

# Expletive agreement, evidentiality, and modality in Logooli

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## 1 Introduction<sup>1</sup>

- Logooli (Luyia, Bantu) has two “expletive” agreement markers, *e-* and *ga-*.<sup>2</sup>
- These morphemes mark noun class 9 (*e-*) and noun class 6 (*ga-*) subject agreement.
  - By Bantuist convention, noun classes are glossed using numbers. Logooli has approximately 17 noun classes. They typically come in pairs, with the odd numbers being singular, and even numbers being plural. (So noun class 2 contains the plurals of noun class 1.)
- In addition to noun class subject agreement, *e-* and *ga-* occur in our consultant’s responses to English prompts with expletive (also called pleonastic) subjects, as in (1):

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<sup>2</sup>Logooli (or Luragooli, Maragoli, Lulogooli, among others) is a Bantu language in the Luyia subgroup. It’s spoken mostly in Western Kenya (around Lake Victoria) and in Tanzania by around 600,000 people (Lewis, et al. 2016). It exhibits a range of “typical” Bantu phenomena, including two tones, and a complex tense/aspect system, all of which we ignore in this handout.

- (1) a. *e-ror-ek-a ndee Sira a-gw-ε*  
 9-look-AC-FV that 1Sira 1-fall-FV  
 ‘It looks like Sira fell’
- b. *ga-ror-ek-a ndee Sira a-gw-ε*  
 6-look-AC-FV that 1Sira 1-fall-FV  
 ‘It looks like Sira fell’<sup>3</sup>

- In their “expletive” use, the markers may convey:
  - evidential-like meanings (direct vs. indirect perception)
  - general vs. restricted knowledge
  - evidence strength
  - (emotional) affectedness
  - modal force
- Even though we sometimes refer to these morphemes as marking an “expletive” subject, they clearly contribute something **semantically non-trivial**. This differs from English expletives, which are thought to be semantically vacuous.
- In this talk, we’ll look at the various differences in interpretation associated with each marker, and provide an analysis of *e-* and *ga-* in the spirit of Matthewson, et al. (2007) and Rullmann, et al. (2008) (henceforth RMD).
  - Following RMD, we propose that these morphemes are overt instantiations of choice functions that operate over the best worlds in the modal base supplied by the verb and contextually supplied ordering source.
  - The difference between *e-* and *ga-* is in the size of the subset that the choice function selects. *e-* simply picks out a (non-empty) subset of the modal base, while *ga-* necessarily picks out a non-proper (non-empty) subset.
  - In the following sections, we’ll show how this difference accounts for the various interpretations, ranging from evidential to modal, that arise in combination with different verbs and in different contexts.

<sup>3</sup>Abbreviations used in this handout include:

1-17 : class markers	COP : copula	PASS : passive	REC : reciprocal
sg/pl : singular/plural	FUT : future	POSS : possessive	REFL : reflexive
AC : anticausative	FV : final vowel	PROG : progressive	
CAUS : causative	NEG : negative	PRT : particle	

- This project is also a first pass at examining evidentiality in Bantu, a topic that is otherwise not well described or understood.

## 2 Logooli data

- The following sections report the “typical” interpretation of *e-/ga-* in combination with various classes of verbs. We discuss later how these typical interpretations can be shifted depending on other factors.

### 2.1 Indirect (*e-*) versus direct (*ga-*) perception

- In combination with verbs of perception like *kuholeka* ‘to be heard,’ *kufana* ‘to seem,’ and *kuroreka* ‘to appear,’ *e-* conveys that the speaker has indirectly perceived evidence for the truth of the embedded proposition, while *ga-* conveys that the speaker has directly perceived evidence for the truth of the proposition.<sup>4</sup>

- Consider the following pair of contexts:

- (2) Context: The speaker’s friend tells him that a party he (the friend) attended was fun. However, the speaker did not attend or overhear the party himself. The speaker can respond by saying:

a. *e-hol-ek-a kuresa vugeni vu-ar-ε vu-rahe*  
 9-hear-AC-FV like 15party 15-COP-FV 15-good  
 ‘It sounds like the party was fun’

b. # *ga-hol-ek-a kuresa vugeni vu-ar-ε vu-rahe*  
 6-hear-AC-FV like 15party 15-COP-FV 15-good  
 ‘It sounds like the party was fun’

- (3) Context: The speaker heard a loud party happening next door to his apartment. The speaker can say:

a. # *e-hol-ek-a kuresa vugeni vu-ar-ε vu-rahe*  
 9-hear-AC-FV like 15party 15-COP-FV 15-good  
 ‘It sounds like the party was fun’

<sup>4</sup>Here and in all following, we’re ignoring the different “detransitivizing” affixes that can appear in these constructions. These can include (exclusively) the anticausative *-Vk*, the passive *-w*, and the reciprocal *-an* (plus anticausative). The differences between these suffixes in the expletive constructions are not well understood.

