing that the interpretation of *maha-* depends on the root it attaches to. With stative roots, *maha-* verbs are causative, with eventive roots *maha-* verbs receive an abilitive reading. Moreover, *maha-* is morphologically complex: *ma-* adds an external argument and *ha* adds a BECOME operator. It is the latter element that gives rise to Rajaona’s resultativity. The structures proposed by Phillips (1996:86) are illustrated below.<sup>2</sup>

(4) a. Mahaongotra fantsika amin’ ny tanana Rabe.  
 AHA-pull.out nail with DET hand Rabe  
 ‘Rabe can pull out nails with his hands.’

<sup>2</sup> We have slightly modified Phillips’ example (4)a based on suggestions from the second author.



- (5) a. Mahafinaritra an' i Soa Rabe.  
 AHA-happy ACC DET Soa Rabe  
 'Rabe makes Soa happy.'



According to Phillips, eventive roots (such as *ongotra* 'action of pulling up') have an agent as part of their argument structure and *maha-* adds a causer that is coindexed with the agent. In this structure, the ability reading emerges. Stative roots (such as *finaritra* 'happy'), however, lack an agent and the causer is added. Here the causative reading is more salient. For Phillips, like Dez, *maha-* itself is not ambiguous. The *ha-* morpheme, as mentioned above, introduces a change of state and the resulting verb, according to Phillips (1996:81) is a stative accomplishment.

## 2.4 Travis (2010)

In her work on Inner Aspect, Travis (2010) discusses *maha-* and adopts Phillips' analysis with one modification: she argues that all *maha-* verbs are achievements.<sup>3</sup> One piece of evidence comes from the incompatibility of *maha-* verbs with agent-oriented adverbs (Piñón 1997).

- (6) a. Nanao fanahy iniana nameno tavoahangy Rakoto.  
 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.'

In sum, previous analyses have focused on the apparent ambiguity of *maha-* and on accounting for the fact that verbs prefixed with *maha-* entail the successful completion of the event. For Phillips and Travis, *maha-* is analyzed as a marker of telicity – creating an accomplishment for Phillips and an achievement for Travis. We will see in the next section some problems with this approach to *maha-*.

## 3. Not lexical aspect

We will first argue that *maha-* verbs are not accomplishments and then we turn to evidence against the achievement analysis.

### 3.1 Accomplishments

The argument against treating *maha-* as creating accomplishments comes from the interpretation of bare nouns. Malagasy nouns are number neutral ("general number") and the language has a definite determiner *ny*. As a result, bare nouns are interpreted as indefinite (novel), as illustrated below for *penina* 'a pen/some pens' and *kopy* 'a cup/some cups'.

- (7) a. Manolotra penina izy.  
 AT.offer pen 3(NOM)  
 'She offers some pen/s.'
- b. Rakofana kopy ny tsaramaso  
 TT.cover cup DET bean  
 'The bean/s are covered with some cup/s.'

If *maha-* creates accomplishments, we expect bare noun complements to *maha-* verbs to be interpreted as singular (see de Swart in press): singulars are quantized and therefore compatible with telic predicates, while indefinite plurals are cumulative and not

<sup>3</sup> As noted by Phillips (1996:Chapter 3), some *maha-* verbs are clearly achievements; for example, *mahajery* 'to notice' and *mahatadidy* 'to remember'.

compatible with telic predicates. This effect can be seen clearly in other number neutral languages, such as Japanese and Chinese, as we show below.

In Japanese when a bare noun like *matci* ‘match’ appears as the complement of a telic verb, it loses its number neutrality and must be interpreted as singular, as seen in (8)a. But if a bare noun is combined with an atelic verb, as seen in (8)b, it can be plural (see Fujimori 2005 and Yoshida 2008 for further discussion).

- (8) a. Taro-ga      matci-o              (\*gofunkan)              su-tta              [telic]  
       T.-NOM      match-ACC              for.five.minutes              strike-PAST  
       ‘Taro struck a match (\*for five minutes).’
- b. Taro-ga      yasai-o              (nijikan)              ni-ta              [atelic]  
       T.-NOM      vegetable-ACC              (for.two.hours)              boil-PAST  
       ‘Taro boiled vegetables (for two hours).’

In Chinese, the effect is slightly different. Bare noun complements of telic predicates are interpreted either as definite or as a singular specific indefinite (Sybesma 1999). Both interpretations are quantized and therefore compatible with telicity.

- (9) a. Wo              he-guan              le              tang  
       I              drink-up              ASP              soup  
       ‘I drank up the soup/a specific amount of soup/\*soup.’
- b. Wo              mai-zhao              le              shu  
       I              buy-get              ASP              book  
       ‘I managed to buy a specific book/the book(s)/\*books.’