- b. *ga-hol-ek-a kuresa vugeni vu-ar-ε vu-rahe*  
 6-hear-AC-FV like 15party 15-COP-FV 15-good  
 ‘It sounds like the party was fun’

- This contrast is maintained with other verbs of perception, e.g. *kufana* ‘to seem’:

(4) Context: It’s flu season, and Imali didn’t come to school.

- a. *e-fan-a kuresa Imali a-saal-a*  
 9-seem-FV like 1Imali 1-be.sick-FV  
 ‘It seems like Imali is sick’
- b. # *ga-fan-a kuresa Imali a-saal-a*  
 6-seem-FV like 1Imali 1-be.sick-FV  
 ‘It seems like Imali is sick’

(5) Context: You see Imali coughing and sneezing.

- a. ? *e-fan-a kuresa Imali a-saal-a*  
 9-seem-FV like 1Imali 1-be.sick-FV  
 ‘It seems like Imali is sick’
- b. *ga-fan-a kuresa Imali a-saal-a*  
 6-seem-FV like 1Imali 1-be.sick-FV  
 ‘It seems like Imali is sick’  
 Speaker comment: “(5b) (ie, with *ga-*) is only appropriate if you’re looking at Imali.”

- Our consultant noted that it’s not completely infelicitous to use (5a) in the context in (5). This is because it is also possible that Imali’s sneezing and coughing is due to allergies, rather than to sickness. Since even direct perception is still compatible with speaker doubt, the use of *e-* in this context is still available.
  - What is crucial is that the direct perception in the context (i.e, the speaker witnessing Imali sneezing and coughing) enables the speaker to use *ga-* and make the strongest claim possible, unlike in (4).
- In summary: The distinctions given in (4)–(5) suggest that the expletive agreement morphemes contribute evidential-like meanings encoding how the speaker learned the information s/he is asserting:
  - *e-* marks that the speaker has **indirect evidence** for the embedded proposition.
  - *ga-* marks that the speaker has **direct evidence** for the embedded proposition.

## 2.2 Restricted (*e-*) versus general (*ga-*) knowledge

- When combined with attitude report verbs like *kumanyeka* ‘to be known,’ *kusoverwa* ‘to be believed,’ and *kuvoleka* ‘to be said,’ *e-* conveys “restricted” or “privileged” knowledge, whereas *ga-* conveys “general” knowledge.
- Our consultant sometimes indicates this by supplementing his English glosses of his Logooli utterances with e.g. “It is **not widely/not well** known/believed/said that...” (for *e-*) and “It is **widely/well** known/believed/said that...” (for *ga-*):

- (6) a. *ga-many-ek-a ndee Kurt Cobain y-i-isuḡga*  
6-know-AC-FV that Kurt Cobain 1-REFL-kill  
‘It is (well) known that Kurt Cobain killed himself’<sup>5</sup>
- b. *e-many-ek-an-i ndee Kurt Cobain y-aremban-a na m-kari w-evε*  
9-known-AC-REC-FV that Kurt Cobain 1-argue-FV PRT 1-wife 1-POSS  
‘It is (sorta) known that Kurt Cobain argued with this wife (before he killed himself)’

- Note that to felicitously utter (6a) or (6b), the speaker need not have witnessed either the death of Kurt Cobain, or Kurt Cobain arguing with his wife. The speaker is merely relating the information that he knows, not relating how he acquired the information, in contrast with the perception verbs above.
- A similar contrast is found with *e-* and *ga-* in combination with verbs like *kuvoleka* ‘to say.’

- (7) a. *ga-vol-ek-i ndee Sira ya-yanz-a ma-ndazi*  
6-say-AC-FV that 1Sira 1-like-FV 6-mandazi  
‘It’s (widely) said that Sira likes mandazi.’
- b. *e-vol-ek-i ndee Sira ya-yanz-a ma-ndazi*  
9-say-AC-FV that 1Sira 1-like-FV 6-mandazi  
‘It’s (not widely) said that Sira likes mandazi.’

- Thus, with attitude report verbs, *e-* and *ga-* have the following contrast:
  - *e-* marks that the speaker believes the embedded proposition is **not widely known/believed/hoped/etc.**
  - *ga-* marks that the speaker believes the embedded proposition is **widely known/believed/hoped/etc.**

<sup>5</sup>Kurt Cobain was the lead singer of the ’90s band Nirvana. He was married to Courtney Love. Cobain committed suicide at what was (arguably) the height of his fame.