Turning now to Malagasy, we do not expect a definite reading (there is a definite determiner in the language, so this reading will be blocked), but we do expect an effect such as the one illustrated by Japanese, where bare nouns are singular with telic predicates. As seen by the data below, this prediction is incorrect: bare nouns remain number neutral even when the complement of a *maha-* verb.

- (10) a. Nahatapaka      karoty      ny      antsy.  
       PST.AHA.cut      carrot      DET      knife  
       ‘The knife can cut carrot/s.’
- b. Nahafongana      trano      ny      fahavalo.  
       PST.AHA.destroy      house      DET      enemy  
       ‘The enemy was able to destroy house/s.’
- c. Nahahinana      karoty      Rasoaa.  
       PST.AHA.eat      carrot      Rasoaa  
       ‘Rasoaa was able to eat carrot/s.’

These examples allow the number neutral reading of the bare noun complement and the interpretation is completely natural (as compared with the English ??*Alex ate up*

*carrots*). There is also no shift to an activity reading, as is often seen in English. As a result, we must reject the accomplishment analysis of *maha-*.

### 3.2 Achievements

Recall that Travis (2010) argues that *maha-* verbs are in fact achievements. This analysis may allow us to explain the number neutrality effects seen in the preceding sub-section. As noted by Rothstein (2004), achievements, although telic, are compatible with bare plurals.

(11) The message reached listeners in an instant.

Therefore treating *maha-* verbs as achievements predicts that the number neutral reading should remain (see Rothstein 2004 for the details of the analysis for English).

It can be shown, however, that *maha-* verbs do not pattern with achievements. The data come from the distribution and interpretation of certain adverbs. First, *maha-* verbs are compatible with adverbs, such as *sasaka* ‘partway’ and *tsikelikely* ‘gradually’, that are not possible with achievements (Piñón 1997). Thus the examples in (12)a,b contrast with the achievement *maty* ‘die’ in (12)c

- (12) a. Nahaorina sasaka ny tranony io vehivavy io.  
 PST.AHA.build half DET house.3 DEM woman DEM  
 ‘This woman managed to build her house halfway.’
- b. Nahafongana trano iray tsikelikely ny fahavalo.  
 PST.AHA.destroy house one DISTR.little.little DET enemy  
 ‘The enemy managed to gradually destroy one house.’
- b. #Maty tsikelikely i Soa.  
 dead DISTR.little.little DET Soa  
 ‘Soa gradually died.’

Second, *saika* ‘almost’ allows both a counterfactual and a scalar reading, as in (13)a. This differs from achievements in both Malagasy and English, which only allow a counterfactual reading, as seen in (13)b,c.

- (13) a. Saika nahaorina trano iray io vehivavy io.  
 almost PST.AHA.build house one DEM woman DEM  
 ‘This woman almost managed to build a house.’  
 i. She changed her mind before even starting the construction.  
 ii. She started but did not complete the house.
- b. Saika nahazo loka i Be.  
 almost PST.AHA.get prize DET Be  
 ‘Be almost won a prize.’  
 i. Be didn’t win.  
 ii. #Be was in the process of winning a prize, but didn’t win.

- c. Rebecca almost reached the summit.
  - i. She didn't reach the summit at all.
  - ii. #She was in the process of reaching the summit, but didn't complete it.

Based on these data, we reject the achievement analysis of *maha-* verbs. Together with the results of the preceding sub-section, we conclude that *maha-* is not an operator on lexical aspect.

#### 4. Not grammatical aspect

We now turn to the possibility that *maha-* encodes grammatical aspect. That is, the apparent telicity is in fact either the result of perfective or perfect aspect. We will see, however, that the grammatical aspect analysis must be rejected.

##### 4.1 Perfective

Looking at the interpretation of verbs with *maha-* it is clear that it is not perfective. Perfective aspect has a number of properties not shared by *maha-*. For example, perfective aspect on stative verbs leads to an inchoative reading, but this is not the interpretation we see in Malagasy. Instead, as noted by Phillips (1996, 2000) and illustrated in (14), the interpretation is causative.

- (14) a. maha – tsara ‘make good’  
 b. maha – ratsy ‘make bad’  
 c. maha – kamo ‘make lazy’  
 d. maha – maina ‘make dry’

Second, perfective aspect is typically not compatible with a present tense interpretation. For example, in Russian, the combination of perfective and present gives rise to a future reading.

- (15) Ja napišu pis'mo.  
 I PERF.write.PRES letter  
 ‘I will write a/the letter.’

Moreover, perfective aspect gives rise to narrative progress in Russian, in contrast to imperfective aspect, which is used for background information (cf. Smith 1997). In Malagasy, however, *maha-* in the present tense receives the typical present tense interpretation.