### 2.3 Less affectedness (*e-*) versus more affectedness (*ga-*)

- In combination with emotive factive predicates like *kurereriza* ‘to be sad,’ *kufuniza* ‘to be surprised,’ and *kugenia* ‘to be odd/strange,’ *e-* expresses that the speaker is less affected in terms of the relative emotion, while *ga-* expresses that the speaker is extremely affected in terms of the relative emotion.

(8) Context: Maina is a huge Lakers fan. If the Lakers lose a game, he can say:

- a. # *e-verer-iz-a*      *ndee Lakers va-goot-w-i*  
9-be.sad-CAUS-FV that 2Lakers 2-defeat-PASS-FV  
‘It’s sad that the Lakers lost’<sup>6</sup>
- b. *ga-verer-iz-a*      *ndee Lakers va-goot-w-i*  
6-be.sad-CAUS-FV that 2Lakers 2-defeat-PASS-FV  
‘It’s sad that the Lakers lost’

(9) Context: Sira is a casual Lakers fan. If the Lakers lose a game, he can say:

- a. *e-verer-iz-a*      *ndee Lakers va-goot-w-i*  
9-be.sad-CAUS-FV that 2Lakers 2-defeat-PASS-FV  
‘It’s sad that the Lakers lost’
- b. # *ga-verer-iz-a*      *ndee Lakers va-goot-w-i*  
6-be.sad-CAUS-FV that 2Lakers 2-defeat-PASS-FV  
‘It’s sad that the Lakers lost’

- Note that the difference has nothing to do with whether the speaker has (in)direct evidence for the proposition, or whether the information is widely known or not. Thus, this is a distinct meaning from the two previous uses.
- *e-/ga-* have the following contrasts with emotive factives:
  - *e-* signals that the speaker is **less affected** by the predicate-specific emotion.
  - *ga-* signals that the speaker is **more affected** by the predicate-specific emotion.

### 2.4 Weaker modal force (*e-*) and stronger modal force (*ga-*)

- Lastly, the two different expletives can occur with modal verbs.<sup>7</sup> The use of *e-* signals weaker modal force, whereas *ga-* signals stronger modal force.

<sup>6</sup>Literally: ‘It’s saddening that the Lakers were defeated.’

<sup>7</sup>By “modal verbs,” we mean verbs that introduce modal bases ordered according to some contextually supplied ordering source. The verb in (10)-(11), *kudukana*, is morphologically complex; it consists of *kuduka* ‘to arrive’ plus the reciprocal suffix *-an*. We have not found any “pure” modal verbs.

- Our consultant sometimes glosses his Logooli utterances with “should” (for *e-*) and “must” (for *ga-*).

(10) Context: A school-age kid is skipping school. He runs into another kid skipping school, who tells him:

a. *e-dukan-a ndee u-zi-ε m-skolu m-soom-e*  
9-arrive-FV that 2sg-go-FV in-school PART-study-FV

‘It’s required that you go to school and study’  
(‘You should go to school.’)

b. # *ga-dukan-a ndee u-zi-ε m-solu m-soom-e*  
6-arrive-FV that 2sg-go-FV in-school PRT-study-FV

‘It’s required that you go to school and study’  
(‘You must go to school.’)

(11) Context: A school-age kid is skipping school. He runs into a police officer, who tells him:

a. # *e-dukan-a ndee u-zi-ε m-skolu m-soom-e*  
9-arrive-FV that 2sg-go-FV in-school PART-study-FV

‘It’s required that you go to school and study’  
(‘You should go to school.’)

b. *ga-dukan-a ndee u-zi-ε m-solu m-soom-e*  
6-arrive-FV that 2sg-go-FV in-school PRT-study-FV

‘It’s required that you go to school and study’  
(‘You must go to school.’)

Speaker’s comment: “With *ga-*, there’s more force; you have no other choice. With *e-*, there’s a choice.”

- Thus, *e-* and *ga-* have the following contrast with modal verbs:
  - *e-* makes a **weak modal** assertion.
  - *ga-* makes a **strong modal** assertion.
- Unlike the data in the previous sections, the use of the agreement markers in (10)-(11) do not supply any information about directness or indirectness of evidence, generality of knowledge, or affectedness. Rather, these data strongly suggest that *e-* and *ga-* interact with the modal base.

## 2.5 Summary

- We summarize the typical contributions of *e-/ga-* with respect the different classes of predicates in Table 1.

	<b>Perception vbs.</b>	<b>Attitude rep vbs.</b>	<b>Emo. factives</b>	<b>Modals</b>
<i>e-</i>	indirect evid.	restricted knowledge	less affected	weak
<i>ga-</i>	direct evid.	general knowledge	more affected	strong

Table 1: Summary of the typical uses of *e-/ga-*

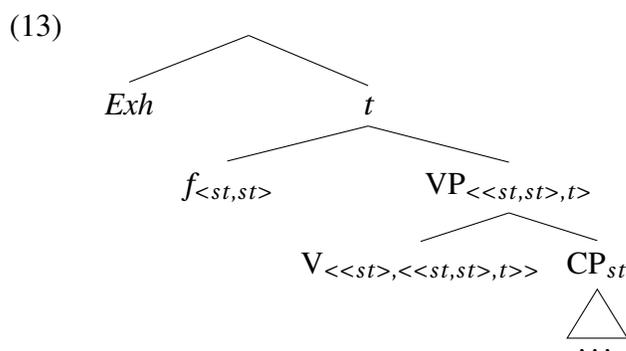
- Given the range of meanings outlined in section 2, our task now is to give a compositional semantics for the range of interpretations.

## 3 Proposal: Choice functions operating over modal bases

- We make some preliminary assumptions:
  - *e-* and *ga-* must combine with lexical items that contribute a **modal base** (ie., a set of worlds accessible from the actual world that are ordered according to some contextually supplied ordering source (Kratzer 1991, Hacquard 2011, among many others)).
    - \* That is, verbs like *kumanyeka* ‘to be known,’ *kuvoleka* ‘to be said,’ *kufana* ‘to seem like,’ and so on.

- The worlds contained within these modal bases vary based on the verb. For instance, the modal base of *kuholeka* ‘to sound like’ contains worlds that are compatible with actual auditory evidence, the modal base of *kuroreka* ‘to look (like)’ contains worlds that are compatible with actual visual evidence, and so on.
- We propose an account in the spirit of RMD’s treatment of modality and evidentiality in St’át’imcets. That is, we propose that the expletive morphemes introduce **choice functions**. These choice functions operate on the best worlds as determined by the ordering source in the modal base supplied by the verb.
  - We further assume (following RMD) that choice functions can take a set as an argument and return some subset of that set.<sup>8</sup>
  - Here, the choice function supplied by *e-* or *ga-* takes the set of the best worlds in the modal base as its argument and returns a subset of those worlds.
- Slightly more formally: The choice function  $f$  takes as input a set of possible worlds (of type  $\langle s, t \rangle$ ), and returns a subset of this set (of type  $\langle s, t \rangle$ ); that is, for all sets of possible worlds  $A$ ,  $f(A) \subseteq A$ .
- We propose a basic denotation for a Logooli modal verb in (12), with a structure given in (13) (OS = ordering source; MB = modal base; ah = attitude holder):<sup>9</sup>

$$(12) \quad \llbracket \text{MODAL VERB} \rrbracket^{w, OS, MB, ah} = \\ \lambda P_{st} \lambda f_{st, st}: OS \text{ is appropriate for MB, and for any relevant non-empty set } A, \\ f(A) \subseteq A. \quad \forall w' [w' \in f(\text{BEST}_{OS(ah, w)}(\text{MB}(ah, w))) \rightarrow P(w') = 1]$$



<sup>8</sup>Choice functions were initially proposed by Reinhart (1997) to take a set and return an element from that set. This was used to account for the interpretation of indefinite DPs.

<sup>9</sup>This is a slight simplification. Since *e-/ga-* are subject agreement markers, we actually propose that they signal agreement with a null pronominal choice function (again, similar to RMD). The issue is relevant when we consider what happens with a nominal subject, mentioned in section 4.7.

- We propose that *ga-* and *e-* return two different sizes of sets.
- *ga-* selects a **non-proper (non-empty) subset of the best worlds in the modal base**.
  - When the choice function selects all of the best worlds in the modal base, this amounts to universal quantification over the modal base, i.e., the proposition is true in all the best worlds in the modal base.
- *e-* selects a **(non-empty) subset of the best worlds in the modal base**.
  - When *e-* picks out a subset of the best worlds in the modal base, this amounts to existential quantification, i.e., there is some world in the modal base in which the proposition is true.
  - We further assume that the interpretation of *e-* is pragmatically strengthened by the application of an exhaustivity operator (*Exh*), in the spirit of Fox (2007) or Chierchia, et al. (2008).
  - Impressionistically, exhaustification operates over lexical items associated with scales. When it combines with a weak scalar item (e.g. *some*), it asserts that that item is true, and all stronger scalar alternatives to it are false (i.e., *some but not all*, where *all* is a stronger scalar alternative to *some*).
  - Slightly more formally:

(14)  $[[Exh]]^w(p) = 1$  iff  $p(w) = 1$  and for all stronger alternatives  $q$  to  $p$ :  $q(w) = 0$

- For our purposes, we assume that *ga-* is a stronger alternative to *e-*, and that there are no stronger alternatives to *ga-*.
- That is, given *Exh* application, the best worlds will have some worlds in which *P* is not true.