- (16) Mahafinaritra an' i Soa Rabe.  
 AHA.happy ACC DET Soa Rabe  
 ‘Rabe makes Soa happy.’

There is no evidence that *maha-* is crucial for story telling. Thus the perfective analysis is not adequate for *maha-*.



## 4.2 Perfect

We now consider the perfect. There are some similarities between *maha-* verbs and the perfect that are worth exploring. In particular, *maha-* verbs, as argued by Phillips, convey a state and a change of state. This is much like the perfect, where there is a completed event and consequent state. Despite this similarity, *maha-* verbs do not otherwise pattern with the perfect. For example, they do not show current relevance effects (cf. #Mary has bought a car but sold it).

- (17) Nahavidy fiara Rasoa fa efa lafony.  
 PST.AHA.buy car Rasoa but already sold.3  
 ‘Rasoa was able to buy a car but she has already sold it.’

They also do not display so-called lifetime effects: (18) is acceptable in a context where Hitler has been dead for a long time (cf. #Hitler has killed himself).

- (18) Nahafaty tena i Hitler.  
 PST.AHA.dead self DET Hitler  
 ‘Hitler managed to kill himself.’

Moreover, *maha-* verbs are compatible with temporal adverbs and are not required for experiential readings, unlike the perfect. We therefore conclude that *maha-* does not encode the perfect.

Summing up, past analyses have treated *maha-* as an operation on lexical aspect. We have rejected this approach and have also shown that it is not possible to analyse *maha-* as an operation on grammatical aspect. We therefore consider a modal analysis in the next section.

## 5. Modality

There is an emerging discussion in the literature of the cross-linguistic variation in modals. In this section, we look at two circumstantial modals and compare them with Malagasy. We will show that Malagasy *maha-* patterns with a circumstantial modal in St’át’imcets in allowing both universal and existential force. The details of this analysis, however, are left for future research.

### 5.1 St’át’imcets

Davis, Matthewson, and Rullmann (2009) consider the discontinuous affix *ka-...-a* in St’át’imcets and note the range of possible meanings. On the one hand, this affix appears to allow ability and ‘manage to’ interpretations.

- (19) a. Wá7=lhkan ka-cát-s-a ta=k’ét’h=a.  
 IMPF=1SG.SUBJ CIRC-lift-CAUS-CIRC DET=rock=EXIS  
 ‘I can lift the rock.’

- b. Ka-cwák-s=kan-a                      na=wá7                      xúq'wleqs  
 CIRC-wake-CAUS=1SG.SUBJ-CIRC    DET=IMPF                      snore  
 n-snúk'wa7.  
 1SG.POSS-friend  
 'I managed to wake up my snoring friend.'

On the other hand, some instances are interpreted as meaning 'accidentally' or 'suddenly' – what is often called “out of control”.

- (20) a. Ka-lhexw-min-ts=kácw-a.  
 CIRC-come.up-RED-1SG.OBJ=2SG.SUBJ-CIRC  
 'You came up to me all of a sudden.'
- b. Ka-lhéxw-a                      ta=snéqwem=a.  
 CIRC-come.up-CIRC              DET=sun=EXIS  
 'The sun came out.'

Davis, Matthewson, and Rullmann argue that the core meaning of *ka-...-a* is circumstantial modality and that the various meanings arise due to variable force. Existential force gives rise to the ability readings and universal force accounts for the 'accidentally' readings. We refer the reader to their paper for more details.

## 5.2 Polish

Rivero, Arregui, and Frackowiak (2010) offer a novel analysis of the Polish Involuntary State Construction. Drawing on Davis, Matthewson, and Rullmann (2009), they argue that this construction, illustrated in (21), is in fact a circumstantial modal applicative.

- (21) Napisáło              mi              się              własne imię.  
 PREF.WROTE.NEU I.DAT REFL OWN              name.ACC  
 'I wrote my own name (by accident).'

They note, however, that this construction only has the 'accidentally' reading, therefore they conclude that the force is fixed as universal.

## 5.3 Back to Malagasy

Let us now reconsider the Malagasy data in light of the above proposals. We have seen that *maha-* has both an ability and 'manage to' interpretation (recall the examples in (1)). The literature does not mention 'accidentally' readings of the type in (20) and (21). The second author of this paper, however, notes that certain examples do bring out the other reading. Consider example (22), repeated from (10)c above.

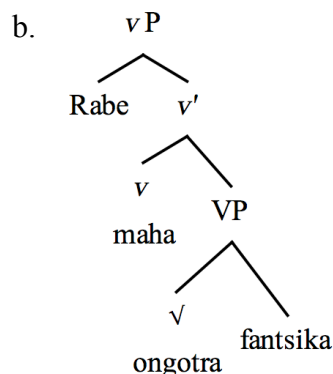
- (22) Nahahinana              karoty              Rasoá.  
 PST.AHA.eat              carrot              Rasoá  
 'Rasoá was able to eat carrot/s.'  
 'Rasoá swallowed carrots in spite of herself.'