### 3.1 Walkthrough of an example according to our analysis

- We repeat a pair of sentences from (3):

(15) a. *ga-hol-ek-a kuresa vu-geni vu-are vu-rahe*  
 6-hear-AC-FV like 15-party 15-COP 15-good  
 ‘It sounds like the party was fun’  
 (the speaker has direct evidence that the party was fun)

- b. *e-hol-ek-a kuresa vu-geni vu-are vu-rahe*  
 9-hear-AC-FV like 15-party 15-COP 15-good  
 ‘It sounds like the party was fun’  
 (the speaker has indirect evidence that the party was fun)

- Context #1: The speaker heard a loud party happening next door to their apartment (i.e, they have direct evidence for the embedded proposition).
  - **MB**: All the worlds that are compatible with what the speaker has heard (for instance: loud music, singing, shouting, etc.).
  - **OS**: Parties with loud singing are fun. Parties with loud music are fun. Etc.
  - Given this context, the embedded proposition (*the party was fun*) is true in all of the best worlds in the speaker’s modal base (determined relative to the OS). The speaker therefore uses *ga-* to select all of these worlds.<sup>10</sup>
- Context #2: The speaker’s friend tells them that a party he (the friend) attended was fun. However, the speaker did not attend or overhear the party themselves (i.e, they have indirect evidence for the embedded proposition).
  - **MB**: All the worlds that are compatible with what the speaker’s friend has told them (for instance: there was loud music at the party, there was dancing at the party, there were a lot of people in attendance, etc.).
  - **OS**: The speaker’s friend has a different idea of fun than the speaker does (e.g. their friend enjoys loud parties, but the speaker does not). Secondhand information is generally unreliable. Etc.
  - Given this context, the best worlds in the speaker’s modal base (determined relative to the ordering source) includes worlds in which the embedded proposition (*the party was fun*) is false.
  - The speaker therefore uses *e-* to select only the subset of the best worlds in the modal base where *the party was fun* is true.

<sup>10</sup>We assume that speakers do not use *e-* in this context because they are obligated to make the strongest claim possible, given their evidence (following Grice’s maxims).

## 4 Predictions of the analysis

### 4.1 Unavailability of *e-/ga-* in combination with non-modal verbs

- If we assume that the choice function introduced by *e-/ga-* is of type  $\langle\langle s, t \rangle, \langle s, t \rangle\rangle$ , then it cannot combine with verbs that do not supply a modal base.
- This differs from the English expletive subject *it<sub>Exp</sub>*, which is able to grammatically occur in e.g. weather-*it* constructions:

(16) *It<sub>Exp</sub>* is raining outside.

- Unlike English *it<sub>Exp</sub>*, Logooli *e-* and *ga-* cannot occur in non-modal constructions:

- (17) a. *riova ri-val-a*  
 5sun 5-shine-FV  
 ‘The sun is shining’  
 (Given in response to ‘It is sunny.’)
- b. \* *{e-/ga-}val-a*  
 9-/6-shine-FV  
 Intended gloss: ‘*It<sub>Exp</sub>* is sunny.’

- We note that this data doesn’t preclude the existence of a “true” expletive in Logooli. However, we have not yet found any such item.

### 4.2 Non-speaker orientation

- In section 2.2, we described data in which the speaker uses *e-* or *ga-* to signal whether the embedded proposition is non-widely known/believed/hoped/etc. or widely known/believed/hoped/etc.
- In this case, the interpretation of the embedded proposition as widely or non-widely known is relative to the group of individuals that the speaker “associates” with (cf. Moltmann 2012).
- Because this group can vary contextually, we predict that in the right context, the speaker can (for instance) use *ga-* to report “widely known” information that the speaker themselves might not believe, or is only “widely known” in certain communities.

- (18) Context: A scientist visits a village where everyone believes that the world is flat. Although the scientist himself doesn't believe that the world is flat, and many people outside the village do not think that the world is flat, he can felicitously state:  
*ga-ganagan-ang-w-a yeeno ndee ri-lova ri-a bameka*  
 9-think-PROG-PASS-FV here that 5-world 5-COP flat  
 'It's (widely) thought here that the world is flat'

- In this context, the scientist is reporting what the “typical” villager thinks, not what he thinks, or what other people think outside of the village.

### 4.3 Variation based on background knowledge

- Since the use of *e-* versus *ga-* hinges on the best possible worlds in the speaker's modal base, changing the contents of an individual's modal base (by modifying their ordering source via their background knowledge) can change whether they will use *e-* or *ga-*.
- The following example gives a context in which two speakers must differ in their choice of *e-* versus *ga-* based purely on their background knowledge and not on perceptual information:

- (19) Context: Imali and Maina are watching Roger Federer (a tennis star) play in a tennis match. Imali is a huge tennis fan and knows all the rules and statistics. However, Maina is only vaguely familiar with the rules, and otherwise knows nothing about tennis.

- ga-ror-ek-a kuresia Federer a-kin-i vurahe karono*  
 6-look-AC-FV like 1Federer 1-play-FV well today  
 'It looks like Federer is playing well today'  
 ✓ if Imali says this, # if Maina says this
- e-ror-ek-a kuresia Federer a-kin-i vurahe karono*  
 9-look-AC-FV like 1Federer 1-play-FV well today  
 'It looks like Federer is playing well today'  
 # if Imali says this, ✓ if Maina says this

- Imali, the knowledgeable speaker, can only felicitously use *ga-*.
  - This is because her ordering source involves the rules of tennis. That is, she can accurately judge (according to these rules) whether Federer is playing well or poorly.

- She therefore uses *ga-* to make a much stronger claim.
- Maina, the less knowledgeable speaker, can only felicitously use *e-*.
  - This is because her ordering source does not involve the actual rules of tennis. That is, according to her ordering source, there are worlds in her modal base in which Federer is not actually playing well (according to the official rules).
  - She therefore uses *e-* to make a weaker claim.
- Crucially, note that both Imali and Maina have the same amount of visual information: they’re both watching the same tennis match. What differs is only the background knowledge that each speaker has.

#### 4.4 Embedding and shifting

- Evidentials have been argued to operate at the speech act level, and therefore resist embedding in many languages. Moreover, languages which permit embedded evidentials typically do not permit their interpretation to shift away from the speaker (Aikhenvald 2004).
  - We find, however, that *e-/ga-* can both **embed** and **shift**. This is predicted by our treatment of *e-* and *ga-* as choice functions over modal bases, as opposed to speech act operators.
- (20) Context: [**Speaker has direct evidence; Subject has indirect evidence.**]  
 Sira has not seen Imali, but has heard through a secondhand source that she is sick. However, the speaker has seen Imali, and he thinks that she looks sick. Sira tells the speaker that according to this secondhand source, it appears that Imali is sick. The speaker can report:
- a. *Sira a-ganagan-a ndee e-ror-ek-a ndee Imali ne mu-rwaye*  
 1Sira 1-think-FV that 9-look-AC-FV that 1Imali COP 1-sick  
 ‘Sira thinks that it appears that Imali is sick’
  - b. # *Sira a-ganagan-a ndee ga-ror-ek-a ndee Imali ne mu-rwaye*  
 1Sira 1-think-FV that 6-look-AC-FV that 1Imali COP 1-sick  
 ‘Sira thinks that it appears that Imali is sick’

- Our consultant noted that *ga-* could be felicitous in (20) if the speaker considers the source of Sira’s information to be especially reliable. The use of *e-* here reflects that Sira – not the speaker – does not consider the source to be reliable.
- (21) Context: [**Speaker has indirect evidence; Subject has direct evidence.**]  
Sira has seen Imali, and tells the speaker that he thinks that Imali looks sick. The speaker has not seen Imali. The speaker can report:
- a. # *Sira a-ganagan-a ndee e-ror-ek-a ndee Imali ne mu-rwaye*  
1Sira 1-think-FV that 9-look-AC-FV that 1Imali COP 1-sick  
‘Sira thinks that it appears that Imali is sick’
  - b. *Sira a-ganagan-a ndee ga-ror-ek-a ndee Imali ne mu-rwaye*  
1Sira 1-think-FV that 6-look-AC-FV that 1Imali COP 1-sick  
‘Sira thinks that it appears that Imali is sick’
- Crucially, when embedded under an attitude verb like *kuganagana* ‘to think,’ the choice of *e-* or *ga-* reflects the knowledge state of the local attitude holder, not of the speaker. That is, *e-* and *ga-* can shift.