Assuming this reading to be more widely possible than previously assumed, we conclude that *maha-* is parallel to *ka-...-a* and is a circumstantial modal that has both universal and existential force. Further fieldwork is required to determine where the ‘accidentally’ reading is available and why the ability reading appears to be more prominent.

#### 5.4 Proposed syntactic structure

Following in large part the analysis of Phillips (1996, 2000), we propose the following structure for *maha-* verbs, where *maha-* heads a *vP* and introduces a causer.

- (23) a. Mahaongotra fantsika Rabe.  
 AHA-pull.out nail Rabe  
 ‘Rabe can pull out nails.’



Recall that in Phillips’ structures, *maha-* was decomposed into two separate heads, *ma-* and *ha-*. For present purposes and until we have clear evidence for the presence of two heads, we leave *maha-* as a single head in the tree.

We note in passing that the modals in the languages discussed in this section have differing effects on argument structure, something that has not been explicitly noted in the literature. In St’át’imcets, *ka-...-a* has no effect on argument structure – it appears to attach to a range of verbal stems without adding or removing arguments. In Polish, the Involuntary State Construction adds a dative external argument (hence the analysis as an applicative). And in Malagasy, as we have seen, *maha-* adds a causer and thus we claim that *maha-* is a causative circumstantial modal morpheme.

#### 5.5 Proposed semantics

For the purposes of this paper, we set aside a formal account of *maha-*. We note that such an account would be similar to the one for St’át’imcets *ka-...-a*, with the only difference being the argument structure properties. We hope to provide a formalization in future work.

## 6. Remaining problem

The proposed analysis accounts for the argument structure properties of *maha-* (it introduces a causer) and for its interpretation (it is a circumstantial modal that has both universal and existential force). But one aspect of the interpretation remains mysterious: Rajaona's "resultativity" (interpreted as telicity by Phillips and Travis). In the literature on modality, this interpretative effect has been called an actuality entailment. Bhatt (1999) and Hacquard (2006) show that in several languages (Modern Greek, Hindi, French, and Italian), the combination of an ability modal with perfective or perfect gives rise to an actuality entailment. We note here that the Polish Involuntary State Construction does have an actuality entailment, but St'át'imcets does not, so there appears to be cross-linguistic variation (see Davis et al. 2010 for some discussion).

In Malagasy, there is an actuality entailment in the past tense with *maha-*, as illustrated below.

- (24) #Nahatsidika an' i Kanada aho nefa nitety an' i Amerika.  
 PST.AHA.visit ACC DET Can. 1SG(NOM) but PST.AT.LOC ACC DET America.  
 'I could have visited Canada but I went to America.'

In the present tense no change of state is entailed.

- (25) Mahafaty osivavy ilay amboadia fa izy mbola tsy namono fotsiny.  
 AHA.death goat DEF wolf but 3 still NEG PST.AT.kill only  
 'This wolf can kill goats but it still hasn't done so yet.'

It can be shown, however, that the past tense in Malagasy is not perfective (or perfect). For example, stative verbs are compatible with the past tense and do not undergo any shift in meaning.

- (26) Narary Rabe.  
 PST.sick Rabe  
 'Rabe was sick.'

Any formal semantic analysis of *maha-* must therefore account for the actuality entailment without recourse to such notions as perfective.

## 7. Conclusion

In this paper, we have provided a unified analysis of *maha-*, inspired by Dez (1980) and Phillips (1996, 2000). What is novel about our analysis is that we claim that *maha-* is a circumstantial modal. Existential force gives rise to ability readings and universal force, though less salient, is also possible and leads to 'accidentally' interpretations. In terms of argument structure, *maha-* adds an external argument to the root it attaches to and as a result we treat it as a causative morpheme.

This research has expanded the typology of causatives and modals. We note that modals are traditionally viewed as occurring very high in the syntactic structure, but because *maha-* is causative, it is merged low, within the verb phrase.

In future research, we hope to provide a formal semantic analysis of *maha-* that accounts for its modal properties, but also for the actuality entailments that were noted by Rajaona (1972) and led Phillips (1996, 2000) and Travis (2010) to analyse *maha-* as a marker of telicity. We will compare *maha-* with other prefixes in Malagasy that appear to encode a similar range of meanings, including *voa-* and *tafa-*. In particular, *tafa-* allows ‘accidentally’ readings. As noted by Dez (1980:83) about *tafapoaka* (of a gun that goes off by itself) “Parfois la forme en /tafa/ peut exprimer un fait accidentel, survenu extérieurement à la volonté du véritable agent”.

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