#### 4.5 Continuations

- Because we treat *e-* and *ga-* has scalar terms, we predict that they should generally pattern similarly to other scalar items, for instance, in continuations: a weaker scalar term can be overtly strengthened to a strong scalar term, but the reverse cannot hold.
- (22) a. John ate **some** of the cookies, in fact, he ate **all** of the cookies.  
b. # John ate **all** of the cookie, in fact, he ate **some** of the cookies.
- We observe similar behavior with the expletives in Logooli.
- (23) a. *e-ror-ek-a ndee Sira a-ze-e naandio ga-ror-ek-a ndee Sira*  
9-look-AC-FV that 1Sira 1-go-FV in.fact 6-look-AC-FV that 1Sira  
*a-ze-e*  
1-go-FV  
‘It looks like Sira left, in fact, it (really) looks like Sira left.’
- b. # *ga-ror-ek-a ndee Sira a-ze-e naandio e-ror-ek-a ndee Sira*  
6-look-AC-FV that 1Sira 1-go-FV in.fact 9-look-AC-FV that 1Sira  
*a-ze-e*  
1-go-FV  
# ‘It (really) looks like Sira left, in fact, it looks like Sira left.’
- This is expected if *e-* is a weaker scalar item than *ga-*.

## 4.6 Challengeability

- Like RMD, we predict that the premise for assuming a certain evidence strength can be challenged in discourse. That is, a discourse participant can challenge the basis by which the speaker has established the best worlds in his/her modal base (i.e., their ordering source).
- For instance, the contribution of *ga-* can be challenged in the discourse using meta-linguistic negation:

- (24) a. Context: Sira, Kageha, and Maina are eating dinner. Sira has gotten up and left his plate on the table, and it's been a while, but he hasn't returned. Kageha, noticing Sira's now cold plate of food, says,

*e-ror-ek-a ndee Sira a-zi-e*  
9-look-AC-FV that 1Sira 1-go-FV

'It looks like Sira left.'

- b. However, Maina also notices that Sira's coat, hat, and car are gone. He says,

*yago ne agirigare daave. ga-ror-ek-a ndee Sira a-zi-e*  
10that COP 10truth NEG. 6-look-AC-FV that 1Sira 1-go-FV

'That's not true. It (really) looks like Sira left.'

- Here, Maina is claiming that Kageha has made too weak an assertion; there is in fact a lot of evidence in favor of the proposition that Sira left.
- And the converse does not hold. A *ga-* assertion cannot be challenged with *e-*.

- (25) Context: Sira's coat is not on the coatrack. Kageha thinks this means that Sira has left, because Sira always wears his coat when he leaves the house. However, Maina knows that sometimes Sira likes to wear his coat inside the house.

- a. Kageha: *ga-ror-ek-a ndee Sira a-zi-e*  
6-look-AC-FV that 1Sira 1-go-FV

Kageha: 'It (really) looks like Sira left.'

- b. Maina: # *yago ne agirigare daave. e-ror-ek-a ndee Sira a-zi-e*  
10that COP 10truth NEG. 9-look-AC-FV that 1Sira 1-go-FV

Maina: 'That's not true. It (kinda) looks like Sira left.'<sup>11</sup>

<sup>11</sup>Note also that it's not necessary that Kageha (or Maina) have seen Sira. Rather, the use of *e-/ga-* is determined based purely on what is known about Sira's general behavior.

- This pattern follows from what was discussed in the previous section: the contribution of *e-* is logically entailed by the contribution of *ga-*, because *e-* is a weaker scalar term than *ga-*.
  - That is, it’s felicitous to challenge *ga-* with *e-* because, given the assertion  $\neg\forall$ , *P* could still be true in a subset of worlds ( $\exists$ ).
  - However, it’s infelicitous to challenge *e-* with *ga-*, since  $\neg\exists$  is not compatible with  $\forall$ .
- The complication is that we have to make an assumption about the kind of negation that is being employed here.
  - Like with RMD’s data, *e-* and *ga-* always scope above clausemate negation. RMD observe that they have no independent explanation as to why this is the case. However, this observation is in accordance with cross-linguistic data on the relative scope of modals and negation, including in English (e.g. *Mary { must / should } not go to Paris*).
  - We thus must assume that the challengeability data involves meta-linguistic negation. This is an avenue for further research.

#### 4.7 Partial predication: Raising

- When the use of an expletive morpheme is precluded, the meaning is equivalent to that of *ga-*. This is predicted by our analysis: in the absence of a choice function, the meaning is simply universal quantification over the best worlds in the modal base.
- This occurs in hyper-raising/copy-raising contexts, when a referential subject appears as the subject of the main verb:<sup>12</sup>

(26) Context: You hear Imali coughing and sneezing.

- a. *Imali a-hol-ek-a kuresia ne mu-rwaye*  
 Imali 1-hear-AC-FV like COP 1-sick  
 ‘Imali sounds like she’s sick.’

<sup>12</sup>Hyper-raising is A-movement out of a finite clause (Diercks, 2012; Halpert, 2012; Carstens & Diercks, 2013). We also observe the same effect in a curious set of data involving the “modal” verbs. They can be used as main verbs in their infinitive form, and in such cases, they always have a reading compatible with universal force.

- b. *ga-hol-ek-a kuresia Imali ne mu-rwaye*  
 6-hear-AC-FV like 1Imali COP 1-sick  
 ‘It sounds like Imali is sick.’
- c. # *e-hol-ek-a kuresia Imali ne mu-rwaye*  
 9-hear-AC-FV like 1Imali COP 1-sick  
 ‘It sounds like Imali is sick.’

- This is generally consistent with our analysis because since we assume that all modals come with default universal quantification, the absence of a choice function should simply yield the meaning consistent with universal quantification.
- The additional complication comes in what saturates the  $\langle st, st \rangle$  argument of the modal verb. We assume that there’s a “true” expletive argument that saturates this slot of the modal verb, and that this expletive is equivalent to *ga-*.<sup>13</sup>
- While highly stipulative, we note that it’s generally true that universal quantification is the default, as in e.g. conditionals:

- (27) If John is in NY, Mary is in LA.  
 ≈ In all worlds in which John is in NY, Mary is in LA.

- Support for this analysis comes from dialectal variation. Mountjoy-Venning & Diercks (2016) report that for some speakers of Logooli, hyper-raising permits the *ga-* form to be used (what they refer to as “non-agreeing raising”).

- (28) *zi-ŋombe ga-ror-ek-a (ndee) zi-r-ii*  
 10-cow 6-look-AC-FV (that) 10-eat-PAST  
 ‘The cows seem to have eaten’ (M-V & D, ex. (4); their translation)

## 5 Conclusion and further puzzles

- We’ve argued that the Logooli morphemes *e-* and *ga-* introduce a choice function that combines with a universally quantified modal base and selects a subset of the best worlds of this modal base.
  - The morphemes differ in the size of the subset they select.

<sup>13</sup>Alternatively, we could stipulate that modal verbs have two lexical entries. We have no strong objections to this analysis either; both are equally stipulative.

- Their interpretation is dependent on contextual factors such as the information state of the speaker and the group of individuals that the speaker “identifies” with.
- Our Logooli data supports RMD’s analysis of modality and evidentiality in St’át’imcets, and also indirectly supports the proposal that modality and evidentiality are not distinct categories (argued by e.g. RMD, Palmer 1986, among others), arguing against a strict separation between the two (e.g. de Haan (1999)).

## 5.1 Further puzzles

- Some verbs that introduce modal bases can occur only with one of the agreement morphemes:
  - The perception verbs *kufunya* ‘to smell/to taste’ and *kuholeka* ‘to feel’ are only compatible with *e-*, not *ga-*.<sup>14</sup>
  - The emotive factive *kugaasa* ‘to be perfect’ can only combine with *ga-*.
  - The contribution of *e-/ga-* cannot scope under clausemate negation.
- Why does Logooli use the class 6 and class 9 markers for this function? Similarly, what are the facts in the other Luyia languages, and in Bantu more generally? Do other languages use different noun class markers for this function, or have a smaller/greater number of these morphemes? Finally, what is the extent of speaker/dialectal variation?

Thanks!

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<sup>14</sup>The verb *kuholeka* ‘to feel’ is homophonous with the verb for ‘to hear.’

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## 6 Appendix I: Verbs that allow both types of agreement

<b>Perception vbs</b>	kuholeka kuroreka kufaana kumanywa	'to be heard' 'to appear, look (like)' 'seem' 'to be shown'
<b>Attitude report vbs</b>	kuganagana kusovera kuvoleka kuheenzerereka kurotwa kumooniyika kuhayahayiza kumanyekana kukominyika kuyizwa	'to think' 'to believe' 'to be said' 'to be expected' 'to be dreamed' 'to be whispered' 'to be doubted' 'to be known' 'to be declared' 'to be broadcast'
<b>Emotive factives</b>	kugenya kuhangabangiza kuhogiza kwizukana kurutiza kuvereriza	'to be surprising/odd' 'to be surprising' 'to be surprising' 'to be startling' 'to be important' 'to be saddening'
<b>Modal-like vbs</b>	kwenyeka kunyareka kudoka	'to be wanted/should' 'to be possible, likely' 'to be imperative/must'

Table 2: Logooli verbs that can appear with both types of expletive agreement.